3rd meeting of the HSSC Project Team on Standards for Hydrographic Surveys (HSPT3)

12 - 15 March 2019, Wollongong, Australia

1. Welcome and Opening Remarks by Chair

The Australian Hydrographic Office (AHO), represented by Captain Stewart Dunne, welcomed the participants on behalf of Commodore Fiona Freeman. He noted the work already done by the group and the challenge for the HSPT to accomplish the task of a new edition of the S-44 Publication. He also noted the importance of standards for Australia, especially considering the transition towards subcontract work in order to fulfill the demands for safety of surveys for chart production. He highlighted the importance of the Scheme of Individual Accreditation on Level 1 and 2, "Australasian Hydrographic Surveyors Certification Panel (AHSCP), Certification Scheme" which is in the process of being resubmitted to the IBSC. Finally, he mentioned that Australia is supportive of the introduction of a Hydrographic Survey Working Group (HSWG).

2. Domestic and Administrative Arrangements

The host, Mr. Andrew Coulls (AHO), presented the administrative arrangements.

3. Introduction of Participants, Apologies and Approval of Agenda

All participants introduced themselves and provided brief details of their background and organizational interest in the HSPT work.

Apologies were received from Portugal, Peru, Canada and IHO Secretariat.

The Chair, Mr. Christophe Vrignaud, welcomed all participants and thanked them for coming to the 3rd meeting of the IHO HSSC Project Team for Hydrographic Surveys (HSPT3). He thanked the AHO for hosting the meeting and Andrew Coulls for his organization. He noted the large amount of work addressed after the last HSPT meeting. In addition, the Vice-Chair presented the Agenda and it was approved.

The Chair provided details of the meeting programme and how the Project Team (PT) was anticipated to proceed during the week. Particularly, he requested the participants to remain focused on the desired listed goals.

At the end, the Chair provided some comments and observations on the tasks set for HSPT3, these included some from the Chair of HSSC and some guidance on the way to address the tasks set, as well as from the List of Actions of the previous meeting.

The Chair highlighted his disappointment regarding the absence of an IHO Secretariat representative for HSPT3. He presented a draft statement that he intended to send to the IHO Secretariat. This proposal has been accepted by the team:

"Despite the high priority given by the HSCC and the IHO Council to the work of the HSPT, the PT strongly regretted the absence of the representative of the IHO Secretariat (despite Art 4.a / HSPT ToRs) whose role as the secretary of the PT is crucial, especially within a few months of the submission of the final report.

Should this situation persist, there is a risk that the PT will need to reconsider its schedule."

With delaying the PT schedule now may mean a longer delay overall. The core project team members are more likely to change the longer we take. And, new members may not understand why we made the decisions

we did, even with our detailed meeting notes. Therefore, there may be even further delays due to further discussion.

Furthermore, we need an outside team member for the secretariat role and it would be beneficial to have an IHO Secretariat member present during our meetings to answer any questions the PT has regarding the IHO's viewpoints and wider perspectives.

4. Review of action list from HSPT2

The Chair provided an overview of the work undertaken since HSPT1, through to HSPT2, and the inter-sessional work up to HSPT3, including the ten identified limitations of S-44 5th edition, the Questionnaire results, and the multiple revisions of the S-44 chapters. The Chair highlighted the quality of the work done by the groups working on individual chapters, by the members during the reviews and by the Coordinating Editors.

5. Review of progress on draft revision of S-44 with Coordinating Editors' comments and assessment of next actions.

Each Chapter Leader provided a brief review of the work done and the current status.

The following sub-sections present the status of the new S-44 chapters:

i. Preface (presented by the Chair):
The Chair described the rationale behind the new Preface. It presents the history of the publication S-44 as well as changes with respect to Edition 5. The Preface reminds the reader that Edition 6 is a compromise among numerous opinions.

ii. Introduction (presented by Vice-Chair):
A new introduction was recently written and had not yet been reviewed. All participants were encouraged to review this new introduction and provide some comments.

iii. Glossary (presented by AML):
Definitions were classified as being either IHO specific or VIM (*International Vocabulary of Metrology*) specific. Contentious definitions, such as Confidence Level, were debated during the inter-sessional work. In order to facilitate the interpretation of definitions, it was decided to give examples below the definitions. Definitions should also be technology agnostic. Further work on the Glossary is necessary. It will probably need to be expanded during HSPT3 – and HSPT is still in contact with the HDWG.

iv. Acronyms (presented by Chair):
This section will be reviewed when all other chapters are completed.

v. Chapter 1 - Classification of Surveys (presented by ITA):
This chapter remains more or less the same as it was.

vi. Chapter 2 – Horizontal and Vertical Positioning (presented by USA-NOAA):
This chapter has been completely rewritten. It now contains a dedicated section on Vertical Reference Systems as well as a dedicated section on Uncertainties.

vii. Chapter 3 – Depth (presented by BRA):
There are not that many changes with respect to the 5th Edition. However, there is now a substantial amount of overlap with Chapter 2 and 4. These overlaps will need to be resolved during HSPT3.

viii. Chapter 4 – Features and Nature of the Bottoms (presented by USA-NGA):

This chapter was substantially modified. References to technologies were removed (e.g. magnetometers) with respect to feature detection capability. An attempt was made to try to harmonize S-44 with S-57 and S-101. The concept of Reportable Feature was introduced in order to address the limitations of the concept of Significant Features in relation to what makes in on the charts. The term seabed and seafloor were replaced by bottom (as defined in IHO S-32) in order to address hydrographic surveys conducted in inland waters.

ix. Chapter 5 – Tides, Water Levels and Currents (presented by IXBLUE):
Chapter 5 is now in line with the latest recommendations from the IHO. The group writing this chapter maintained a liaison with the Tides, Water Level and Currents WG (TWCWG).

x. Chapter 6 – Surveys above the Vertical Chart Datum (presented by SWE):
IHO resolutions are highlighted in this chapter. Not so many comments were received. Some comments concerned the title of the chapter: "…above the Vertical Chart Datum".

xi. Chapter 7 – Metadata (presented by AUS):
The 5th Edition did not sufficiently highlight the metadata. The 6th Edition attempts to introduce a minimum set of mandatory metadata. There are now two metadata tables in the chapter. The first is for the metadata addressing the component below chart datum; the second, for the metadata addressing the component above chart datum. The group has attempted to ensure compliance with S-101.

xii. Chapter 8 – Tables and Reference Matrix (presented by USA-NGA):
Due to the absence of CAN, it was difficult to identify who should take the lead of this chapter. USA-NGA presented proposals #1 and #2 for the Matrix. It was deemed important to set standards for those attributes about which we know something.

xiii. Annex A – Guidelines for Quality Control (presented by NLD):
NLD presents Annex A as providing very broad guidelines that are technology independent. Not many comments were received. It is a short annex which focuses on procedures, personnel and equipment (while still remaining technology independent). AUS recalled that the Annexes are not part of the standard.

xiv. Annex B – Guidance on a-priori and a-posteriori Quality Control (presented by NLD):
There remain some disagreements with respect to the content of this annex.

xv. Annex C – Gridded Bathymetry Considerations (presented by USA-NAVO):
The content is both informal and very general. A lot of comments were received. Some of the information contained in the Annex is based on S-102. There is a good liaison with the S-102 PT. One question that remains is how to deal with references. Also, there remains the issue about how to deal with the definition of new terms. They could either be in the Glossary or remain in the Annex, but still with contact with HDWG.

Following the review of work done and current status, the Chair recalled his participation at HSSC9 and HSSC10. HSCC provided encouragements to the work of HSPT and highlighted the importance of the inter-sessional work.

6. Key topics for discussion, to be included whilst addressing review of draft individual chapters and during drafting breakouts.

a. Presentation of the Spreadsheet of Comments:

Both Coordinating Editors of the PT (AUS and DEU) presented the inter-sessional work since the release of S-44 Ed. 6 Draft 1.0. DEU presented a synthesis of comments received following the review of S-44 Ed. 6 Draft 1.0 by HSPT members. All comments were tracked into an Excel Spreadsheet (enclosed with this report). The synthesis demonstrated amongst other things the need for 1) clarification of concepts; 2) the

resolution of conflicting ideas; 3) the suppression of redundant information and 4) the merging of overlapping content.

b. Break-out Sessions

After the presentation, and for the following 3 days, breakout sessions were initiated to tackle specific issues regarding parts of the standard. The following sub-sections present the parts of the standard for which break-out sessions were initiated, as well as the main outcomes of the discussions:

i. Main outcomes of the group working on the Glossary:

The Glossary has been updated according to the decisions taken during the break-out sessions. The Spreadsheet was used to track the decisions taken with respect to the comments contained in the Spreadsheet. It was deemed important to add more examples to some definitions in order to simplify the understanding of their meaning. Examples are expected from FUGRO-AUS (LiDAR), EOMAP (SDB) and FUGRO-UK (acoustics). **Action Fugro-AUS, EOMAP, FUGRO-UK**. Terms used only in the Annexes will not be defined in the Glossary. One important decision is the replacement of the term *Sea floor* by *Bottom* in order to encompass the terminology used for inland water (e.g. lakes, rivers).

ii. Main outcomes of the group working on Chapters 2, 3 and 4:

Chapters 2, 3 and 4 have been updated according to the decisions taken during the break-out sessions. The Spreadsheet was used to track the decisions taken with respect to the comments contained in the Spreadsheet. Intense debates took place within the dedicated group. It was deemed necessary to merge Chapter 3 Depth with Chapter 4 Features and Nature of the Bottoms, considering that Chapter 2 Horizontal and Vertical Positioning now describes 3D rather than 2D (horizontal) positioning. The NEW Chapter 3 is now called Chapter 3 Depth, Features and Nature of the Bottom. Chapter 3 contains separate subsections for Depth, Features and Nature of the Bottom. Under the Depth subsection, the concept of bathymetric coverage is introduced. Under the *Features* subsection, Chart Disprovals are present. However concerns were raised whether this went too far into the realm of Cartography.

iii. Main outcomes of the group working on the Introduction:

As with previous edition, the new introduction emphasizes that the requirements presented in this standard are minimum requirements. It presents the Matrix as a tool to define realizations of standards. It also highlights the change to the depth dependence in the classification of orders. It was later pointed out that a mention about the importance of having qualified survey personnel was missing. This statement was present in previous editions of the standard and the IBSC emphasized the importance of this statement.

iv. Main outcomes of the group working on the Chapters 1 and 8:

The Chapters 1 and 8 have been updated according to the decisions taken during the break-out sessions. The Spreadsheet was used to track the decisions taken with respect to the comments contained in the Spreadsheet. Chapter 1 – Classification of Surveys generated a lot of debate. It was initially proposed by AHO to introduce the concept of the Matrix and example realizations within Chapter 1. This would highlight the importance of the Matrix. It was concluded that Chapter 1 was to remain mostly as it is except that it would introduce the Matrix and refer to a new Annex A for the complete methodology. An attempt was made to replace the concept of Minimum Line Spacing in order to harmonize it with that of coverage. A proposal from USA-NGA based on percentage equivalence to the present Minimum Line Spacing requirement was debated. It was initially deemed to be impractical since the natural tendency will be to convert percentage requirements into distance units.

v. Main outcomes of the group working on specific comments in the Spreadsheet (all chapters except 1, 2, 3, 4, 8):

Using all the comments received from HSPT members and gathered in the Spreadsheet, updates and corrections to S-44 Ed. 6 Draft 1.0 were made. Some comments were very relevant and accepted, others were debated and compromises were sought. Overall, no major changes were made; just slight modifications in accordance with comments. All comments about harmonization of vocabulary (“safety of navigation”, “seafloor”, etc.) will be take into consideration at the final stage of redaction (final version).

c. Key Discussions:

This section contains the main outcomes of discussions that took place among all participants. The discussions have been grouped according to themes.

i. Choice between the two proposals of the Matrix:

Two Matrix proposals had been maintained in the S-44 Ed. 6 Draft 1.0. Proposal #1 is very inclusive, contains many criteria combining both hydrographic and non-hydrographic disciplines. CAN, the leader of proposal #1, was unfortunately not present. Nevertheless, the quality of the work done by CAN was underlined by the Chair. USA-NGA/NOAA presented proposal #2. The Matrix for proposal #2 seems much more compact and thus user-friendly. There was a strong agreement that we should not set a standard for something about which we do not know anything. The Chair emphasized the point that the Matrix should be a tool with which to specify standards. In that sense, the requirements set in the S-44 should be viewed as being derived from the Matrix. Indeed, the Matrix includes at present all requirements of S-44 Ed. 5 and can be adapted to derive other hydrographic standards, potentially with other intended purposes than safety of navigation. There was general agreement in the group that the proposal #2 is more suitable and more likely to be accepted by HSCC and the hydrographic community. While the introduction of the Matrix represents a paradigm shift, proposal #2 is not as drastic a shift as proposal #1. The work done by CAN was very useful during this debate. It was highlighted that there is a real need to explain how to use the Matrix. Thus, it was agreed to introduce a new Annex A that will be dedicated on how to use the Matrix (proposal #2). USA-NOAA proposed to write a draft of this methodology for the Matrix (new Annex A), including an example of a realization, possibly Exclusive Order. **Action USA-NOAA**.

ii. Relationship with CATZOC

The Matrix addresses the limitation of the relationship between S-44 (TVU requirement) and CATZOC. Indeed, the Matrix simply states values for the depth independent (*a*) and depth dependent (*b*) coefficients without stating which formula to use. The root-sum-square formula is addressed in the text of the standard and in Table 1. Therefore, the CATZOC standard can be derived from the Matrix simply by using the *a* and *b* coefficients together with an arithmetic sum. In that sense, the CATZOC can be considered as a Matrix realization.

iii. Table 1 and Table 2

The Chair presents the proposal of splitting the Table 1 (5th Edition) into a Table 1 and a Table 2 for the 6th Edition. Table 1 will be dedicated to requirements for the component of hydrographic surveys below the chart datum while Table 2 will be dedicated to hydrographic surveys above the chart datum. This resolves the confusion with S-44 Ed. 5 that all requirements must be addressed in order to fulfil a hydrographic survey regardless if the hydrographic instructions specified a survey above and/or below the chart datum.

iv. Proposal to remove the depth dependence from S-44

The proposal to remove all depth dependence from S-44 generated some debate. The 40m limit pertains to Special Order surveys which normally need not be performed in waters deeper than 40m. The 100m limit is the transition between Order 1b and Order 2. The proposal to remove all depth dependence did not generate enough support. An alternative second proposal to change the depth dependence from 40m to 50m and from 100m to 200m in order to be in accordance with S-100 was debated. This change was preliminarily approved. However, the consequences of this change may not have been fully assessed. As the Chair pointed out, a transition from 40m to 50m will make Special Order more difficult to achieve. However, the group worked on a way to address these S-100 depth thresholds as a hint. The sentences in which these thresholds will be described need to be carefully thought out in order not to be confused with limitations.

v. Bathymetric Coverage

Discussions during HSPT3 highlighted the possible confusion with the expression *Full Seafloor Search* since it does not explicit state if this is a requirement for Depth Measurement or Feature Detection. In order to alleviate this possible confusion, the introduction of the term Bathymetric Coverage was proposed.

vi. Minimum Line Spacing

There is general agreement that the requirement for Minimum Recommended Line Spacing should be expressed differently in order to become truly technology independent. However, in order to ensure

backward compatibility, a new way of expressing this requirement should be sought. This was a very difficult task. I n the end, USA-NGA presented 3 possible options:

- Expressing the minimum line spacing as a bathymetric coverage percentage;
- Maintaining the current line spacing requirement as is;
- Introducing the bathymetric coverage percentage (option #1) while maintaining the minimum line spacing requirement (option #2).

No consensus was found during this meeting. It was suggested that each participant reflect on the 3 choices and their implications within their respective organizations during the inter-sessional work. **Action ALL**.

vii. A-priori and a-posteriori Uncertainty

This topic generated some sporadic discussions. While it was generally agreed what is meant with *a-priori* uncertainty, diverging opinions persist as to what constitutes an *a-posteriori* uncertainty and whether or not is it even feasible to calculate such uncertainty. USA-NOAA deemed it necessary to first agree about the meaning of terms before releasing drafts of S-44 to a wider audience.

7. Any Other Business

The Chair presented the proposed objectives for a future HSWG, defined during HSPT2:

- Maintenance of S-44 (including evolution of the Matrix (inputs from industry or other specialists to add or update values/parameters))
- Update and maintenance of C-13
- Maintain liaisons with DQWG and other WGs
- Translate S-44 in other languages
- Increase education on use of S-44
- Identify new systems, technologies and methodologies
- Act as focal point for industry engagement with the IHO

No comment was addressed. A draft of the ToRs for the future HSWG was also presented.

Regarding the front page of the 6th Edition, the Chair propose the creation of a "HSPT Front Page Contest": each members will have the opportunity to address a front page (from him/herself, a colleague, a friend or a relative). A vote for the best submission will take place during HSPT4. The Chair will contact HSSC to verify if such a contest is compliant with IHO procedures and regulations, and if some specifications are requested.

8. Date and venue of next meeting – HSPT4 – and intersessional activities

As proposed during HSPT2, USA-NOAA is still ready to host the next meeting. HSPT4 is scheduled for the week of the 9th of December 2019. The location of the venue is Silver Springs, USA. Date and location still need to be confirmed by NOAA. **Action USA-NOAA**.

The Chair presented his wish to present a finalized draft of S-44 Edition 6 to HSSC11 (Cape Town, South Africa). This will require intensive inter-sessional work from March to early May. During this period, the current post-meeting draft version (version 1.5) will be circulated to HSPT3 participants for review. **Action ALL**. A draft version 1.6 version will subsequently be circulated to all HSPT members for comments and approval. **Action ALL** Version 1.7 will be presented to HSSC11. The Chair was hopeful that the PT could meet this challenge. However, he reassured the PT that some delay could still be requested in order to finalize version 1.7. In other words, version 1.7 does not have to be finalized for HSSC11, and can be addressed later, in June.

9. Review of Action List

A draft list of Action Items from the meeting were reviewed and agreed. All Action Items are marked in this report and are collected together in Annex C. It should be noted that the list of action items does NOT

include tasks that are in the HSPT Work Plan. An updated list of the Action Items will be maintained on the HSPT4 web page and all those who have actions to complete should keep the IHO Secretariat and Chair informed of any progress. **Action ALL**.

It was agreed that the Chair would circulate the meeting minutes, list of action items and work plan to all participants by March 15th. **Action Chair** Participants were requested to provide any comments until March 22nd. **Action ALL**. It was intended that the final meeting report would be provided to HSSC by March 29th. **Action Chair.**

10. Closing remarks by Chair

The Chair provided an overview summary of the three days, highlighting the topics and issues which had been discussed. He noted the amount of progress achieved. He particularly thanked AHO/RAN for hosting the meeting and the excellent facilities provided. The Chair thanked everyone for coming to the meeting and for the effort and enthusiasm towards the task. He wished all participants a safe journey home and looked forward to seeing them at HSPT4. The meeting closed at 12:30 on Friday 15 March 2019.

Enclosure:

1. Comments received following the review of S-44 Ed. 6 Draft 1.0

Annexes:

A. HSPT3 – List of Participants.
B. HSPT3 – Agenda
C. HSPT3 – List of Actions
D. HSPT3 – Draft ToRs and RoPs for HSWG
E. HSPT3 – Draft Work Plan 2019-2020

ANNEXE A: List of Participants

MEMBERS			
Member State	Organization	Name	E-mail
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Ob	Geoscience Australia	Kim Picard	kim.picard@ga.gov.au

ANNEXE B: Agenda

HSPT3: 3RD MEETING OF THE IHO HSSC PROJECT TEAM ON STANDARDS FOR HYDROGRAPHIC SURVEYS (HSPT3)
Wollongong, Australia, 12 - 15 March 2019

1. Welcome and opening remarks by the Chair.

2. Domestic and administrative arrangements (Host/Secretary).

3. Introduction of participants, apologies and approval of agenda.

4. Review of action items from HSPT2.

5. Review of progress on draft revision of S-44 with Coordinating Editors' comments and assessment of next actions.

6. Breakout sessions and dedicated debriefings regarding each chapter:

PREFACE
INTRODUCTION
GLOSSARY
CHAPTER 1 – CLASSIFICATION OF SURVEYS
CHAPTER 2 - HORIZONTAL AND VERTICAL POSITIONING
CHAPTER 3 – DEPTHS
CHAPTER 4 - FEATURES AND NATURE OF THE BOTTOMS
CHAPTER 5 – TIDES, WATER LEVELS AND CURRENTS
CHAPTER 6 – SURVEYS ABOVE THE VERTICAL CHART DATUM
CHAPTER 7 – METADATA
CHAPTER 8 – TABLES AND REFERENCE MATRIX
ANNEX A: GUIDELINES FOR QUALITY CONTROL
ANNEX B: GUIDANCE ON APRIORI AND APOSTERIORY QUALITY CONTROL
ANNEX C: GRIDDED BATHYMETRY CONSIDERATIONS

7. Review of ToRs and RoPs.

8. Any other business.

9. Work Plan 2019-2020 / List of Actions.

11. Date and venue of next meeting – HSPT4 – and intersessional activities.

12. Review of Action List and draft agenda for HSPT4.

13. Closing remarks by Chair.

ANNEXE C: HSPT3 LIST OF ACTIONS – Created on 15 March 2019 – updated on 22 March 2019

Agenda Item	Subject	Status/Date	Comments	Action
HSPT3				
	HSPT3 report	22 March	Provide HSPT3 minutes to participants including list of actions and work plan	Chair/Vice-Chair/GER
	HSPT3 report	29 March	Provide feedback on HSPT3 minutes Chair/ Vice-Chair	HSPT3 Participants
	HSPT3 report	5 April	Provide finalized HSPT3 report and minute meeting to HSSC	Chair/Vice-Chair
	Chapter 2 & 3	19 April	Finalized by dedicated group – provide final version to Editors/Chair/Vice-Chair	Group leads
	Chapter 1 & 8	30 April	Finalized by dedicated group – provide final version to Editors/Chair/ Vice-Chair	Group leads
	Glossary	19 April	Provide example for dedicated definitions to Editors/Chair/ Vice-Chair	AML/FUGRO/EOMAP
	S-44 revision	2 May	Circulate version 1.6 to HSPT members for comment	Editors
	Report to HSSC11	8 May	HSSC11 meeting – Chair report HSPT works – HSWG ToR proposal – Front Page contest agreement	Chair
	HSWG	8 May	Liaise with IBSC about C-13 topic	Chair
	S-44 revision	17 May	Provide feedback on v1.6 to Editors/Chair/ Vice-Chair	All
	S-44 revision	17 May	Check version v1.6 to ensure right use of definition	AML
	S-44 revision	17 May	Check version v1.6 to ensure technology neutral	Fugro
	S-44 revision	27 May	Release final draft version (v1.7)	Editors/Chair/Vice-Chair
	S-44 revision	31 May	Propose to HSSC final draft version of the 6th Edition to circulate to all stakeholders for informal review and comments	Chair
	S-44 revision	27 Sept.	Provide feedback on final draft to HSSC/Chair	Stakeholders
	S-44 revision	31 Oct.	Generate spreadsheet with remarks/comments from Stakeholders to circulate to HSPT members	Editors/Chair

	S-44 revision	29 Nov.	Provide feedback from Stakeholders comments	Editors/Chair/Vice-Chair
	HSPT4	9 Dec.	HSPT4 – work on the last draft based on members feedback	Participants
	HSPT4	20 Dec.	Provide HSPT4 report to HSCC	Chair/IHO
	S-44 revision	Mid Feb 2020	Release last draft to all members for comments	HSPT
	S-44 revision	Mid-March 2020	Start working on 6th Ed. Based on members comments	Editors/Chair/Vice-Chair/IHO
	S-44 revision	End April	Release 6th Ed. to HSPT members, for information, based on comments	Editors/Chair/Vice-Chair/IHO
	S-44 revision	Mid-May	Proposed 6th Ed to HSSC for endorsement in IHO Council 4 (Oct. 2020)	Chair

ANNEX D: Draft ToRs and RoPs for HSWG

TERMS OF REFERENCE
OF THE
HYDROGRAPHIC SURVEYS WORKING GROUP (HSWG)

Reference: 8th meeting of the HSSC, Monaco, November 2016
9th meeting of HSSC, Canada, November 2017

1. Introduction

The International Hydrographic Organization (IHO) is an intergovernmental consultative and technical organization that was established in 1921 to support safety of navigation and the protection of the marine environment. The objectives of the IHO are:

a. Promote the use of hydrography for the safety of navigation and all other marine purposes and to raise global awareness of the importance of hydrography;

b. Improve global coverage, availability and quality of hydrographic data, information, products and services and to facilitate access to such data, information, products and services;

c. Improve global hydrographic capability, capacity, training, science and techniques;

d. Establish and enhance the development of international standards for hydrographic data, information, products, services and techniques and to achieve the greatest possible uniformity in the use of these standards;

e. Provide authoritative and timely guidance on all hydrographic matters to States and international organizations;

f. Facilitate coordination of hydrographic activities among its Member States; and

g. Enhance cooperation on hydrographic activities among States on a regional basis.

At the 5th meeting of the IHO Hydrographic Services and Standards Committee (HSSC5 meeting it was noted that after the restructuring of the HSSC Working Groups, there was not a single WG focused on hydrographic surveying. At HSSC8 a Project Team on Standards for Hydrographic Surveys (HSPT) was established to review IHO publication S-44 – *Standards for Hydrographic Surveys* – with the task of preparing a draft 6th Edition. In addition the HSPT was tasked to submit a proposal and recommendation on whether the HSPT should continue as standing working group with details of appropriate tasks for the proposed working group to undertake.

At HSSCx it was agreed that there was a need for a standing working group, a Hydrographic Surveys Working Group (HSWG), whose focus should be on all aspects related to the conduct of hydrographic surveys and the maintenance of relevant IHO publications.

2. Objective

a. To maintain IHO publication S-44 – *Standards for Hydrographic Surveys* – preparing and proposing revisions and amendments to reflect changes in the demands of hydrographic data users, particularly those pertaining to data quality and standards;

b. Maintain IHO publication C-13 – *IHO Manual on Hydrography* - to reflect current techniques, methodologies and survey systems, in particular to ensure harmonization with the standards articulated in S-44, close to IBSC;
c. Lead the translation task for S-44 and C-13 to enable their widest possible application and use;
d. Maintain close liaison and other HSSC working groups, in particular the work of the Data Quality Working Group (DQWG) and the presentation/visualization of nautical data to the maritime customer;
e. Lead the education on the use of S-44 and develop supporting documentation to articulate best practice guidance on the application of the standards contained in S-44;
f. Identify new systems, technologies and methodologies and exchange experiences, best practice and challenges amongst member states in line with the IHO objectives; and
g. Act as a focal point for industry engagement with the IHO.

3. Authority

This WG is subordinate to the HSSC. Its work is subject to HSSC approval.

4. Composition and Chairmanship

a) The HSWG shall comprise representatives of IHO MS, Expert Contributors (EC), observers from accredited non-governmental international organizations (NGIO), and a representative of the IHO Secretariat. A membership list shall be maintained and posted on the IHO website.

b) EC membership is open to entities and organizations that can provide a relevant and constructive contribution to the work of the HSWG.

c) The Chair and Vice-Chair shall be a representative of a MS. The election of the Chair and Vice-Chair shall be decided at the first meeting after each Assembly and shall be determined by vote of the Members present and voting.

d) If a Secretary is required it should normally be drawn from a Member of the HSWG.

e) If the Chair is unable to carry out the duties of the office, the Vice-Chair shall assume the Chair with the same powers and duties.

f) ECs shall seek approval of membership from the Chair.

g) EC membership may be withdrawn in the event that a majority of the Members represented in the HSWG agrees that an EC's continued participation is irrelevant or unconstructive to the work of the HSWG.

h) All Members shall inform the Chair in advance of their intention to attend meetings of the HSWG.

i) In the event that a large number of EC Members seek to attend a meeting, the Chair may restrict attendance by inviting ECs to act through one or more collective representatives.

5. Procedures

a) The HSWG should work by correspondence, teleconferences, group meetings, workshops or symposia. The HSWG should meet about once a year. When meetings are scheduled, and in order to allow any HSWG submissions and reports to be submitted to HSSC on time, HSWG meetings should not normally occur later than nine weeks before a meeting of the HSSC.

b) Decisions should generally be made by consensus. If votes are required on issues or to endorse proposals presented to the HSWG, only Members may cast a vote. Votes at meetings shall be on the basis of one vote per Member represented at the meeting. Votes by correspondence shall be on the basis of one vote per Member represented in the HSWG.

c) The HSWG should liaise with other IHO bodies, international organizations and industry to ensure the relevance of its work and timely notice of changes to the standards.

d) The HSWG should report to HSSC on its activities and submit a rolling two-year work plan, including expected time frame.

ANNEXE E: STANDARDS for HYDROGRAPHIC SURVEYS PROJECT TEAM (HS PT) WORK PLAN 2019-2020
Tasks

A	Review the existing edition of S-44 (5th edition) and identify any deficiencies in either the standards or explanatory content.
B	Identify Orders of Surveys (in terms of horizontal and vertical uncertainty requirements, feature detection requirements, and statistical confidence levels), which are required to meet certain user requirements, noting that user requirements include, but are not limited to, the differing levels of CATZOC (S-57) / Quality of Bathymetric Data (S-10X).
C	Define, if and as appropriate, a relationship between survey orders in the IHO S-44 Publication and CATZOC used in S-57 ENC and Quality of Bathymetric Data in S-101 ENC.
D	Following review, update the content and structure of S-44 to the extent identified during the review, with the intention of publishing revisions as a sixth edition of S-44.
E	Identify any other emergent requirements not addressed within the scope of tasks A to D, and develop a proposal and recommendations on whether the Hydrographic Survey Project Team should close, continue working on specific tasks, or be migrated to a standing Working Group with an expanded Work Plan.
F	On completion of publication of a sixth edition of S-44, submit a proposal and recommendation to HSSC on whether the Project Team should continue as a standing Working Group and, if so, what tasks have been identified to justify transition to a standing Working Group.

Work item	Title	**Priority** H-high M-medium L-low	Next milestone	Start Date	End Date	**Status** P-planned O-ongoing C-completed S-Superseded	Contact Person(s)	Related Pubs / Standard	Remarks
A-1	Review the existing edition of S-44 (5th edition) and identify any deficiencies in either the standards or explanatory content.	H	HSSC 9	2016	2017	P O C	Chair	S-44 Edition 5	
B-1	Identify Orders of Surveys (in terms of horizontal and vertical uncertainty requirements, feature detection requirements, and statistical confidence levels), which are required to meet certain user requirements, noting that user requirements include, but are not limited to, the differing levels of CATZOC (S-57) / Quality of Bathymetric Data (S-10X).	H	HSSC ~~10~~ 11	2017	2018 2019	~~P~~ O O	Chair / MS	S-44 Edition 5 S-57	

Work item	Title	**Priority** H-high M-medium L-low	Next milestone	Start Date	End Date	**Status** P-planned O-ongoing C-completed S-Superseded	Contact Person(s)	Related Pubs / Standard	Remarks
C-1	Define, if and as appropriate, a relationship between survey orders in the IHO S-44 Publication and CATZOC used in S-57 ENC and Quality of Bathymetric Data in S-101 ENC.	M	HSSC ~~9, 10 &~~ 11	2017 2018	2018 2019	~~P~~ O C	MS / Experts	S-44 Edition 5 S-57 S-101	
C-2	Define, if and as appropriate, a relationship between survey orders in the IHO S-44 Publication and S-5 in order to mitigate the human element factor.	M	HSSC ~~9, 10 &~~ 11	2017 2018	2018 2019	~~P~~ O O	MS / Experts	S-44 Edition 5 S-5	
D.1	Following review, update the content and structure of S-44 to the extent identified during the review, with the intention of publishing revisions as a sixth edition of S-44.	H	HSSC ~~10~~ 11	2018	2019	P O	MS / Experts / IHO Bodies	S-44 Edition 5	
E-1	Identify any other emergent requirements not addressed within the scope of tasks A to D, and develop a proposal and recommendations on whether the Hydrographic Survey Project Team should close, continue working on specific tasks, or be migrated to a standing Working Group with an expanded Work plan.	H	HSSC ~~10~~ 11	2018	2019	P O C	Chair / MS	C-13	

Work item	Title	**Priority** H-high M-medium L-low	Next milestone	Start Date	End Date	**Status** P-planned O-ongoing C-completed S-Superseded	Contact Person(s)	Related Pubs / Standard	Remarks
F-1	On completion of publication of a sixth edition of S-44, submit a proposal and recommendation to HSSC on whether the Project Team should continue as a standing Working Group and, if so, what tasks have been identified to justify transition to a standing Working Group.	H	HSSC ~~9, 10~~, 11	2017	2019	P O C	MS/HSSC Bodies	C-13	
G-2	Start the discussion on the way forward. Presenting a TOR & ROC to HSSC	H	HSSC ~~10 &~~ 11	2018	2019 2020	~~P~~ O 0	MS/HSSC		

Meetings

Date	**Location**	**Activity**
20-22 June 2017	Paris, France	HSPT1
3-6 July 2018	Niterói, Brazil	HSPT2
12-15 March 2019	Wollongong, Australia	HSPT3
tbc	Silver Springs, Maryland, USA	HSPT4

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