

# Hydrographic Services and Standards Committee

## Hydrographic Surveys Project Team (work in progress – Dec. 2019)

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# HSPT Term of References

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→ HSPT was created in March 2017 – Extract from the Terms Of References:

## 2. Objective

To maintain IHO standards which apply to hydrographic surveys: to prepare a draft 6<sup>th</sup> Edition of IHO publication S-44 - *Standards for Hydrographic Surveys* for approval by IHO Member States (MS).

When undertaking this task the Project Team (PT) should consider, as a minimum, the following matters, in support of safety of navigation data products and services:

- (i) Review the existing edition of S-44 (5<sup>th</sup> edition) and identify any deficiencies in either the standards or explanatory content;
- (ii) 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 6<sup>th</sup> edition of S-44;
- (iii) On completion of publication of a 6<sup>th</sup> edition of S-44, submit a proposal and recommendation to the Hydrographic Services and Standards Committee (HSSC) on whether the PT should continue as a standing working group and, if so, what tasks have been identified to justify transition to a standing working group.



# HSPT1 achievements

First meeting in Paris (kick-off, **June 2017**)

→ 10 limitations on the S-44 have been stressed

→ Online Questionnaire on S-44 (published from Sept. to Nov. 2017 – Result [Web-Link](#))

→ Preliminary work done on “Table1 / Matrix” alternatives

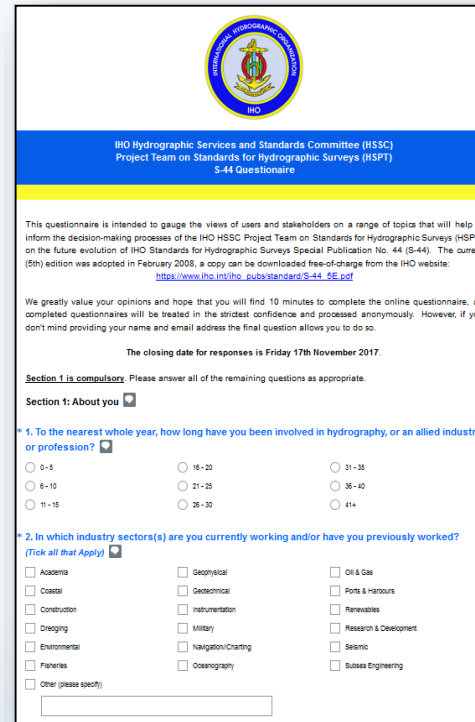


# HSPT1 achievements: The questionnaire

From mid-August to the end of November 2017

- 38 Questions
- 500 replies
- Responses were received from all over the world

→ Results statistically relevant!



The screenshot shows the HSPT1 questionnaire form. At the top is the IHO logo. Below it, the text reads: "IHO Hydrographic Services and Standards Committee (HSSC) Project Team on Standards for Hydrographic Surveys (HSPT) S-44 Questionnaire". The form includes an introduction paragraph, a closing date of Friday 17th November 2017, and two sections of questions. Section 1 is compulsory and asks about the respondent's involvement in hydrography. Section 2 asks about industry sectors. The form is titled "Section 1: About you" and "Section 2: In which industry sector(s) are you currently working and/or have you previously worked?".

**IHO Hydrographic Services and Standards Committee (HSSC)**  
**Project Team on Standards for Hydrographic Surveys (HSPT)**  
**S-44 Questionnaire**

This questionnaire is intended to gauge the views of users and stakeholders on a range of topics that will help to inform the decision-making processes of the IHO HSSC Project Team on Standards for Hydrographic Surveys (HSPT) on the future evolution of IHO Standards for Hydrographic Surveys Special Publication No. 44 (S-44). The current (5th) edition was adopted in February 2008; a copy can be downloaded free-of-charge from the IHO website: [https://www.iho.int/iho\\_pubs/Standard/S-44\\_S5.pdf](https://www.iho.int/iho_pubs/Standard/S-44_S5.pdf)

We greatly value your opinions and hope that you will find 10 minutes to complete the online questionnaire, all completed questionnaires will be treated in the strictest confidence and processed anonymously. However, if you don't mind providing your name and email address the final question allows you to do so.

The closing date for responses is Friday 17th November 2017.

**Section 1 is compulsory** Please answer all of the remaining questions as appropriate.

**Section 1: About you** ☒

\* 1. To the nearest whole year, how long have you been involved in hydrography, or an allied industry or profession? ☒

☐ 0-5 ☐ 16-20 ☐ 21-25  
☐ 6-10 ☐ 21-25 ☐ 26-30  
☐ 11-15 ☐ 26-30 ☐ 41+

\* 2. In which industry sector(s) are you currently working and/or have you previously worked? (Tick all that Apply) ☒

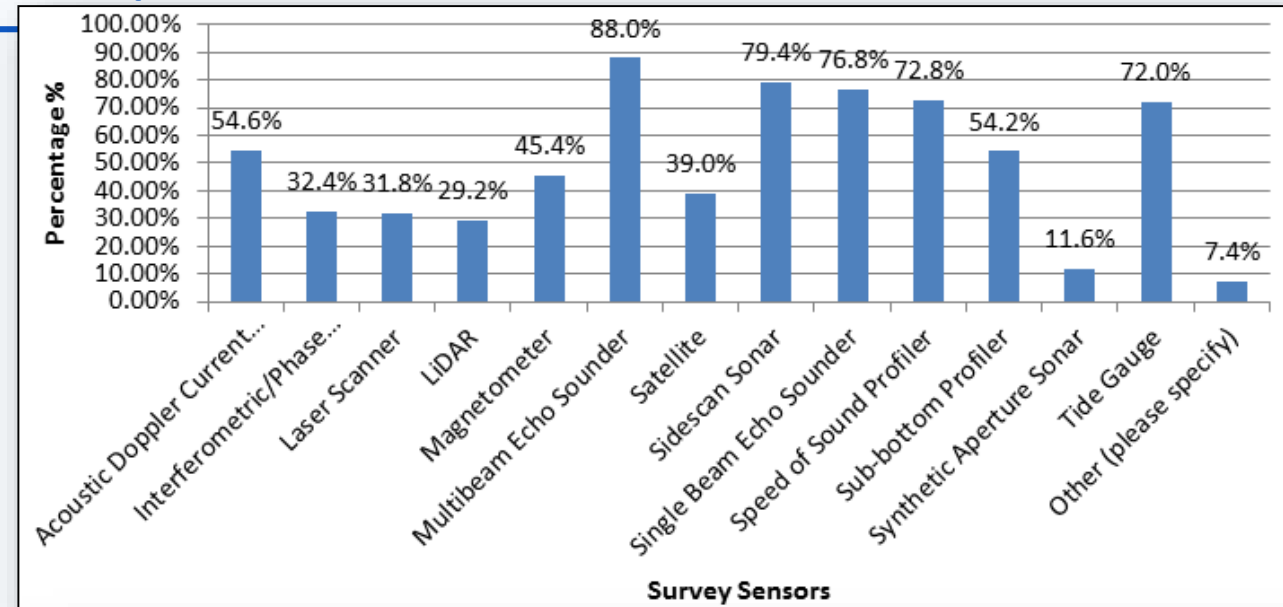
<input type="checkbox"/> Academia	<input type="checkbox"/> Geophysical	<input type="checkbox"/> Oil & Gas
<input type="checkbox"/> Coastal	<input type="checkbox"/> Geotechnical	<input type="checkbox"/> Ports & Harbours
<input type="checkbox"/> Construction	<input type="checkbox"/> Instrumentation	<input type="checkbox"/> Renewables
<input type="checkbox"/> Dredging	<input type="checkbox"/> Military	<input type="checkbox"/> Research & Development
<input type="checkbox"/> Environmental	<input type="checkbox"/> Navigation/Charting	<input type="checkbox"/> Seismic
<input type="checkbox"/> Fisheries	<input type="checkbox"/> Oceanography	<input type="checkbox"/> Subsea Engineering
<input type="checkbox"/> Other (please specify)		



# HSPT1 achievements: The questionnaire

- Q10 “Survey Sensors Utilised”

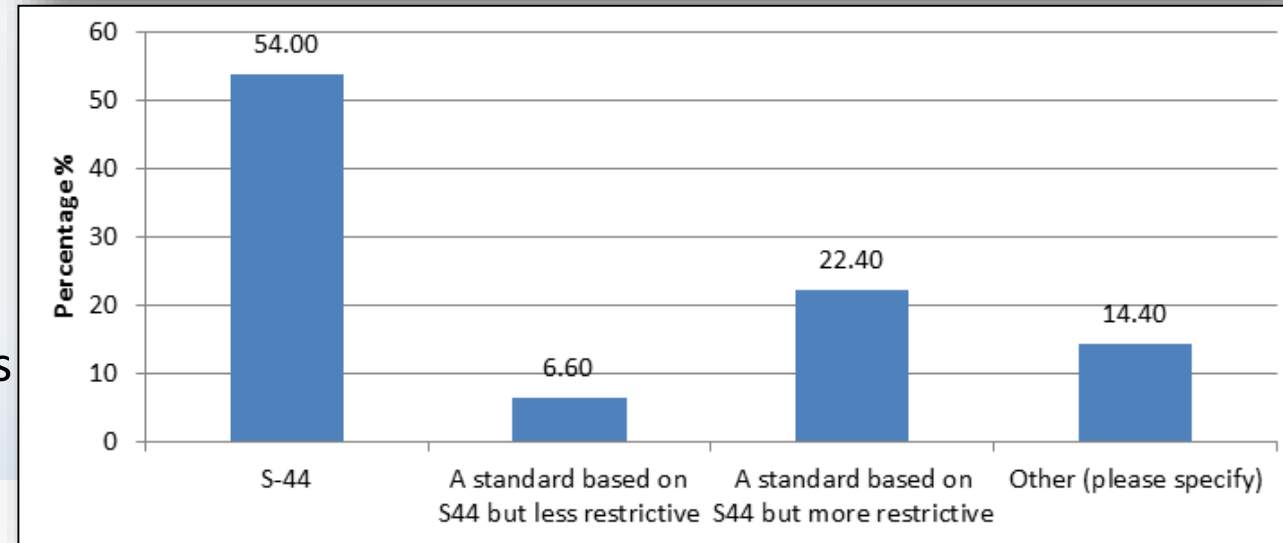
Multibeam Echosounder is the main sensor used by respondents.



- Q12 “Documented Standard?”

A large majority of the surveys are based on a documented standard (81.3%).

Of those, 54% use S-44, 22.4% use a standard more restrictive based on S-44 and 6.6% use a standard less restrictive based on S44

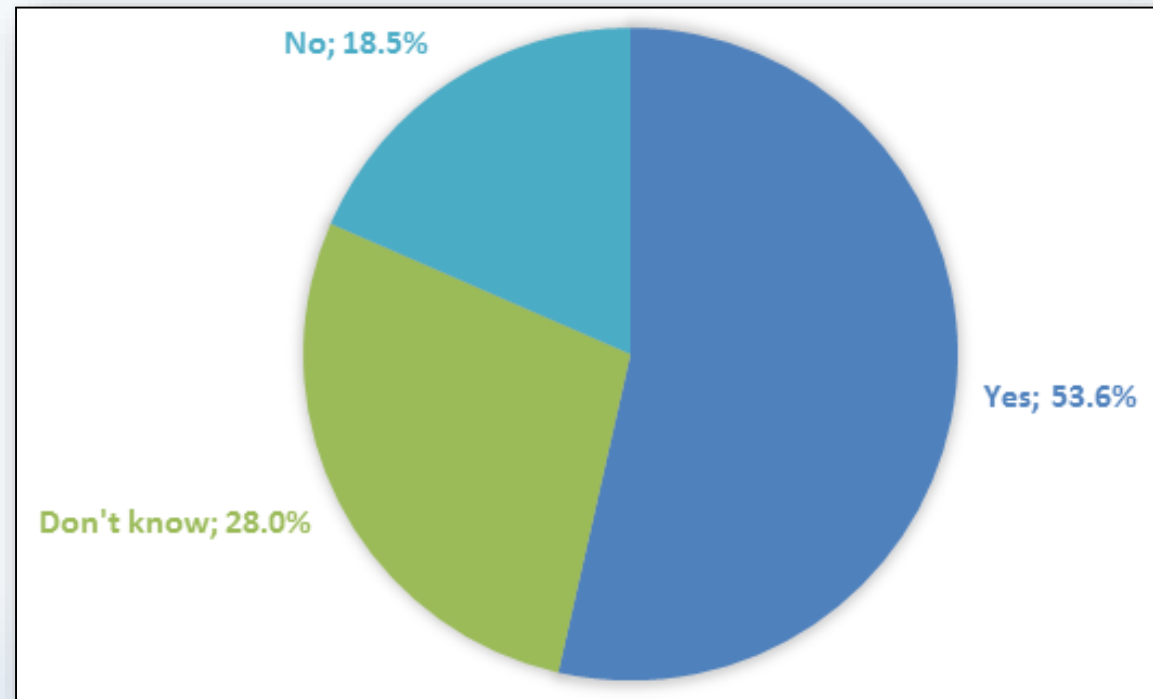


# HSPT1 achievements: The questionnaire

- Q15, Q17, Q19: “S-44 relevant and Sufficiently Strict?”

**IHO recognised survey criteria would benefit for 86.1% of the respondents  
And 83.5% consider S-44 Edition 5 is relevant to them.**

Furthermore, regarding the exclusive purpose of safety of navigation, the majority consider S-44 as sufficiently strict (53.5%).

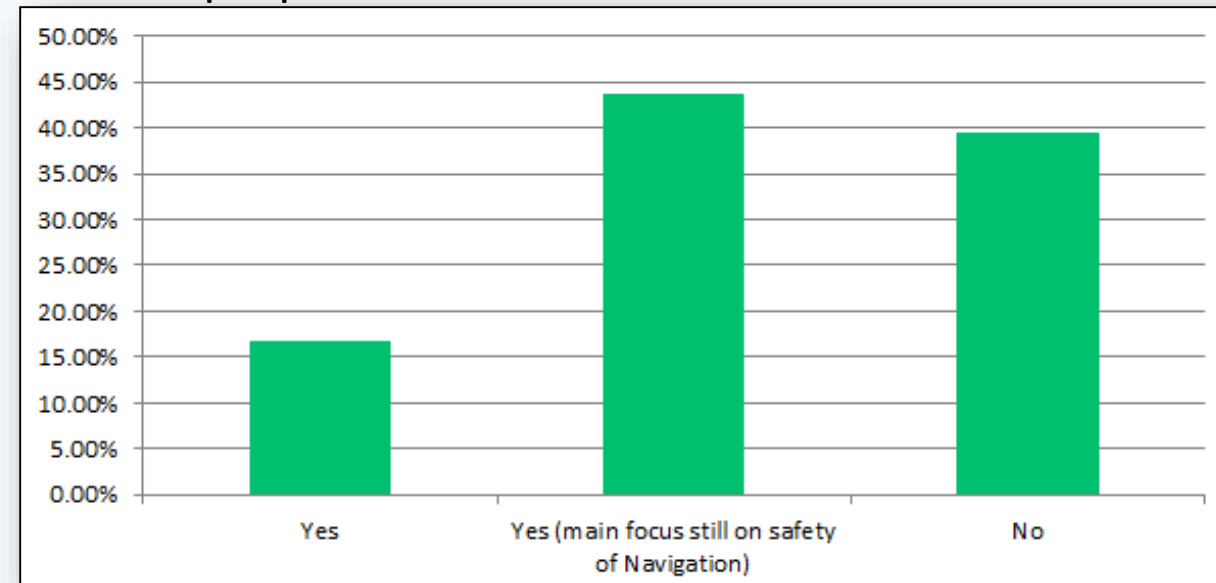




# Principal achievements: The questionnaire

- Questionnaire Results: “S-44 extended to other purposes” (Q25)

A majority (60.8%) consider S-44 should be extended for other purposes and includes 43.6% who think the S-44 focus must be safety of navigation.



- Q20: “Which part(s) of S-44 do you find most useful?”

Table 1 x59 / Chapter 1 (Classification of Survey) x18 / TVU x14 /  
Depth and Position Accuracies x14



# HSPT2 achievements



2<sup>nd</sup> meeting of HSSC Project Team on Standards for Hydrographic Surveys (HSPT2) in Niterói, Brazil, 3<sup>rd</sup> to 6<sup>th</sup> July 2018



## Second meeting (July 2018)

- Definition of a new table of content for S-44
- Dedicated subgroup for each new chapter
- First draft of each chapter started during the meeting
- First **HSWG** considerations





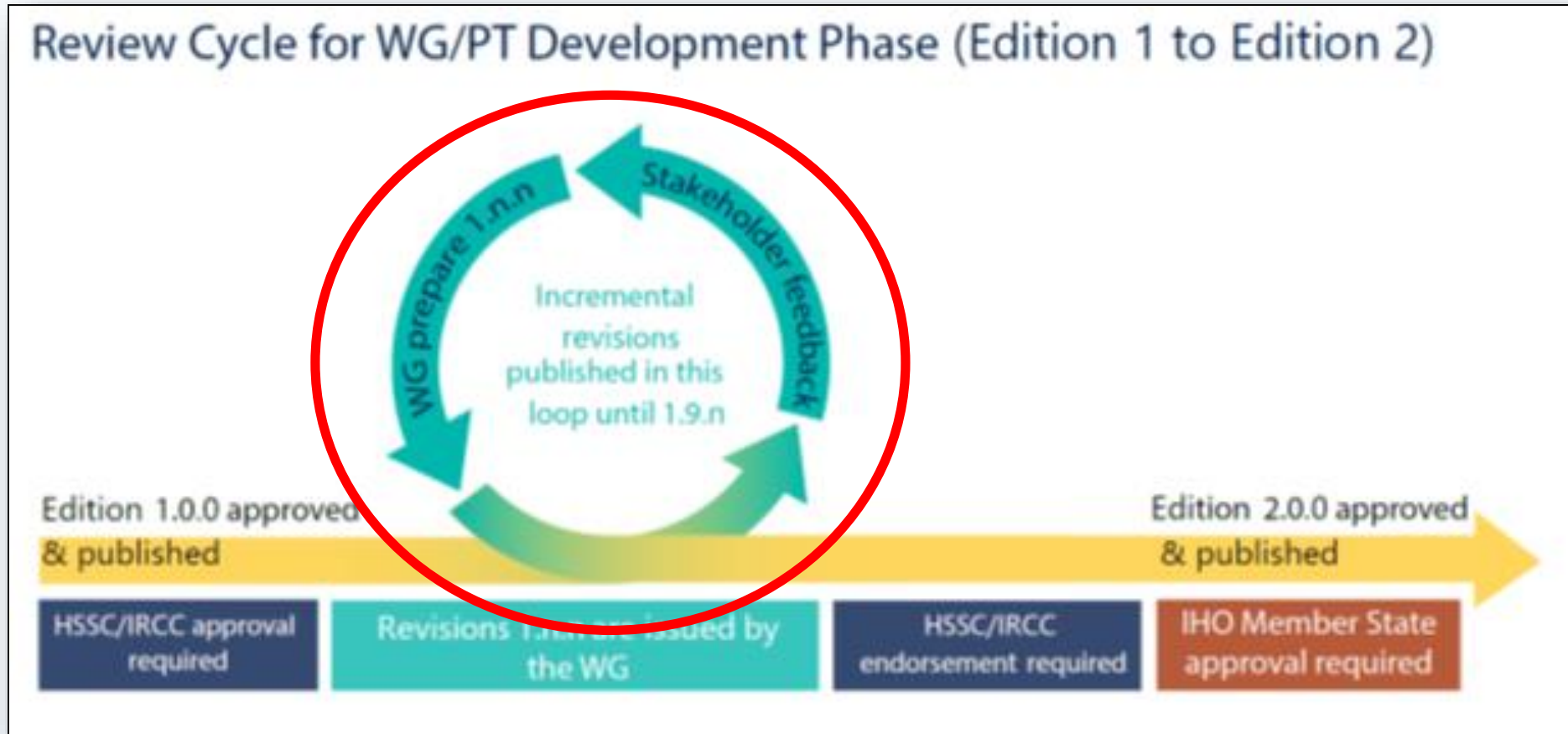
# Intersessional work achievements



- **September 2018:** 1<sup>st</sup> version of Chapters released  
+ HSPT Members feedbacks
- **November 2018:** 2<sup>d</sup> version of Chapters released  
+ HSPT members feedbacks
- **End of December 2018:** 3<sup>d</sup> version of Chapters released
- **Beginning of 2019:** All chapters merged in a complete 6<sup>th</sup> Edition Draft v1.0.0
- **End of February 2019:** HSPT members feedbacks



# Resolution 2/2007 - amended



# HSPT3 achievements

Third meeting (**March 2019**)

**Work on draft v1.0 - 6<sup>th</sup> Edition:**

- Based on HSPT members comments
- Based on Questionnaire Results

**End of HSPT3:**

- Release consolidated v1.5.0 – 6<sup>th</sup> Edition
- Draft ToR of the future HSWG



3<sup>rd</sup> meeting of HSSC Project Team on Standards for Hydrographic Surveys (HSPT3) in Wollongong, Australia, 12<sup>th</sup> to 15<sup>th</sup> March 2019

# Intersessional work achievements

**March to July 2019 :**

- loops for chapters, and comments from all HSPT
- Consolidated draft v1.7.0 released
- Call for comments to IHO stakeholders

**End of October 2019 :**

- 15 comments received from IHO stakeholders (US, UK, Italy, Japan, Finland, Sweden, France, Netherlands, Chile, Germany, Hamburg Port Authority, Australia, South Africa, Brazil, “Industry”)



# HSPT3 – 6<sup>th</sup> Edition – v1.7

## 6<sup>th</sup> vs 5<sup>th</sup> Edition:

- New table of content (all chapters updated)
- Table 1 “Orders” classification remain the same (except “line spacing” and “Bathymetric coverage” criteria)
- Identified limitations taken into account (ex: VIM/GUM compliancy, links with IHO S-32, Techno agnostic...)
- Table 2 dedicated to Aids to navigation (compliant with S-101) + current consideration

IHO STANDARDS FOR HYDROGRAPHIC SURVEYS (S-44)  
6<sup>th</sup> Edition draft 1.7.0 July 2019

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## 7.4 TABLE 1

Minimum Bathymetry Standards for Safety of Navigation Hydrographic Surveys (*to be read in conjunction with the full text set out in this document*).

Reference	Parameter Order	2	1b	1a	Special
<a href="#">Chapter 1</a> , Note 1	<b>Area description</b> (Generally)	Areas where a general description of the sea floor is considered adequate.	Areas where under-keel clearance is not considered to be an issue for the type of surface shipping expected to transit the area.	Areas where under-keel clearance is less critical but <i>features</i> of concern to surface shipping may exist.	Areas where under-keel clearance is critical
<a href="#">Chapter 2.3</a>	<b>Depth THU</b> Constant [m] + Variable [% of Depth]	20 metres + 10% of depth <i>*(Ba5,Bb2)</i>	5 metres + 5% of depth <i>*(Ba8,Bb3)</i>	5 metres + 5% of depth <i>*(Ba8,Bb3)</i>	2 metres + 0% <i>*(Ba9)</i>
<a href="#">Chapter 3.2</a> , Note 2	<b>Depth TVU</b> Constant (a) [m] Variable (b) [% of depth]	a = 1.0 metres b = 2.3 <i>*(Bc7,Bd4)</i>	a = 0.5 metres b = 1.3 <i>*(Bc8,Bd6)</i>	a = 0.5 metres b = 1.3 <i>*(Bc8,Bd6)</i>	a = 0.25 metres b = 0.75 <i>*(Bc10,Bd8)</i>
<a href="#">Chapter 3.4</a> , Note 3	<b>Feature search</b> Depths may not be produced / derived (e.g. SSS, MBES) [%]	Not Applicable	Not Applicable	100% <i>*(Be9)</i>	100% <i>*(Be9)</i>
<a href="#">Chapter 3.3</a> , Note 4	<b>Bathymetric Coverage</b> Depths produced / derived (e.g. MBES, SBES) [%]	4% <i>*(Bf2)</i>	5% <i>*(Bf3)</i>	100% <i>*(Bf9)</i>	100% <i>*(Bf9)</i>
<a href="#">Chapter 3.4.1</a> , Note 5	<b>Feature Detection</b> (System Capability) Constant [m] or Variable [% of Depth]	Not Applicable	Not Applicable	Cubic <i>features</i> > 2 metres, in depths up to 50 metres; 10% of depth beyond 50 metres <i>*(Bg5,Bh3 beyond 50m)</i>	Cubic <i>features</i> > 1 metre <i>*(Bg6)</i>

### Brief Notes:

(See detailed notes below)

Uncertainties at 95% confidence level

THU = Total Horizontal Uncertainty

TVU = Total Vertical Uncertainty

m = metres

kn = knots

deg = degrees

SSS = Sidescan sonar

MBES = Multibeam Echosounder

SBES = Single Beam Echosounder

\* = Matrix cell reference





## 7.5 TABLE 2

Other Minimum Positioning Standards for Safety of Navigation Surveys (*to be read in conjunction with the full text set out in this document*).

Reference	Data Type	2		1b		1a		Special	
		THU	TVU	THU	TVU	THU	TVU	THU	TVU
<a href="#">Chapter 5</a> , Note 6	<b>Fixed Aids, Features Significant to Navigation</b> [m]	5 *(Pa4)	2 *(Pb2)	2 *(Pa6)	2 *(Pb2)	2 *(Pa6)	1 *(Pb3)	2 *(Pa6)	0.5 *(Pb4)
<a href="#">Chapter 5</a> , Note 6	<b>Floating Aids to Navigation</b> [m]	20 *(Pc2)	---	10 *(Pc3)	---	10 *(Pc3)	---	10 *(Pc3)	---
<a href="#">Chapter 5</a> , Note 6	<b>Natural Coastline</b> (high and low water lines) [m]	20 *(Pd1)	---	10 *(Pd2)	---	10 *(Pd2)	---	10 *(Pd2)	---
<a href="#">Chapter 5</a> , Note 6	<b>Features</b> (above surface not significant to navigation) [m]	20 *(Pe1)	3 *(Pf1)	20 *(Pe1)	2 *(Pf2)	20 *(Pe1)	1 *(Pf3)	10 *(Pe2)	0.5 *(Pf4)
Note 6	<b>Overhead clearances and Range line, Sector Light Heights</b> [m]	10 *(Pg1)	3 *(Ph1)	10 *(Pg1)	2 *(Ph2)	5 *(Pg2)	1 *(Pa3)	2 *(Pg3)	0.5 *(Ph4)
Note 6	<b>Angular</b> Including range line, sector light limit azimuths THU [deg]	0.5 *(Pi4)							
<a href="#">Chapter 4.5</a> Note 7	<b>Tidal Stream and Current Direction</b> THU [deg]	10 *(Ta1)							
<a href="#">Chapter 4.5</a> Note 7	<b>Tidal Stream and Current Speed</b> Uncertainty [knts]	0.1 *(Tb5)							

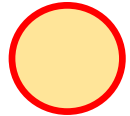


## **The Matrix approach:**

- maintains the core philosophy of S-44 concept
- A wish to open the S-44 to all the Hydrographic community (not only for “safety of navigation”)
- allows expansion and future growth (list of criteria or specification)
- backward compatibility (cells dedicated for S-44 5<sup>th</sup> Edition)
- many realizations possible from the Matrix (CATZOC, LINZ, Exclusive Order...)

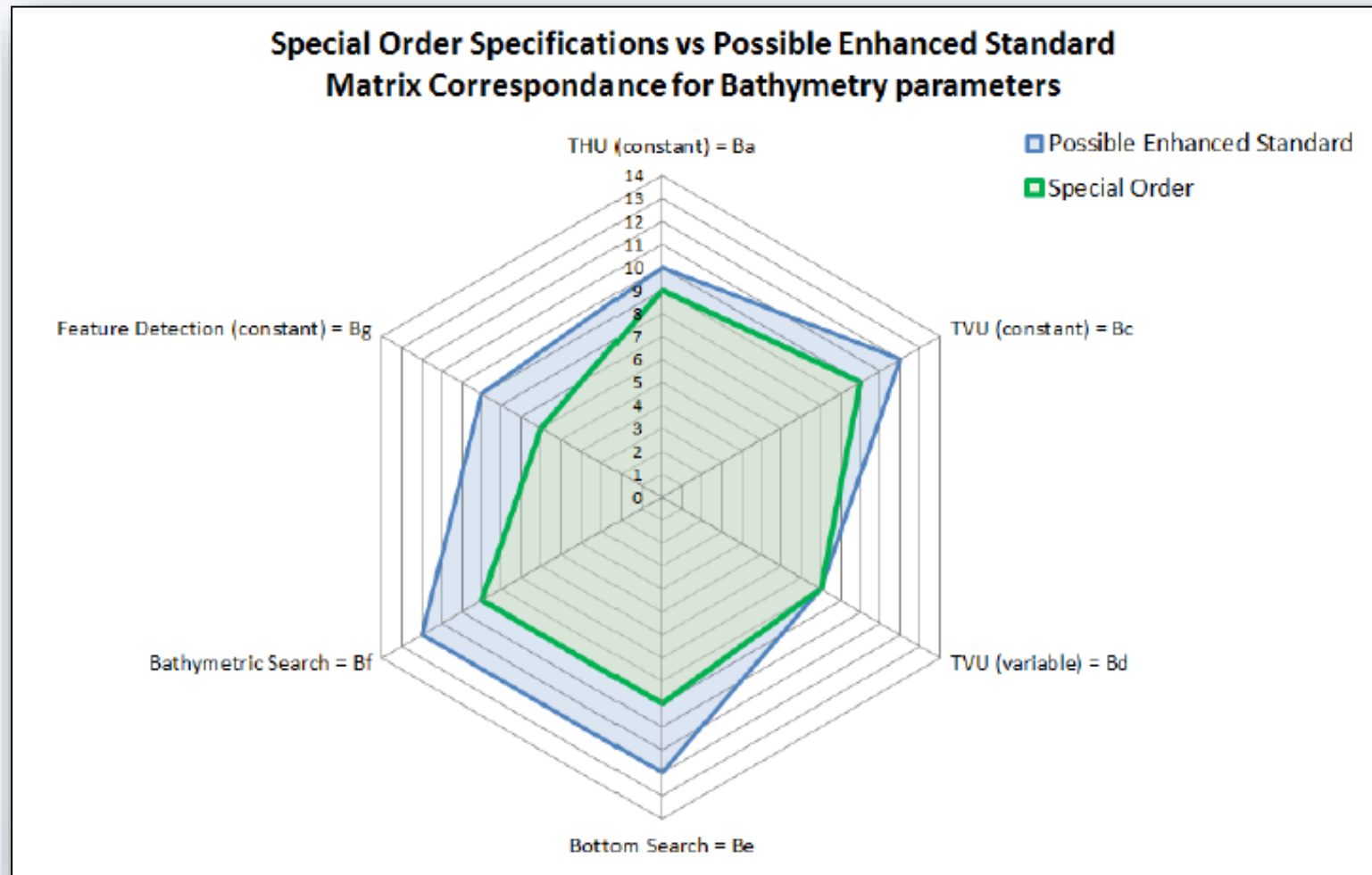


Parameter / Data Type		1	2	3	4	5	6	7	8	9	10	11	12	13	14
B	BATHYMETRY														
a	<b>Depth</b> THU (constant) [m]	500	200	100	50	20	15	10	5	2	1	0.5	0.4	0.1	0.05
b	<b>Depth</b> THU (variable) [% of depth]	20	10	5	2	1	0.5	0.25	0.1						
c	<b>Depth</b> TVU (constant, "a") [m]	100	50	25	10	5	2	1	0.5	0.3	0.25	0.2	0.15	0.1	0.05
d	<b>Depth</b> TVU (variable, "b") [% of Depth]	20	10	5	2.3	2	1.3	1	0.75	0.4					
e	<b>Feature Search</b> Depths may not be produced / derived (e.g. SSS, MBES) [%]	3	4	5	10	20	30	50	75	100	120	150	200	300	
f	<b>Bathymetric Coverage</b> Depths produced / derived (e.g. MBES, SBES) [%]	3	4	5	10	20	30	50	75	100	120	150	200	300	
g	<b>Feature Detection</b> Capability of system (constant) [m]	50	20	10	5	2	1	0.75	0.7	0.5	0.3	0.25	0.2	0.1	
h	<b>Feature Detection</b> Capability of system (variable) [% of Depth]	25	20	10	5	2.5	1	0.5	0.25						

 = Special Order



# Survey specifications display using Matrix



# Future Hydrographic Surveys Working Group (Proposal)

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Once S-44 6<sup>th</sup> Edition is published, the Project Team support the idea to continue as a standing Working Group, with the following tasks:

- Maintenance of S-44
- Updating and maintaining C-13 “Manual on Hydrography”
- Maintain close liaison with other related WG
- Lead the Translation task of S-44 into more languages (only English, French, Spanish and Portuguese currently available)
- Increase education on use of S-44 and generate a supporting document to articulate best practice guidance
- Identifying new systems, technologies and methodologies and exchanging experiences, best practice and challenges
- Act as focal point for industry engagement with the IHO

+ Wish for a collaborative space for data processing discussions



# Extract from HSSC11 list of Actions

5.6	6 <sup>th</sup> Edition of S-44	HSSC11/53	<b>HSSC</b> agreed on the recommendation made by <b>HSPT</b> that the final draft version 1.x.x of the 6 <sup>th</sup> Edition of S-44 should be circulated to all stakeholders, prior to submission for endorsement to HSSC.	<b>June 2019</b>	
5.6	6 <sup>th</sup> Edition of S-44	HSSC11/54	<b>HSPT</b> to submit final proposed version 2.0.0 of 6 <sup>th</sup> Edition of S-44 to HSSC for endorsement, with the aim to submit it to IHO Member States for approval by July 2020.	<b>HSSC-12</b> (- 7 weeks)  <b>July 2020</b>	
5.6	6 <sup>th</sup> Edition of S-44	HSSC11/55	<b>HSSC</b> approved the principle of having a contest for designing the cover page of 6 <sup>th</sup> Edition.		Decision
5.6	Future of HSPT, towards a HSWG	HSSC11/56	<b>HSSC</b> took note of the proposal to move HSPT to HSWG but invited HSPT, after completion of the 6 <sup>th</sup> Edition, to submit a formal proposal on the different options for the future of HSPT at the next HSSC meeting iaw HSPT TORs 2 (iii).	<b>HSSC-12</b>	





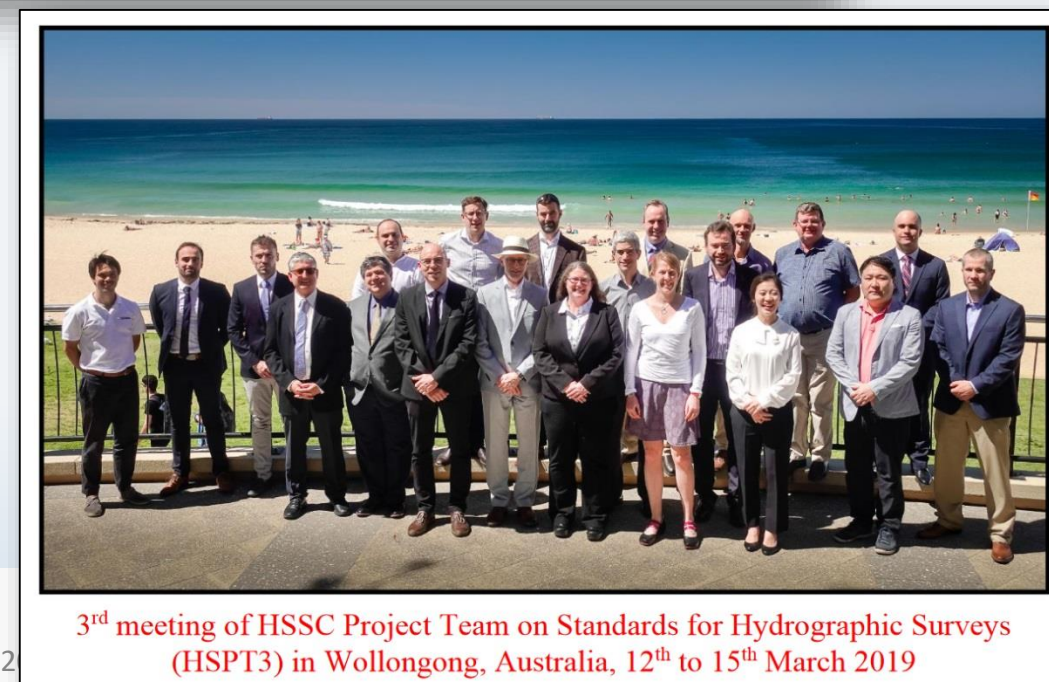
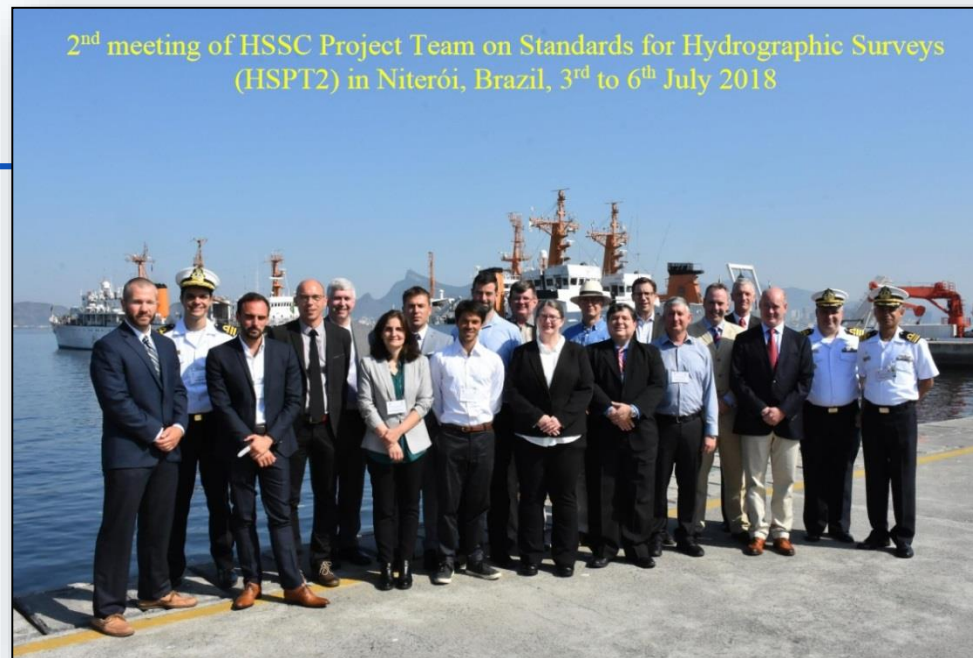


# Future Work programme

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- **Dec. 2019 - HSPT4 (Monaco)**: based on stakeholder feedbacks and HSPT last comments, release the final draft 6<sup>th</sup> Ed. Version (v1.X.X) to circulate to HSPT members + Cover topic
- **March 2020 (7 weeks before HSSC12)**: HSPT deliver the S-44 6<sup>th</sup> Edition (v2.0.0) to HSSC for endorsement
- **June 2020 (after HSSC12)**: circular letter from IHO for members states approval
- **July-September 2020 - Approval of the S-44 6<sup>th</sup> Edition (minimum 30 replies for which +50% approval)**





Thank you



International Hydrographic Organization  
Organisation Hydrographique Internationale

HSPT4 – December 2019