**HSSC12-XX.XX.**

**12th IHO-HSSC Meeting**

## Report and Recommendations of the HSSC Project Team on

## Standards for Hydrographic Surveys (HSPT)

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| --- | --- |
| ***Submitted by:*** | Chair, HSPT |
| ***Related Documents:*** | S-44 |
| ***Related Projects:*** | None |

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| *Chair:* | Christophe Vrignaud, France |
| *Vice-Chair:* | Nickolás de Andrade Roscher, Brazil |
| *Secretary:* | David Wyatt, IHO |
| *Member States:* | Australia, Brazil, Canada, France, Germany, Italy, Japan, Netherlands, Norway, Peru, Portugal, Republic of Korea, Sweden, Turkey, United Kingdom, and United States. |
| *Expert Contributor:* | International Federation of Hydrographic Societies (IFHS), Fugro, iXblue, AML, ARGANS, Garline Geosurvey, Howlett Hydrographic, IIC Technologies, Precision Hydrographic Services, UNH, and EOMAP |
|  | *See Annex A - HSPT4 and HSPT5 participants**Annex B - HSWG ToR**Annex C - S-44 Impact Study* |
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## Meetings Held During Reporting Period

HSPT4 3 – 6 December 2019 IHO, Monaco

HSPT5 2 - 6 March 2020 Stockholm, Sweden

**Future Meetings**

None (subject to IHO Member States’ approval of S-44 Edition 6.0.0)

## Objective of the HSPT

The Project Team on Standards for Hydrographic Surveys (HSPT), is tasked by the IHO Hydrographic Services and Standards Committee (HSSC) to “…*review the existing edition (5th) of the IHO publication S-44 Standards for Hydrographic Surveys, identify deficiencies…”* and “…*when undertaking this task, to consider, as a minimum,…”* the need to prepare a draft for the 6th Edition *“…in support of safety of navigation data products and services…”* (HSPT TORs refer) for subsequent approval by IHO Member States.

**Outcomes from the fourth and fifth meetings**

Since HSSC11 (May 2019 – Cape Town), the project team has had two meetings (HSPT4 and HSPT5), with substantial intersessional work.

* Intersessional work between HSPT3 and HSPT4: following HSPT3, the team submitted a consolidated version of the draft S-44 to HSCC, with the aim to circulate to IHO stakeholders for informal review and comments:
* The Chair received a large number of comments from members states and industry;
* A comprehensive review of stakeholder feedback and comments has been made by the Chair and the coordinating editors;
* Consolidation of amendments and corrections, for all comments received, into spreadsheet format for each chapter and annex;
* HSPT4 was hosted by the IHO Secretariat in Monaco – 3-6 December 2019. During this meeting:

* All information contained in review spreadsheets were considered in breakout groups focused on individual chapters;
* Revised texts, harmonisation between chapters, and uncertainty values were agreed;
* New Exclusive Order matured and generally agreed, key additional work items identified;
* Key areas requiring additional input were identified and task completion dates agreed;
* Majority of text agreed;
* Vote for the S-44 cover image was completed (USA won the contest);
* Decision to convene a last HSPT meeting was agreed.

Note: all decisions were made according to the ToR, the Questionnaire results, the comments from IHO stakeholders, and the HSPT participants’ discussions.

* Intercessional work between HSPT4 (December 2019) and HSPT5 (March 2020): work on drafting the final version was progressed. Below is the schedule of actions carried out during this period:
* From HSPT4 to the end of December: finalised the draft taking into account the remaining comments from stakeholders ;
* End of December: location for HSPT5 agreed (hosted by SMA in Stockholm);
* Beginning of January: version v1.8.0 sent to all HSPT members for review and comments.
* Mid February: inputs from IBSC Chair, CBSC Chair and IHO Assistant Director with elements supporting a possible future Hydrographic Surveys Working Group.
* End of February: all comments received, merged by the Chair in a unique spreadsheet file.
* HSPT5 was organized by the Sjöfartsverket (Swedish Maritime Authority) - 2-6 March. During this meeting:
* Mature text agreed with review of final round of comments from PT members;
* General harmonisation across publication generally achieved;
* Tables and Matrix values agreed;
* Harmonisation between text and tables/matrix confirmed;
* Final round of proof reading and checking agree prior to submission;
* Identification of items for consideration in the next edition of S-44;
* Developed draft ToRs for a proposed HSWG, see annex B.
* Intercessional work after HSPT5 (March 2020):
* Work on the final version between HSPT5 members (only on typo, grammar, and cosmetic aspects). With the aim to provide the v2.0.0 of the S-44 6th Edition by the 20th of March.
* Finalised a proposal for the Terms of Reference for a possible future Hydrographic Surveys Working Group.

**Work Programme**

After HSPT4, it was agreed that no future Work Plan would developed as it was considered that HSSC12 would disbanded the PT as having completed its tasks. A small number of items would remain, which would be completed by the Chair in association with the Secretariat, such as developing replies to IHO Member States comments submitted during the final approval process and submitting new terms and revised definitions to the HDWG after the publication had been approved by IHO Member States.

## Progress on HSSC Action Items

All related actions from HSSC11 for the HSPT have been completed.

Regarding the S-44 6th edition, the main evolutions can be sum up by this extract from the introduction of the new edition:

In this edition, a new more stringent Exclusive Order has been introduced. The use of Exclusive Order should be limited to areas with exceptional conditions and specific requirements. The other orders for safety of navigation surveys have kept the same names, but their interpretation has changed from the previous edition due to the introduction of the bathymetric coverage concept. Special Order now explicitly requires full bathymetric coverage. Furthermore, the orders have been divided into requirements above and below the vertical datum.

This edition aims to encourage the use of S-44 for purposes beyond the safety of navigation. It introduces the concept of a Matrix of parameters and data types to define realisations of survey standards and specifications. This Matrix alone is not a standard. It should be considered as a reference to specifying dedicated surveys, as appropriate, and to provide a tool for a broader classification of surveys. It is, by design, expandable and can evolve in future S-44 versions. Annex A provides guidance on how the Matrix can be used for specification and classification of surveys.

S-44 vocabulary has been revised in order to more closely align with references typically used in metrology (e.g. Guide to the expression of uncertainty in measurement). Horizontal positioning standards for aids to navigation have been revised and standards on their vertical positioning have been added. Emphasis has been placed upon the main components of hydrographic surveys while being technology independent.

## Problems Encountered

None.

## Any Other Items of Note

The case for the establishment of the Hydrographic Surveys Working Group (HSWG) has been considered by the HSPT in discussion with a number of other IHO subordinate bodies, including IBSC and SBSC, and the following tasks and work items have been identified (see Annexe B):

1. 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;
2. Update 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;
3. Lead the education on the use of S-44 and develop supporting documentation to articulate best practice guidance;
4. Lead the translation task for S-44 and C-13 to enable their widest possible application and use;
5. Maintain close liaison with 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;
6. Identify new systems, technologies and methodologies and exchange experiences, best practice and challenges amongst member states in line with the IHO objectives;
7. Act as a focal point for industry engagement with the IHO.

## Conclusions and Recommended Actions

The HSPT Chair recommends the following actions:

* A real need for a Hydrographic Surveys Working Groups within the HSSC structure has been identified, as defined in the draft ToRs. Once the HSPT is concluded, this proposed HSWG will be only subordinate body in IHO to focus on Hydrography and related operational survey aspects.

## Justification and Impacts

* See Annex C attached.

## Action Required of HSSC

The HSSC is invited to:

1. Note this report.
2. Approve the circulation of the final draft version of the 6th Edition to all Member States for final approval and adoption (<https://iho.int/en/draft-publications>);
3. Endorse the establishment of the HSWG to pursue its work under the proposed draft Terms of Reference (see Annex B) subject to any amendments agreed by HSSC12;
4. Request the HSWG to develop a work plan in line with the IHO Strategic Objectives and the approved IHO Work Programme;
5. Request the IHO Secretariat to initiate the process of selecting a Chair and Vice-Chair for the HSWG.

## ANNEX A – HSPT4 Participants

**4th meeting of the IHO HSSC Project Team on Standards for Hydrographic Surveys**

**List of Participants HSPT4**

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| --- | --- | --- | --- |
| **Member State** | **Organization** | **Name** | **E-mail** |
| Brazil | Diretoria de Hidrografia e Navegação (DHN) | Nickolás de Andrade Roscher (*vice-Chair*) | nickolas.roscher@marinha.mil.br |
| Brazil | Diretoria de Hidrografia e Navegação (DHN) | Anderson Barbosa da Cruz Peçanha  | anderson.oecanha@marinha.mil.br/andersonbcpecanha@gmail.com |
| Canada | Canadian Hydrographic Service (CHS) | Stephen Parsons | stephen.parsons@dfo-mpo.gc.ca |
| France | Service hydrographique et océanographique de la Marine (Shom) | Christophe Vrignaud (*Chair*) | christophe.vrignaud@shom.fr |
| Germany | Bundesamt für Seeschifffahrt und Hydrographie (BSH) | Jean-Guy Nistad | jean-guy.nistad@bsh.de |
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| Netherlands | Royal Netherlands Naval Hydrographic Service (RNlNHS) | John Loog | JP.Loog@mindef.nl |
| Norway | Norwegian Mapping Authority (NMA) | Vidar Bøe | vidar.boe@kartverket.no |
| Portugal | Instituto Hidrográfico (IH) | Cristina do Sameiro dos Santos Monteiro | cristina.monteiro@hidrografico.pt |
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| UK | United Kingdom Hydrographic Office (UKHO) | David Parker | david.parker@UKHO.gov.uk |
| USA | National Oceanic and Atmospheric Administration (NOAA ) | Megan Greenaway | megan.greenaway@noaa.gov |
| USA | National Geospatial Agency (NGA) | Misty Savell | Misty.D.Savell@nga.mil |
| IHO | IHO Secretariat | David Wyatt (*Secretary*) | adso@iho.int |
| IHO | Secretary-General | Mathias Jonas | mathias.jonas@iho.int |
| IHO | Director | Abri Kampfer | abri.kampfer@iho.int |
| IHO | IHO Secretariat | Yves Guillam | yves.guillam@iho.int |
| IHO | IHO Secretariat | Jeff Wootton | jeff.wootton@iho.int |
| Expert Contributor | iXblue | Fabien Germond | fabien.germond@ixblue.com |

**5th meeting of the IHO HSSC Project Team on Standards for Hydrographic Surveys**

**List of Participants HSPT5**

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| --- | --- | --- | --- |
| **Member State** | **Organization** | **Name** | **E-mail** |
| Brazil | Diretoria de Hidrografia e Navegação (DHN) | Nickolás de Andrade Roscher (vice-Chair) | nickolas.roscher@marinha.mil.br |
| Brazil | Diretoria de Hidrografia e Navegação (DHN) | Anderson Barbosa da Cruz Peçanha  | anderson.oecanha@marinha.mil.br/andersonbcpecanha@gmail.com |
| France | Service hydrographique et océanographique de la Marine (Shom) | Christophe Vrignaud (Chair) | christophe.vrignaud@shom.fr |
| France | Service hydrographique et océanographique de la Marine (Shom) | Florian Imperadori | florian.imperadori@shom.fr |
| Germany | Bundesamt für Seeschifffahrt und Hydrographie (BSH) | Jean-Guy Nistad | jean-guy.nistad@bsh.de |
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| Netherlands | Royal Netherlands Naval Hydrographic Service (RNlNHS) | John Loog | JP.Loog@mindef.nl |
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| UK | United Kingdom Hydrographic Office (UKHO) | David Parker | david.parker@UKHO.gov.uk |
| USA | National Oceanic and Atmospheric Administration (NOAA ) Office of Coast Survey (OCS) | Neil Weston | neil.d.weston@noaa.gov |
| USA | National Oceanic and Atmospheric Administration (NOAA ) | Megan Greenaway | megan.greenaway@noaa.gov |
| USA | National Geospatial Agency (NGA) | Misty Savell | Misty.D.Savell@nga.mil |
| IHO | IHO Secretariat | David Wyatt (Secretary) | adso@iho.int |
| Expert Contributor | iXblue | David Vincentelli | david.vincentelli@ixblue.com |

## ANNEX B – Project of the “Hydrographic Surveys Working Group” ToR

**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

11th meeting of HSSC, South Africa, May 2019

**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:

1. Promote the use of hydrography for the safety of navigation and all other marine purposes in order to raise global awareness of the importance of hydrography;
2. Improve global hydrographic capability, capacity, training, science and techniques;
3. Improve global coverage, availability, quality, and facilitate access to hydrographic data and metadata;
4. Establish and enhance the development of consistent international standards and guidance for hydrographic data and techniques;
5. Enhance coordination of hydrographic activities and cooperation among its Member States;
6. Maintain and develop hydrographic techniques and advancing procedures, liaising with industrial contributors.

At the 5th meeting of the IHO Hydrographic Services and Standards Committee (HSSC5) 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**

1. 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;
2. Update 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;
3. Lead the education on the use of S-44 and develop supporting documentation to articulate best practice guidance;
4. Lead the translation task for S-44 and C-13 to enable their widest possible application and use;
5. Maintain close liaison with other HSSC and IRCC working groups, in particular the work of the Data Quality Working Group (DQWG) for the presentation/visualization of nautical data to the maritime customer, and the CBSC to support the educational and best practice elements;
6. Identify new systems, technologies and methodologies and exchange experiences, best practice and challenges amongst member states in line with the IHO objectives;
7. 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**

1. 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.
2. EC membership is open to entities and organizations that can provide a relevant and constructive contribution to the work of the HSWG.
3. 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.
4. If a Secretary is required it should normally be nominated by the Secretariat.
5. 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.
6. ECs shall seek approval of membership from the Chair.
7. 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.
8. All Members shall inform the Chair in advance of their intention to attend meetings of the HSWG.
9. 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**

1. 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.
2. 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.
3. 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.
4. The HSWG should report to HSSC on its activities and submit a rolling two-year work plan, including expected time frame.

**ANNEX C – Project Impact Study for S-44 Edition 6.0.0**

**References:**

1. IHO circular letter 26/2017 – 03 March 2017 – Composition of the IHO Project Team on Standards for Hydrographic Surveys (HSPT)
2. Questionnaire analysis:

<https://iho.int/uploads/user/Services%20and%20Standards/HSSC/Project%20Team%20HSPT/MISC/HSPT-S-44_Questionaire_analysis-v2.0.pdf>

1. HSSC letter – 216 July 2019 - Call for comments on version v1.7.0 of the draft 6th edition of IHO Publication S-44 – IHO standards for hydrographic surveys

The Hydrographic Surveys Project Team is proud to submit the draft v2.0.0 of the S-44 Edition 6.0.0.

This document is the result of three years’ work from March 2017 (Ref 1) to March 2020. Over these three years, the Team has met five times, including busy inter-sessional work periods. The 6th edition of the S-44 has been compiled in the following manner: successive iterations, alternating proofreading phases between meetings and phases for defining and drafting at meetings. Furthermore, to best guide this writing progression, the team compiled a questionnaire in 2017 (Ref 2) which was completed by 500 people across the world, to gain a better understanding of the needs of the hydrographic community especially for the S-44 standards. Additionally, in the summer of 2019, a draft version was sent to the IHO Member States and stakeholders (Ref 3), which reinforced the team’s engagement with the wider professional hydrographic community. As a result of this feedback, it has allowed the consolidation of the drafting task to be completed by the end of 2019. It must be highlighted that the HSP Team is composed of representatives from Member States and Industry with broad general hydrographic experience but also, more specifically on certain related subjects such as geodesy, geophysics, cartography, metrology…

Therefore to summarize, there are 4 structured pillars which have supported this editorial work over the past three years and ensured wide exposure of the work, its anticipated results and its progress:

* The IHO terms of reference defining the HSPT (Ref 1);
* The Questionnaire published in 2017 addressed to the hydrographic community (Ref 2) ;
* The distribution of a draft version to the IHO in 2019 (Ref 3) including the associated comments received by the HSPT;
* The knowledge and expertise of the different members of the HSP Team.

This version v2.0.0 is the result of much thought and reflection, carefully managed and carried out by highly competent and dedicated team members. This new edition is not really a « revolution » but presents a true « evolution » compared to the previous edition (see note). It is felt, taking into consideration the blend and experience of the Team members, the wide distribution of the questionnaire and the circulation of the initial draft, along with the incorporation of much of the feedback and comments received in these processes; that the requirements and sprit of the resolution 2/2007 impact study have been met in full.

 Christophe Vrignaud (Chair HSPT)

**Note: Extract from the introduction of the draft v2.0.0 of the S-44 Edition 6.0.0 - Evolutions between S-44 5th and 6th edition**

The main evolutions can be sum up by this extract from the introduction of the new edition:

“*In this edition, a new more stringent Exclusive Order has been introduced. The use of Exclusive Order should be limited to areas with exceptional conditions and specific requirements. The other orders for safety of navigation surveys have kept the same names, but their interpretation has changed from the previous edition due to the introduction of the bathymetric coverage concept. Special Order now explicitly requires full bathymetric coverage. Furthermore, the orders have been divided into requirements above and below the vertical datum.*

*This edition aims to encourage the use of S-44 for purposes beyond the safety of navigation. It introduces the concept of a Matrix of parameters and data types to define realisations of survey standards and specifications. This Matrix alone is not a standard. It should be considered as a reference to specifying dedicated surveys, as appropriate, and to provide a tool for a broader classification of surveys. It is, by design, expandable and can evolve in future S-44 versions. Annex A provides guidance on how the Matrix can be used for specification and classification of surveys.*

*S-44 vocabulary has been revised in order to more closely align with references typically used in metrology (e.g. Guide to the expression of uncertainty in measurement). Horizontal positioning standards for aids to navigation have been revised and standards on their vertical positioning have been added. Emphasis has been placed upon the main components of hydrographic surveys while being technology independent*.”