From: Chair, IHO Strategic Plan Review Working Group (c/SPRWG)
To: Members of the IHO Strategic Plan Review Working Group (SPRWG)
Cc: IHO Council's Chair – IRCC's Chair

Subject: Report on draft strategic reviews and preparations for submission to the 3rd meeting of the IHO Council (C-3).

References: a) SPRWG CL 2019-02
            b) HSSC Letter to SPRWG (Attached)
            c) c/SPRWG submission to IRCC11 (Doc: *IRCC11-08D*)
            d) IRCC11-8E Roadmap for the Implementation of S-100 Services
            e) SPRWG CL 03-2019 Reply Form (Attached)
            f) IRCC11 Report and Minutes (not yet available)

Enclosure: Appendix A – Document IRCC11-08D[1]

Dear members of the Strategic Plan Review Working Group,

Introduction

1. This circular letter is to report to you the main outcomes from HSSC and IRCC regarding the development of the IHO Strategic Plan (Draft ver. 17-Mar-2019).

2. In addition, this report will outline the management plan and associated timelines for the SPRWG report to C-3.

3. At IRCC11, I presented with the support of the vice-chair Shigeru Nakabayashi and the secretary Douglas Brunt a paper (see **Appendix A**) on the subject of the feedback received on the draft strategic plan (DSP). This included comments submitted by SPRWG members and the HSSC (accessible through the HSSC web page, at "CHRIS/HSSC Letters")[2], and subsequent comments or proposals by the SPRWG's chair (see **Annexe II** of Appendix A). HSSC focused on the Targets related to Goals 1 and 2. During the subsequent discussions, further comments were noted with any other input from IRCC/CBSC members being requested prior to 24 June 2019. A review and comments regarding the proposed list of targets and performance indicators was the main request to all groups.

Discussion

4. Based on collected feedback, there remains some outstanding points for which the advice of SPRWG is requested. Specific points and general comments follow in this discussion.

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[1] https://www.iho.int/mtg_docs/com_wg/IRCC/IRCC11/IRCC11-08D_2019_EN_Future_StrategicPlan_v1.pdf

[2] https://iho.int/mtg_docs/com_wg/HSSC/LETTERS/2019/HSSC%20Letter%202-2019%20%20Comments%20on%20Strategic%20Plan.pdf

5. It was suggested that global activities, initiatives, programmes, etc., be included in the *Challenges* (Context) section. For example, SDGs, the Decade of Ocean Science, etc. should be mentioned in the text.

6. While the SPRWG drafting group made a conscience effort to preserve the wording of the strategic goals as they were prescribed by C-2, there were comments that, *"Goal 1: Evolving the support of safety and efficiency of a transforming navigation",* needed to be reworded in order to clarify its intent.

7. Regarding Strategic Plan Indicators (SPIs) in general, the IHO Secretariat suggested that these measures should be easy to generate consistently and, automatically, if possible. For instance, could any of the information reported in C-55 or the INToGIS be used (or perhaps, modified to be used) for some of the SPIs? What other information could be sourced without having to do a yearly ask of RHC, WGs, Committees, etc.

8. It was commented that under the targets for Goal 1, there is nothing specific related to development and implementation of services for achieving this goal i.e. supporting the evolution of navigation. For example, S-102, S-104, and S-111 delivered as services are being developed. Is a separate target required, and, if so, how would this be worded and what would the SPI be? Note the link with section 11 below.

9. The following points were additionally recorded during the open discussion at IRCC11. As mentioned previously, more formal inputs have been requested from IRCC. Please comment accordingly:

   a. Target 1.2, SPI 1.2.3 It was discussed that 50m depth would be an appropriate depth for relevance to safe navigation. C-55 uses currently a 200m delineation, but this could be adjusted as proposed by the UK and FR. CBSC has chosen to maintain the 200m delineation in the C-55

   b. Target 2.1: Change 'digital platform' to 'portal'.

   c. Target 2.1 Are there other ways to measure the IHO's contribution to MSDI uptake? e.g. Increasing number of IHO MSDI training taken/given. The could be measured through CB training and/or access and completion of IHO on-line training materials.

   d. Target 2.2: Add LIDAR, etc. to the list to broaden the spectrum of techniques.

   e. Does the related 2.2 indicator needs some refinement? Two suggestions for SPIs were a CSB Cookbook (?); the number of on-line training sessions taken.

   f. Target 2.3: Is the SPI measurable? Suggested (more measurable) SPI could be, "*The number of the 15 guiding principles which have been implemented i.e. x of 15*".

   g. Target 3.2 SPIs need to better reflect the target. e.g. An increase in the number of contributors and the number of soundings (datasets) contributed to DCDB.
   h. Target 3.3 Suggested wording, "*Implement a digital communication strategy which includes the use of social media and enhanced Web presence to better tell the IHO work*". 'visibility' and 'accessibility' could be the SPIs. Other SPIs for this

target could come from Web analytics (e.g. Google Analytics) once the new Web site is stood up.

10. Please review the other inputs reported in SPRWG paper to IRCC11 with respect to targets and SPIs and comment as you see fit. A reply form (Excel spreadsheet) is attached to this CL in order to help facilitate responses. If you do not wish to add comments, simply enter 'nil' in the Comments field.

Other considerations and miscellaneous items

11. The IHO Secretary General and the Chairs of the IHO Council, IRCC, and HSSC presented at IRCC11 a draft document (IRCC11-08E) on a "*Roadmap for the Implementation of S-100 Services*"[3]. This document, requested by the Council for its next meeting, is in the very early stages, but how or should this be mentioned or considered more deeply in the Strategic Plan? The realization of this roadmap could be the target mentioned above in section 8. Your thoughts on this please.

12. USA has offered to design a simplified/pamphlet version of the strategic Plan that will be more readable to the general public. That is, it will convey the strategic plan with limited technical language, IHO-specific language (e.g. S-1xx), or specific SPIs. In addition, it will be more graphical and visually appealing.

Management Plan

13. Your input, as is the input of IRCC, is requested by no later than 24 June. This will give the SPRWG Secretariat time to review the material and prepare its report by the C-3 deadline of 15 July. The report will be submitted for your comments before being sent to the IHO secretariat.

14. Council members will have until 5 August for any subsequent written comments to the report to be included in the "red book" of the next meeting of the Council..

Thank you for your support.

With my best regards,

Bruno Frachon
c/SPRWG

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[3] https://www.iho.int/mtg_docs/com_wg/IRCC/IRCC11/IRCC11-08E_2019_EN_Roadmap_Provision_S-100_Services_v1.pdf

Appendix A

Paper for Consideration by IRCC

Future Strategic Plan of the IHO

Submitted by:	Chair of the Strategic Plan Review Working Group of the IHO Council
Executive Summary:	Following decision of the Council, a provisional list of targets and Strategic Performance Indicators is proposed for consideration by the IRCC, in order to provide feedback on their possible implementation in the future.
Related Documents:	Report of the 2nd meeting of the IHO Council - http://iho.int/mtg_docs/council/C2/C2_2018_S_EN_SummaryReport_v1.2_clean.pdf Draft IHO Strategic Plan, dated 17th of March 2019 (Annexe I enclosed) Additional comments on draft SPI (Annexe II enclosed)
Related Projects:	Strategy for S-100 Preparation of the 3-year plan Work Programme 2021-2023

Introduction / Background

At its first meeting in April 2017, the Assembly of the IHO tasked the Council to conduct a comprehensive review of the Strategic Plan and to provide a draft revised Plan, as appropriate, in time for the consideration of the 2nd ordinary session of the Assembly (decision A1/03).

Consequently, the IHO Council established at its first meeting in October 2017 a Strategic Plan Review Working Group (SPRWG). Its TOR and ROP were approved by IHO Member States (MS) via IHO Circular Letter 20/2018. 23 IHO member States and the Secretary General of IHO are members of the SPRWG.

In its report to the Council, the SPRWG recommended to prepare a revised strategic plan, with a simpler structure and a limited number of measurable targets.

At its second meeting in October 2018, the Council tasked the SPRWG to develop the Strategic Plan 2021-2026 on the basis of three overarching goals endorsed by the Council (decision C2/39). It was noted that consideration should be given to the international context like the United-Nations "Decade of Ocean Science for Sustainable Development" and the negotiations on "Biodiversity Beyond National Jurisdiction".

The Council asked the SPRWG Chair to engage with HSSC and IRCC Chairs and provide them with draft Strategic Targets and Performance Indicators that could be considered at HSSC-11 and IRCC-11 for their initial feedback on the possible implementation in the future (decision C2/40).

A drafting team met in Monaco end of January, and prepared an initial list of targets and performance indicators under the three overarching goals. The drafting team also reviewed the general structure of the Strategic Plan and has proposed to the SPRWG some orientations on the content. The resulting draft is attached in annexe I.

Analysis/Discussion

A table of targets and performance indicators is presented in section III of annexe I. The last column refers to the article II of the Convention on the IHO (Object of the IHO). This synthetic

form may be difficult to understand by readers outside of the IHO, to whom the Strategic Plan is also aimed: the SPRWG is considering adding short explanations for each of the targets.

The first goal endorsed by the Council takes into account the on-going transformation in navigation, such as e-navigation, autonomous shipping etc. which will lead to profound evolution of hydrographic services, in a context of high requirements on digital data.

The second goal acknowledges the broadening use of hydrographic data in many other fields than navigation. Building on the work accomplished by MSDIWG and the IHO Secretariat, a first target proposes to give more visibility to IHO in this area, for bolstering coordination and cooperation. A second target addresses the need for new data to feed new applications of marine data.

The third goal aims to provide a broad perspective to IHO's activity, in order to make it an effective and recognized contributor to the main Ocean challenges identified by the international community.

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The draft strategic was sent to HSSC[4] for comments on the strategic performance indicators and the possibility of implementing them, and discussed at its 11th meeting in Cape Town[5].

Following this meeting; proposals of the SPRWG's Chair addressing some of issues raised are given in annexe II. They will be submitted for review to the SPRWG, and will be completed after the IRCC meeting.

A question raised during the HSSC was the handover between the HSSC and the IRCC, i.e. the limit of responsibility of HSSC with regard to IRCC. If the respective ToR of HSSC and IRCC were unhelpful in this regard, the Council could be the right coordinating organ, when necessary.

Another question raised was the "implementation strategy" necessary to achieve the strategic targets. Since the Council decided that the strategic plan should be a concise document, it seems that the implementation tools should be the responsibility of the Committees and the Secretariat, as is already done, for instance, for the Capacity Building strategy or the S-100 strategy.

Recommendations

It is proposed to IRCC to consider at its 11Th meeting the list of targets and performance indicators, for analysing the possibility of their implementation in the IHO Work Programme, and especially in the programme Inter-Regional Coordination and Cooperation. At this stage, the list is an initial draft, and is not proposed to IRCC for formal endorsement. It is recommended that feedback be provided to SPRWG by mid-June.

Justification and Impacts

The Assembly, in its 2nd meeting in April 2020, will have to adopt a revised Strategic Plan and a three-year Work Programme, which will be proposed by the Council. Feedback from IRCC will facilitate alignment between the Strategic Plan and the 3 year-Work Programme.

In this perspective, it is recalled that Resolution 12/2002, as amended, has established a final review of the 3 year Work programme by the Council 2 months before the session of the Assembly.

Action Required of IRCC
The IRCC is invited to:

    a.   note the list of targets and performance indicators listed in section III of annexe I, and the additional comments of the SPRWG Chair in annexe II

    b.   examine the possibility of their implementation in the Work Programme

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[4] http://iho.int/mtg_docs/com_wg/HSSC/HSSC11/HSSC11_2019_04.2A_FutureStrategicPlan_v1.pdf

[5] http://iho.int/mtg_docs/com_wg/HSSC/HSSC11/HSSC11_2019_04.2C_EN_Chair_Future%20strategic%20Plan_v2.pdf

c.   make any proposal as appropriate

c.   instruct IRCC Chair to provide feedback to SPRWG

**International Hydrographic Organization (IHO) Strategic Plan
For 2021-2026
Draft - 17 March 2019**

*The sea, the great unifier, is man's only hope.
Now as never before, the old phrase has a literal
meaning: we are all in the same boat.*

-Jacques-Yves Cousteau

I. PREAMBLE

Hydrography is the branch of applied science which deals with the measurement and description of the physical features of oceans, seas, coastal areas, lakes and rivers, as well as with the prediction of their change over time.

The International Hydrographic Organization (IHO), which was established in 1921 and now has 89 Member States (MS), is an inter-governmental consultative and technical organization. It primarily supports the safety of navigation and the protection of the marine environment, and coordinates on a worldwide basis the setting of hydrographic standards. It also facilitates capacity building of national hydrographic services. It provides a forum at an international level for the improvement of hydrographic services through the discussion and resolution of hydrographic issues and it assists member governments to deliver these services through their national hydrographic offices.

Purpose

The purpose of the IHO Strategic Plan is to identify specific strategic goals and targets that will direct the IHO`s Work Programme in a way that will foster the IHO vision, mission, and objects.

Vision [IHO Conv. recitals]

The vision of the IHO is to be the authoritative worldwide hydrographic body which actively engages all coastal and interested States to advance maritime safety and efficiency and which supports the protection and sustainable use of the marine environment.

Mission [IHO Conv. recitals]

The mission of the IHO is to create a global environment in which States provide adequate, standardized and timely hydrographic data, products and services and ensure their widest possible use.

Object [IHO Conv. Art. II]

The Organization has a consultative and technical nature. It is the object of the Organization:

a. To 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. To 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. To improve global hydrographic capability, capacity, training, science and techniques;

d. To 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. To give authoritative and timely guidance on all hydrographic matters to States and international organizations;

f. To facilitate coordination of hydrographic activities among the Member States; and

g. To enhance cooperation on hydrographic activities among States on a regional basis.

II. CHALLENGES

Hydrographic offices (HO) everywhere are facing significant and rapidly developing challenges. Some challenges impact the mission of the IHO and shape the context to be taken into account by the Organization for building its strategy to fulfil its vision.

More and more diverse customers, with increasing demands

There is an enlarged global demand for hydrographic data either through the evolution of requirements of navigation, or for the management of the marine environment.

For navigation, safety challenges are marked by the development of harbours in many countries, and of new routes of navigation. Moreover, the core role of shipping in globalization puts pressure on its efficiency, which through digitisation and automation generates needs for new, reliable services supporting the safety and efficiency of navigation. All categories of navigators, from merchant mariners to leisure boaters, are eager to access the new services enabled by digital technology. In the same time, complexity of technologies available to mariners raises new concern regarding their appropriation.

An increasing need for marine data is strived by the development of a sustainable Blue Economy, the concern for the protection of the marine environment, and the prevention or mitigation of consequences of marine disasters or climate change. A wide range of related data is now crucial in supporting important decisions. These data, and associated skills, are very similar to those used for supporting navigation.

Progress in technology

The pace of technological changes, from sensors to digital services, is increasing, bolstering the need for continuous adaptation of training and standards, thus requiring strong effort from HO in investment and training. This is particularly significant for the automation of sensors carrying devices, and for new processing techniques from the field of artificial intelligence, which make it possible to handle 'big data' and augment the capacity of human teams.

Data, transforming the hydrographic ecosystem

While the demand for hydrographic data is increasing, the assets or resources available to many hydrographic offices have not increased at a similar rate. However, the accessibility to technology and the interest in citizen science (or crowd-sourced data) has given opportunities to many actors to collect valuable data. This information can be used for many purposes, including for improved navigation. These tools and techniques being used are often considered to be outside traditional hydrographic methods, and this calls for the IHO and HOs to redefine their relationships with these new sources of hydrographic data.

More generally, the crucial role of data and information in our societies entails important consequences on public policy (e.g. open data), the need for data assurance, including cyber security, all along the value chain, and on the involvement of the private sector, which are likely to have an impact on how investments in hydrography are sustained, and how standards are developed.

III. GOALS, TARGETS FOR 2026 & STRATEGIC PERFORMANCE INDICATORS

To face these challenges, the IHO Strategic Plan for 2021-2026 is structured through three overarching goals, focusing the exercise of its mission during the period.

Under the three goals, the Organization has identified targets to be reached by 2026. The progresses towards these targets are measured by strategic performance indicators (SPI). The following tables summarize for each overarching goal the targets and associated SPI. Related object items of the IHO (Convention) are given for reference purpose.

Goal 1: Evolving the support of safety and efficiency of a transforming navigation

Targets	SPI (measure for success)	Relation with IHO Object
1.1 Deliver standards for data formats and product specifications including accompanying transition and implementation support.	The IHO and IMO have established a common implementation strategy/plan for the S1XXdata model and data products based on.	a, d, e
	Complete and implement a refurbished standardisation of paper charts as "print on demand" based on content of electronic nautical charts	d, e
	S1XX caters for the requirements of autonomous shipping	a
1.2 Develop standards and best practices in the areas of data assurance, including cyber security and data quality assessment.	Data products and service delivery and distributing chains are certified as cyber secure.	b
	Level of ENC overlaps	b
	For areas with water depth less than YY meters, the adequacy of the hydrographic knowledge is assessed	b

Goal 2: Developing the use of hydrographic geospatial data for the benefit of society

Targets	SPI (measure for success)	Relation with IHO Object
2.1 Build a digital platform to support and promote regional and international cooperation in marine spatial infrastructures (MSDI).	The digital platform shows a strong positive trend in the number of hits	b, g
2.2 Adopt or promote new tools and methods to accelerate and increase coverage, consistency, quality of surveys in poorly	Quality indicators available and applied to all sorts of hydrographic data	b
	New S-44, for all kind of applications,	d

surveyed areas, e.g. crowd-source bathymetry; satellite-derived bathymetry.	navigation and others, is promulgated.	
2.3 Adopt and apply UN guiding principles for geospatial information management in order to ensure interoperability of hydrographic data with other marine-related data.	S1XX data sets play a strong and recognized role in the global MSDI.	d, g

Goal 3: Participating actively in ocean-related activities

Targets	SPI (measure for success)	Relation with IHO Object
3.1 Enhance existing capacity building programme and strategies, and collaborate with other bodies who deliver capacity building and training.	90% of Coastal States have reached Phase 1 (MSI).	c
3.2 Enhance knowledge of the world's seafloors through establishment of streamlined automated processes for acquisition, harmonization and ingestion of bathymetric data from any sources into the global data repository of the IHO Data Centre for Digital Bathymetry (DCDB).	All accessible public bathymetric data of MS is uploaded to and available from the DCDB. DCDB takes advantage from ingestion of expert survey contributions from industry and crowd source bathymetry from ships of opportunity	b, f b
3.3 Enhance IHO digital communication and Web presence in order to maximize visibility and accessibility of standards and data provisions.	IHO is present on social media IHO web-site gives access to a fully traceable repository of all documents and incorporates GIS services.	a b,e

IV. IMPLEMENTATION FRAMEWORK

To deliver on the designated Targets and achieve the three Goals, the IHO Secretariat and the two IHO Committees – the Hydrographic Services and Standards Committee (HSSC) and the Inter-Regional Coordination Committee (IRCC) – will deliver and pursue the respective Work programmes, using the following means:

- Standardization
- Coordination & Cooperation
- Capacity Building
- Communication

The advancement of the IHO Strategic Plan is only possible through the participation of MS at the working group and committee levels, and by the support and direction provided by the IHO Secretariat. The Strategic Plan is not a comprehensive description of the activity of IHO, which is fully described in its Work Programme.

Work Programme

The triennial IHO Work Programme covers the period starting on 1 January of the year following the ordinary session of the Assembly and ending on 31 December of the year of the next ordinary session. The triennial IHO Work Programme is divided into following three programmes:

- Corporate Affairs under the responsibility of the Secretary General,
- Hydrographic Services and Standards under the responsibility of the relevant Committee (HSSC), The HSSC programme includes the activities to be conducted by its subordinate bodies as well as by inter-organizational bodies that report to the HSSC.
- Inter-Regional Coordination and Support under the responsibility of the Inter Regional Coordination Committee (IRCC). The IRCC programme includes the activities to be conducted by its subordinate bodies as well as by the Regional Hydrographic Commissions and by inter-organizational bodies that report to the IRCC.

Review cycles

The review cycles for the Strategic Plan, the Work Programme and the Budget are set out in IHO Resolution 12/2002 as amended. The triennial IHO Work Programme is reviewed annually by the Council in liaison with the Chairs of the HSSC and the IRCC.

Progress monitoring

The success in achieving of the Strategic Goals and Targets is measured by Strategic Performance Indicators (SPIs).

Taking into account the object of the Organization and the overarching goals and targets, the success of Work Programme will also be measured by indicators which show the progress of the various elements of the Work programming that contribute to these objects, goals and targets.

Annexe II

Comments and Proposals for strategic performance indicators (SPI)
26 May 2019

Goal 1: <u>Evolving the support of safety and efficiency of a transforming navigation</u>
Comments: It was asked to clarify "a transforming navigation". Improved wording could be "Evolve the support for safety and efficiency of navigation, which is undergoing profound transformation"

Target 1.1   <u>Deliver standards for data formats and product specifications including accompanying transition and implementation support</u>
-   [SPI] The IHO and IMO have established a common implementation strategy/plan for the S1XXdata model and data products based on
    Comments:
    o   *This SPI could be modified to a quantification of the level of maturity of the implementation strategy / plan (including the IHO strategy on S-100 under development - see HSSC11-04.2A). It could be associated with the "TRL" of the S-10x standards, as introduced at the last HSSC (see doc. HSSC11-05.1D).*
    o   *The question could arise to monitor the availability of the products, as done for ENCs in the current strategic plan (SPI2 & SPI9). This would depend of the outcomes of the work on the WENS concept, under consideration by IRCC (see doc. WENDWG9-05B Straw man Paper "WENS Principles" and IRCC11-07D2).*
    o   *Since S-101 is pivotal in the transition from "S-57 ENC only" to S-100 based e-navigation, monitoring the level of transition to S-101 could be a good indicator of the progress to the larger transition to S-100.*
    HSSC comments: The SPI 1.1.1 should be re-worded to the following: "XX% of the Member States have operationalized some S-1XX based products by XXXX (year)".
    This could be a way to make SPI 1.1.1 measurable. Further details could be considered in the S-100 Strategic Implementation Plan, as requested by the Council with the Action C2/31. Moreover, in order to monitor the accomplishment of Goal 1, the HSSC considers it relevant that such SPI takes into account the incorporation of S-100 Standard and resultant products into relevant IMO standards for SOLAS navigation. This could be a key driver for new front-of-bridge products that are going to be operationalized in the future.
    SPRWG Chair comments:
    o   *preparation ("backbridge") is within the scope of IMO*
    o   *C2/31 does not include IMO involvement: how do we manage it? HGDM? see IMO's ECDIS Performance Standard*
    o   *SPI should be "global"*

- [SPI] Complete and implement a refurbished standardisation of paper charts as "print on demand" based on content of electronic nautical charts

  Comments: Transition from paper to electronic is a strategic point for the coming years, impacting users, distributors and producers. Such a transition will depend on national contexts: a SPI could be focused on the availability of a relevant IHO framework, allowing member States to base eventual paper charts services on the content of ENC. SPI could be the level of maturity of this framework.

  HSSC comments: The SPI 1.1.2 could be re-worded to the following: "Complete and implement a refurbished standardisation of paper charts to enable advanced support for "print on demand" based on content of S-101 electronic nautical charts" or "Improved paper chart production based on S-101 ENC data implemented and standardized".

  Following HSSC discussion about the "Future of Paper Charts" (see HSSC11-05.4B paper), referring to SPI 1.1.2 "Complete and implement a refurbished standardisation of paper charts as "print on demand" based on content of electronic nautical charts" (see SPRWG e-letter 2/2019 dated 13 March 2019) could generate a non-unique interpretation. The proposed changes would recognise the fact that the full automation of paper charts production from ENCs, especially from S-57 ENCs, will be extremely challenging to be standardize for many reasons. For example, paper charts have traditionally allowed a significant amount of national interpretation – both in concepts and symbology. A fully automated production would require Member States to give up that possibility, which they have been very eager to retain. There is also a significant number of national special requirements that are currently encoded only on ENCs as information (free text), and therefore nearly impossible to automate. The S-101 ENC Product Specification makes it easier to have these modelled into the data, unlike in S-57.

  For the same reason, it should be avoided to give the impression that paper charts must in the future be produced from ENC products – this should be a possibility, not a requirement.

  A solution to produce paper charts from S-101 data instead of the S-57 data, also needs to be considered.

  Chair SPRWG: ...

- [SPI] S1XX caters for the requirements of autonomous shipping

  Comments: IMO has started to work on this subject (see doc. HSSC11-07.2A), and IHO could be proactive and work with IMO and stakeholders to build the specifications of what should be hydrographic support to autonomous shipping, and its possible implementations. SPI could therefore be: "Level of maturity of the technical specification of the hydrographic support of autonomous shipping"

  HSSC comments: While contributing to the "transforming navigation" process, HSSC recommended that an investigation is required to determine what the data requirements will be for facilitating autonomous ships. It was noted that there should be a fall back option that will enable the data to be understandable and readable by

humans. This concept could lead to a parameter to be monitored in order to give effectiveness to SPI 1.1.3 achievement. The SPI 1.1.3 could be re-worded to the following: "Autonomous shipping requirement supported by S-1xx"

SPRWG Chair's comments: which organ of the IHO will investigate the requirements. IRCC, WEND have in charge the way to co-operate and co-ordinate, not determining the service requirements of the mariners, more addressed in HSSC.

Target 1.2   Develop standards and best practices in the areas of data assurance, including cyber security and data quality assessment

- [SPI] Data products and service delivery and distributing chains are certified as cyber secure.

Comments: such a certification may be under national or RENC-like structures responsibility. However, it is probably essential that IHO provides a general framework / policy to support national or regional responsibilities. It is therefore suggested that the performance indicator could read: "Level of maturity of the IHO principles and framework for standards and best practices in the area of data assurance, including cyber security and data quality assessment".

HSSC comments: Data encoding and encrypting exchange set activities are normally monitored at HSSC WGs/PTs Level and by the main stakeholders, in order to standardize the content of the IHO dedicated publication (S-63). At the moment, the proposed ENC exchange sets are not yet supported by the existing model of ENCs distribution, highlighting the need of implementing a full risk assessment. Consequently, SPI 1.2.1 could be re-worded to the following: "% of certified cyber secure data products and services delivered by XXXX (year)".

SPRWG Chair's comments: it would be difficult for IHO to acknowledge that it does not provide cyber secure information ...

- [SPI] Level of ENC overlaps

Comments: it has been suggested that such an indicator could be left to the implementation level (i.e. IRCC or WENDWG). Over the period 2021-2026, progress on such an indicator should be considered in the context of S-101.

- [SPI] For areas with water depth less than 50 meters, the adequacy of the hydrographic knowledge is assessed

Comments: such a performance indicator would capture the importance given in RHC on risk assessment. Under strategic goal 1, such assessment is to be evaluated against navigation needs, and it is suggested that the SPI could read: "For 100 % of areas of water less than 50 meters deep, the adequacy of the hydrographic knowledge for navigation and potential other uses is assessed".

HSSC Comments: Regarding the SPI 1.2.3, "For areas with water depth less than 50 meters, the adequacy of the hydrographic knowledge is assessed", if we consider C-55, the 200m bathymetric contour should be taken into account. Therefore, it could be wise

to use the same C-55 limitation, and probably not deal exclusively with "very shallow water" concept. In relation to the fact that
SPI should be measurable with an objective (%), by country or worldwide, the "very shallow water" concept or any other related element in C-55 could not provide objectiveness to the indicator measurement. It is proposed to set as measurable indicator the CATZOC encoding.
It is proposed to re-word the SPI 1.2.3 to the following: "XX% of CATZOC X (or QoBD level better than X) assessed by XXXX (year)".
SPRWG Chair's comments:

- *From the C-55 review project team: "Fit for purpose. From a safety of navigation perspective, assessments of the entire 0 200m depth area for surveying and charting adequacy are not particularly useful for the vast majority of ships.*

  Based on the current and forecast size of vessels and the dynamic nature and complexities of seafloors, a different depth range, e.g. 0-50m may produce more relevant assessment result". Extending the depth limit to 200 m extend largely the area to assess in areas where the continental shelf is large, although for surface navigation 0-50 m is sufficient.

- *A SPI should not specify how the adequacy is assessed (C-55, CATZOC, QoBD)*

Goal 2: <u>Developing the use of hydrographic geospatial data for the benefit of society</u>

Target 2.1 <u>Build a digital platform to support and promote regional and international cooperation in marine spatial infrastructures (MSDI)</u>

- [SPI] The digital platform shows a strong positive trend in the number of hits
  Comments: it has been noted that such an indicator is a measure of the usefulness of the platform, not one of its construction. The platform aims to be a component of the IHO GIS, including meta-data on MSDI, usable by member States and stakeholders as a "knowledge resource" (providing links to standards, as well as examples, tutorials, references to services provided by member States or regional organizations); the SPI could therefore be a measure of the number of member States, RHC & IHO providing information on MSDI through the IHO GIS.

Target 2.2 <u>Adopt or promote new tools and methods to accelerate and increase coverage, consistency, quality of surveys in poorly surveyed areas, e.g. crowd-source bathymetry; satellite-derived bathymetry</u>

- [SPI] Quality indicators available and applied to all sorts of hydrographic data
  Comments:
  o *Although important, quality indicator is probably not the only aspect to take into account to get IHO endorsement of new tools and methods. It is suggested that the indicator should read "Number of new tools and methods for collecting hydrographic data, documented by IHO according to their potential uses".*

o   *Alternatively, the effect of this target could also be monitored as a measure of success: SPI could be "X % of poorly surveyed areas has been surveyed with an assessed quality".*

HSSC comments: The transition from S-57 to S-101 opens new opportunities to provide a better mechanism to the mariners to support decision making and improving safety of navigation. In this regard, data quality indicators have a fundamental role: not only can they be used for risk management by the mariner, but they can also support maritime autonomous surface ships development. In fact, as highlighted during HSSC, data quality indicators are fundamental to assure overall spatial awareness and support decision making with a conditional visualization methodology. The SPI 2.2.1 could be re-worded to the following: "Quality indicators for all types of hydrographic data available and applied".

-   [SPI] New S-44, for all kind of applications, navigation and others, is promulgated
    Comments: revised S-44, under development, will not recommend specifications for usages, but will give a matrix of specifications, providing easy references to performances, to be chosen by users. This S-44 ed.6 will give a signal that standards for hydrographic survey can be tailored according to the usage, contributing to a better assessment of the existing knowledge, and encouraging its increase. The PI could read: "New S-44 is usable for all kind of applications, navigation and others, and communities of user communities develop from it standards and quality controls relevant to their use".
    HSSC comments: The S-1xx framework provides a solution to meeting the expanding global demand for hydrographic data and services for the mariners, and more generally for the benefit of the entire Maritime Community.
    It is anticipated that SPI 2.2.2, could be achieved by 2021 with the publication of the S-44 6th Edition. Therefore SPI 2.2.2 could be re-worded to the following: "New Edition of S-44 promulgated for all hydrographic applications and wider use by 2021, revised every 2 years, and fully implemented by all HOs by 2026".

Target 2.3   Adopt and apply UN guiding principles for geospatial information management in order to ensure interoperability of hydrographic data with other marine-related data.

-   [SPI] S1XX data sets play a strong and recognized role in the global MSDI.
    Comments: the link with UN-GGIM is not direct, and "global MSDI" itself would be difficult to define. A SPI could be the number of guiding principles, amongst the 15 of the UN-GGIM, that are implemented at the IHO level (resolutions, procedures...).
    HSSC comments: In order to estimate the value of using S-1xx data sets for MSDIs, SPI 2.3.1 could be re-worded to the following: "% of S-1xx data sets in the regional and global MSDI". In fact,
    MSDI should be analyzed both at regional and global level, taking into account UN-GGIM recommendations. Finally, considering the topic, the SPI 2.3.1, a complimentary analysis needs to be completed by IRCC/MSDIWG.

Goal 3: Participating actively in ocean-related activities

Target 3.1 Enhance existing capacity building programme and strategies, and collaborate with other bodies who deliver capacity building and training

- [SPI] 90% of Coastal States have reached Phase 1 (MSI).

  Comments: Since CB is not limited to Phase 1, it was suggested that an indicator be added on number of IHO member States that have reached Phase 2. The current strategic plan includes a similar SPI (SPI 3: Percentage of Coastal States which provide hydrographic services, directly or through an agreement with a third party, categorized by CB phases). Due to the lack of reports from the RHCs on this point, no estimates are available, at least since 2012.

  CBSC Chair comment: The current SPIs are insufficient and the CBSC is well aware of that. The status regarding CB should indeed include all phases, but the regions have not been able yet to provide figures for them except phase 1. Another SPI could be to provide coordinated CB-Programme with other bodies including joint projects. A third one could be on the awareness or the ability of coastal states or regions to do Capacity Development.

  SPRWG Chair comment: at C-2 CB was identified as a core instrument for achieving the "high level" strategy as summarized by the three "strategic goals". The strategic target 3.1 was proposed by the drafting team as contributing to the goal of better visibility of IHO in Ocean-related programmes, which involve other organizations, because capacity building is always a component of these programmes, and is therefore a good field for cooperation between IHO and other organizations. In this perspective, achievements in Phase 1 seem a relevant indicator, as it may involve IALA and IMO for instance; your two proposals are interesting as well, and I look forward to the outcomes to the CBSC. In general, it would be very useful for the consolidation of the IHO strategy itself to see how the CB strategy supports the proposed strategic targets. It could result in specific PI for CB, or amendments to the proposed PI at the strategic level (SPI).

Target 3.2 Enhance knowledge of the world's seafloors through establishment of streamlined automated processes for acquisition, harmonization and ingestion of bathymetric data from any sources into the global data repository of the IHO Data Centre for Digital Bathymetry (DCDB).

- [SPI] All accessible public bathymetric data of MS is uploaded to and available from the DCDB.

  Comments: Technology allows bathymetric data to be managed by the competent entities responsible for updating the information, and to be automatically accessible (iaw EU Inspire Directive, for instance) via *many others without need for centralized uploading. It is therefore suggested to read: "All accessible public bathymetric data of MS is available through the DCDB." The associated indicator would be the number of complying member States.*

- [SPI] DCDB takes advantage from ingestion of expert survey contributions from industry and crowd source bathymetry from ships of opportunity
  Comments: SPI could be the ratio between quantity of received data per year and the average annual quantity of data received between 2014 and 2020

Target 3.3 <u>Enhance IHO digital communication and Web presence in order to maximize visibility and accessibility of standards and data provisions.</u>

- [SPI] IHO is present on social media
  Comments: An indicator could more precisely report the trends in visibility, (e.g. by the number of followers on twitter or linked-in, number of RT or comments.

- [SPI] IHO web-site gives access to a fully traceable repository of all documents and incorporates GIS services.
  Comments: An indicator could report the improvement with regard with the current situation: it could be based on the number of documents or services that should be accessible via the web-site, and are not currently accessible.