

# INTERNATIONAL HYDROGRAPHIC ORGANIZATION



## IHO Capacity Building Strategy

## Document History

Date	Version	Source	Comments
2021-03-29	0.0	D. Brunt	Initial draft of update to the 2014 version of the CB Strategic Plan
2021-04-06	0.1	CB Strategy Project Team	Incorporation of comments received from PT.
2021-04-07	0.2	CB Strategy Project Team	Incorporation of comments received during the PT meeting.
2021-04-20	0.3	CB Strategy Project Team	Incorporation of comments received after PT meeting

## Preamble

**Considering** the International Hydrographic Organization (IHO) publication M-2, *The Need for National Hydrographic Services*;

**Considering** paragraph 4 of the Terms of Reference section of the IHO *Inter-Regional Coordination Committee (IRCC) Terms of Reference and Rules of Procedure*; and,

**Considering** paragraph 1 of the Terms of Reference section of the IHO Capacity Building Sub-Committee (CBSC) Terms of Reference and Rules of Procedure;

**Considering** the goals and targets of the IHO Strategic Plan as adopted by the 2<sup>nd</sup> Assembly of the IHO;

The CBSC has developed the following Capacity Building Strategy:

## **Article 1 - INTRODUCTION**

### The IHO and Capacity Building

1. Capacity building is a vital component of the efforts of intergovernmental technical organizations to support the development goals of the United Nations (UN). The IHO is committed to matching its efforts to those of the International Maritime Organization (IMO), the Intergovernmental Oceanographic Commission (IOC), the International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA), the International Federation of Surveyors (FIG) and other organizations working in allied fields.
2. In the IHO, capacity building is defined as the process by which the organization assesses the status of current arrangements and assists States to achieve sustainable development and improvement in their ability to meet hydrographic, cartographic and maritime safety obligations with particular reference to recommendations in UNCLOS, SOLAS, and other international instruments. The scope encompasses all hydrographic needs as it underpins every other activity associated with the sea, including safety of navigation, protection of the marine environment, national infrastructure development, coastal zone management, marine exploration, marine resource exploitation (minerals, fishing, etc.), maritime boundary delimitation, maritime defence and security, and coastal disaster management.
3. The 2<sup>nd</sup> Session of the IHO Assembly approved a new IHO Strategic Plan. The Capacity Building Sub-Committee subsequently stood up a Capacity Building Strategy Project Team (CBSPT) to revise the Capacity Building Strategy (CBS) to ensure that this strategy is consistent with the IHO Strategic Plan.

## **Article 2 – CONTEXT**

### Purpose

4. The purpose of the Capacity Building Strategy is to define the context and the processes that will lead to improving global hydrographic capability, capacity, training, science, data management, and techniques.

### Vision

5. The vision of the IHO is that its capacity building approach is established and recognized as an effective, reliable and successful programme for achieving the desired level of maturity for a state's hydrographic services.

### Mission

6. The mission of the IHO is to optimally provide all coastal states with the opportunity to develop the capability to establish and maintain the hydrographic products and services required to ensure safe navigation and the sustainable management of marine resources in their waters.

### IHO Strategic Plan

7. The IHO Strategic Plan sets out goals and targets for all work programmes of the organization. Some of these goals and targets relate directly or indirectly to capacity building. The Capacity Building Sub-Committee (CBSC) under the direction of the Inter-Regional Coordination Committee (IRCC), will be

responsible for contributing to the achievement of these goals and the meeting of these targets. Therefore, the Capacity Building Strategy must be executed within the context of the IHO Strategic Plan.

Table 1. IHO Strategic Plan Goals, Targets, and Strategic Performance Indicators relating to Capacity Building.

<b>Targets</b>	<b>Strategic Performance Indicator (SPI)-measurement for success</b>	<b>Proposed Lead</b>
<b>Goal 1: Evolving the hydrographic support for safety and efficiency of maritime navigation, undergoing profound transformation</b>		
1.3 Use capacity building and training to develop and increase the ability of Member States to support safety and efficiency of maritime navigation.	1.3.1 Ability and capability of Member States to meet the requirements and delivery phases of the S100 implementation plan (2026: 50%).	IRCC
<b>Goal 2: Increasing the use of hydrographic data for the benefit of society</b>		
2.2 Promote new tools and methods to accelerate and increase coverage, consistency, quality of surveys in poorly surveyed areas.	2.2.1 Percentage of adequately surveyed area per coastal state.	IRCC
2.3 Apply UN shared guiding principles for geospatial information management in order to ensure interoperability and extended use of hydrographic data in combination with other marine- related data.	2.3.1 Number of HO's reporting success applying the principles in their national contexts (2026: 70%).	IRCC
<b>Goal 3: Participating actively in international initiatives related to the knowledge and the sustainable use of the Ocean</b>		
3.1 Collaborate with other bodies who deliver capacity building and training to improve effectiveness of capacity building activities and programmes	3.1.1 Percentage of Coastal States that are capable to provide maritime safety information (MSI) according to the joint IMO/IHO/WMO manual on MSI (2026 90%).	IRCC

#### United Nations Sustainable Development Goals

8. The United Nations (UN) Sustainable Development Goals (SDG) aspire to address some of the world's most pressing problems through humane and scientific approaches where knowledge is collected and shared on an equitable basis.

9. For SDG 5: Gender Equity, the IHO Capacity Building Strategy must ensure that all sponsored projects and opportunities are free from gender biases. IHO should actively promote gender equity among Member States, within the Secretariat, and in the governance of the IHO (e.g. committees, working groups, etc.).

10. Very much related to IHO Strategic Goal 2, the IHO must consider how its capacity building efforts are contributing to achieving SDG 14: Life Below Water, which is to conserve and sustainably use the oceans, seas, and marine resources.

### Technology

11. Technology continues to develop rapidly in all fields, including hydrography. The IHO must be cognizant of the speed of these changes and be agile enough to adjust to the challenges and take advantage of the opportunities that are present in the capacity building environment. The opportunities include the deployment of e-learning, augmented reality, and other learning and teaching techniques to reach larger and more diverse audiences.

12. Challenges include the need for rapid curriculum updating to keep up with technology changes to ensure that the skills taught by programmes today will be relevant in the future. Specifically, hydrographic personnel must be well equipped to work in the realm of S-100, to use of sensors new to hydrographic applications (e.g. satellite derived bathymetry), to capitalizing on citizen science (e.g. crowd-sourced bathymetry), and to work with autonomous survey platforms.

### Principles

- 12.. The strategy and its implementation will be consistent with the following principles:
- a. Individual national needs for infrastructure, together with a nation's capacity for infrastructure development, should be assessed firmly against the 3 phases of development as defined in M-2 and shown in Figure 1.
  - b. Skill and technology transfers must result in solutions which are appropriate and sustainable.
  - c. Wherever possible, capacity building projects should be coordinated regionally and be supported through regional cooperation.
  - d. The national administration of a State with developing hydrographic services must embrace and support the concept of capacity building as being in its national interest.
  - e. The focus should be on achieving enduring output which will benefit safe navigation, safety of life at sea, protection of the marine environment and economic development, rather than on creating enabling infrastructure per se.
  - f. Funding of Non MS is generally limited to technical visits and Phase 1 projects (this will include an overall assessment of the status of hydrography and information of relevant authorities). Exceptions to this have to be reflected against the resources provided, the expected output and the situation in the country.
  - g. Funding of equipment shall be limited to those cases, where it is embedded into a comprehensive programme (see Article 3 - PROCESS) requesting such equipment to remain in-country to complete the project, and insuring a sustainable effect and ongoing support. Whenever possible, external funds should be included, taking into account the relatively high costs of equipment and assuring a reasonable cost-benefit-ratio for the improvement of the hydrographic capacity;
  - h. Comprehensive programmes (see Chapter 5) may be supported by start-up funds to allow participation in, or preparation of, externally funded projects, especially when

substantial additional funds can be expected;

i. The use of consultants will be permitted if this supports the vision and the objectives of this strategy; and,

j. CB funds may be allocated for administrative purposes (the amount/percentage to be agreed by the CBSC).

## PHASES OF DEVELOPMENT OF HYDROGRAPHIC SURVEYING AND NAUTICAL CHARTING CAPABILITY

Phases of Development	National Activity
<p><b>Phase 0</b></p> <p>Unaware of its national obligations</p>	<ul style="list-style-type: none"> <li>• The country does not have a National Authority (NA) and/or National Hydrographic Coordinating Committee (NHCC)</li> <li>• Need to raise maritime awareness</li> <li>• Need to create infrastructure to collect and circulate maritime safety information</li> <li>• Need to strengthen links with NAVAREA Coordinator to enable the promulgation of safety information</li> <li>• Form National Authority (NA) and/or National Hydrographic Coordinating Committee (NHCC)</li> </ul>
<p><b>Phase 1</b></p> <p>Aware of its national obligations but need to improve their processes. Collection and circulation of nautical information, necessary to maintain existing charts and publications up to date</p>	<ul style="list-style-type: none"> <li>• Create/improve current infrastructure to collect and circulate information</li> <li>• Strengthen links with charting authority to enable updating of charts and publications</li> <li>• Minimal training needed</li> <li>• Strengthen links with NAVAREA Coordinator to enable the promulgation of safety information</li> <li>• Keep a National Structure to prevention or mitigation of consequences of marine disasters or climate change</li> </ul>
<p><b>Phase 2</b></p> <p>Creation of a surveying capability to conduct:</p> <ul style="list-style-type: none"> <li>• Coastal projects</li> <li>• Offshore Projects</li> </ul>	<ul style="list-style-type: none"> <li>• Establish capacity to enable surveys of ports and their approaches</li> <li>• Maintain adequate aids to navigation</li> <li>• Build capacity to enable surveys in support of coastal and offshore areas</li> <li>• Build capacity to set up hydrographic databases to support the work of the NA/NHCC</li> <li>• Provide basic geospatial data via MSDI</li> <li>• Requires funding for training, advising &amp; equipment or contract survey</li> </ul>
<p><b>Phase 3</b></p> <p>Produce paper charts, ENC and publications independently</p>	<ul style="list-style-type: none"> <li>• The need shall be thoroughly assessed. Requires investment for production, distribution and updating</li> <li>• Alternatively, bi-lateral agreements for charting can provide easier solutions in production and distribution (of ENC through RENCs) and rewards.</li> <li>• Further development of MSDI</li> </ul>

**Figure 1**

## Objectives

13. The willingness of the IHO to assist capacity building has been expressed in terms of short and long term objectives, providing a clear signal of the desired effect which the Organization is seeking. These objectives also constitute guidance for the work of the CBSC in implementing this strategy.

### 14. Long Term Objectives:

- a. To enable all states which have navigable waters to achieve Phase 1 of development (i.e. timely collection and promulgation of hydrographic information for their national waters), and to develop a national plan to put in place appropriate elements of Phases 2 and 3 or alternative cooperative regional or bilateral arrangements.
- b. In conjunction with the IMO's Technical Cooperation Committee and IALA's World Wide Academy a series of 'country profiles' will be developed to accurately measure the state of hydrography in every coastal state.

### 15. Short/Medium Term Objectives:

- a. To implement a programme of events to raise awareness of the importance of hydrography at all relevant levels, including the use of hydrographic data for the benefit of society (see Goal 2 of the IHO Strategic Plan)
- b. To establish a GIS-based electronic version of C-55 presenting an accurate picture of the status of hydrographic services world-wide, as available to mariners.
- c. To enable the IHO to present clear priorities for capacity building action to the UN and subordinate technical organizations and funding agencies, and to national governments.
- d. To enable Regional Hydrographic Commissions (RHCs) to establish a suite of capacity building initiatives and a prioritization process for regional cooperative efforts.
- e. To enable RHCs, where significant progress is required, to develop a holistic approach to capacity building, designed to deliver wide ranging assistance with sustainable outcomes. This would include training, technical cooperation, organizational and structural advice which may be part of a donor programme.
- f. To implement appropriate management of an IHO Capacity Building Fund.
- g. To produce and maintain an auditable IHO Capacity Building Management Plan.
- h. To support e-learning activities, considering the importance of practical exercises (or face-to-face) aspects required by the nature of hydrography.

## **Article 3 – PROCESS**

### The 4 steps in the process

16. The CB Procedures approved by the CBSC contain the detailed information necessary to plan and execute the CB Projects, and are published in the IHO website (<https://iho.int/en/miscellaneous-2>)

17. The IHO CBSC recognises that the first step must be the raising of awareness of the significance and impact of hydrography on maritime safety, at the highest political levels in each country, and in the UN and subordinate technical organizations, regional maritime associations and funding agencies. Without this, adequate resources will not be secured and sustained for the implementation of the strategy. Assessment is underway on a permanent basis through the revision and update of C-55 and through technical visits. The subsequent



steps of analysis, including prioritisation and identification of actions, and then the management and implementation of appropriate actions, require more detailed development within this policy paper and are itemised below. The degree of engagement required from each contributor to the process is suggested in Table 1.

Table 1: *Degree of engagement (X = Low, XX = Medium-low, XXX = Medium-high, XXXX = High)*

	<b>IHO</b>	<b>CBSC</b>	<b>RHC</b>	<b>Country</b>
<b>Awareness</b>	XXX	XXXX	XX	X
<b>Assessment</b>	X	XXX	XXXX	XX
<b>Analysis</b>	XXXX	XXX	XX	X
<b>Action</b>	X	XX	XXX	XXXX

18. The process will require development of the following elements:

- a. Intensification of efforts to raise awareness of hydrography and to provide reference documents on the minimum requirements for national hydrographic services in accordance with SOLAS Chapter V Regulation 9.
- b. Implementation and management of a CB fund.
- c. Completion of the revision of the C-55 database to identify key deficiencies.
- d. Development of assessment criteria to determine appropriate and sustainable national capacity.
- e. Implementation of effective RHC processes for analysis and prioritisation of capacity building needs within the region.
- f. Definition of an Action Plan to address selected goals within specific timescales, and to identify and manage funding.

19. In some RHCs, it may be appropriate to consider a comprehensive, multi-year, programme of work, including multiple projects. This may include precise assessment of the first priority requirements, definition of the target capacity, identification of complementary funding, installation and coaching of an organization, training, delivery of some equipment etc. These actions should be conducted in a strongly integrated way, in order for each project to contribute as a part of a holistic programme. A rigorous project methodology should be applied, to ensure successful implementation in terms of scope/budget/timeframe and monitoring/reporting to ensure the expected benefits are realised.

20. RHCs may also consider the adoption of a CB maturity model where the aspirations of nations can be assessed against each of the 3 CB Phases of development as defined in M-2 and shown in Figure 1. Such a model would identify the appropriate training/assistance/funding required to provide a clear pathway and action plan for a nation to achieve each CB Phase in a sustainable and enduring manner. The model may be used by RHCs to monitor and record a nation's progress towards the creation of a national hydrographic service. This information could become part of a comprehensive country profile as mentioned in Chapter 4.1. The successive steps in the process are outlined in the paragraphs which follow. The CB Procedures approved by the CBSC contain the detailed information necessary to plan and execute the CB Projects, and are published in the IHO website ([www.iho.int](http://www.iho.int) > Capacity Building).

### Raising Awareness

21. The IHO Secretariat should continue the campaign for the establishment of the hydrographic services required to meet obligations under UNCLOS and SOLAS. The high profile which the IHO Secretariat has sustained in the UNICPOLOS process, and within the IMO, should assist the CBSC to implement specific actions to target subordinate international and regional agencies. Very significant progress has been made in IMO, and the imminent inclusion of the C-55 database in the IMO Member State Audit Scheme (VIMSAS) will provide effective leverage to commit governments to resource the arrangements required under SOLAS V Regulations 4 and 9.

22. The Marine Spatial Data Infrastructure (MSDI) provides a framework for the provision of hydrographic information beyond the traditional field of surface navigation. The IHO/CBSC should contribute to raising the consciousness among the HO's of the importance of hydrographic data in order to drive "The Blue Economy" and all it signifies, in terms of economic and socio-economic development.

23. The CBSC should continue to explore the best means of raising awareness of the importance of hydrography to the funding agencies. The urgency of this task is underlined by increasing evidence of international and regional investment in hydrographic equipment for either marine scientific research or protection of the marine environment, without adequate awareness of measurement criteria for data to support safe navigation.

24. Raising awareness may be efficiently supported by a risk assessment process, based on the status of hydrographic knowledge, the main characteristics of maritime activities, including shipping, and of their evolution, and an impact study of the consequences of insufficient hydrographic knowledge or services.

25. M-2 is available, free of charge, together with a general IHO Information Brochure and IHO PowerPoint presentation, on the IHO website ([www.iho.int](http://www.iho.int)). These are important tools for meetings at ministry level during technical advisory visits, and are continuously updated.

### Assessment and Analysis of Needs

26. A further developed C-55 as a "country profile" will play an even more important role in Capacity Building.

27. The C-55 data-base on the IHO website contains tables of MSI, survey and charting information for each coastal state or state with hydrographically significant waters. The standard formats for the agendas of the IHO RHCs, and for the National Reports presented to them, provide for the regular review of this information and for the discussion of capacity building initiatives to improve the situation in each country. The main deficiencies in complying with SOLAS V Regulation 4 and 9 in many coastal states are as follows:

- a. No effective organization for the promulgation of information of importance to safe navigation and the protection of the maritime environment, either as navigational warnings or as inputs to NAVAREA Coordinators and those hydrographic offices with responsibility for charting;
- b. Outstanding actions to implement the GMDSS;
- c. No capacity to plan and implement a prioritised survey programme, including a resurvey component;

- d. Failure to apply IHO S-44 criteria in Marine Scientific Research and offshore industrial surveys;
- e. The lack of measures to ensure scientific & commercial survey data being incorporated in national bathymetric database;
- f. Lack of chart information on datum transfer parameters for GPS navigation; and,
- g. Lack of INT paper charts and ENC to support international navigation, especially in dangerous and VTS areas.

#### Technical Visits

28. Technical visits provide a powerful means of working with local administrators and experts to determine the arrangements for delivering SOLAS V obligations which are appropriate and sustainable for their country. Follow up visits may be required to support the recipient of the technical visit to implement the recommendations to establish hydrographic services.

#### Risk Assessment

29. A risk assessment provides a robust basis for prioritising a national/regional charting programme. The risk analysis methodology is evidence-based and objective against set criteria. It includes AIS traffic analysis and an economic assessment. The main output is a risk heat map which allows governments, charting authorities and other interested parties to come to a conclusion about the nature and scope of charting improvements and related maritime safety initiatives. A GIS is used for the analysis and to display the results. This allows complex data to be easily accessed and understood by key stakeholders to aid decision making and presents a compelling case for action.

#### Mechanisms for Action

30. The following mechanisms are available for capacity building action:

- a. Contact with decision-makers and advice to national experts:
  - i. IHO input to projects championed by IMO and other organizations;
  - ii. IHO advisory visits;
  - iii. RHC Visit Teams;
  - iv. Technical Workshops.
- b. Technical assistance. IHO and RHC assistance in coordination of regional survey, charting and MSI projects, including advice on liaison with funding agencies and with industry.
- c. Bilateral assistance by other IHO MS, by MOU, or on contract or aid-funded basis:
  - i. provision of SOLAS-compliant hydrographic services by other MS through legal administrative arrangement;
  - ii. loan of skilled staff;
  - iii. training, including options in region;
  - iv. output-based project assistance, with out-sourcing fully evaluated and exploited;
  - v. appropriate and sustainable skill and technology transfer, including advice on organization and planning as well as support for practicing hydrography.

31. Specific regional comprehensive programmes, as mentioned in Chapter 5, may be prepared by a study, possibly outsourced, on the feasibility of building a generic multi-year CB programme, taking into account sustainable expected progress, funding sources and their availability, possible synergies with complementary international cooperation programmes, languages issues and the level of commitment of concerned nations.

## Article 4 – MANAGEMENT

### Management of Capacity Building Action

32. The CBSC has established an IHO Capacity Building Fund (CB Fund). All transactions are transparent. Any donor may pledge funding for a particular purpose or project if desired.

33. The disbursement of the IHO CB Fund is controlled by using a costed Management Plan to derive annual Work Programmes. It enables the CBSC to assess and prioritise proposals submitted through the RHCs, and to approve appropriate responses for which costs and benefits have been balanced. Further details are given in the relevant Procedures.

### Training methodologies and cooperation

34. Training is a very important part of the IHO CB. The methodologies and the means of cooperation with training facilities play an important role in the success of funded trainings. The following list encompasses the main rules and fields of work for the capacity building efforts of the IHO:

- a. Maritime Safety Information (MSI) will be given priority in order to achieve the first long term objective of this Strategy, based on a multi-year MSI CB Plan to be developed jointly by the CBSC and World-wide Navigational Warning Service Sub-Committee (WWNWS);
- b. CAT A and B – Depending on funding, consideration will be given to using IHO funds for CAT A and B survey training and CAT B cartography training for candidates from MS only.
- c. Training for the trainer (TFT), to improve the availability of trainers within a region or country.
- d. Standardization of trainings beyond CAT A and B where feasible, providing a structure of training possibilities for certain topics.
- e. MSDI training – MSDI Courses will be developed to cater for the different requirements of the various phases of Hydrographic development.
- f. Ensuring that syllabi of trainings are widely available, preferably in different languages.
- g. Investigation of the practical benefit and a possible implementation of blended and e-learning.

### Cooperation with Stakeholders

35. The CBSC works closely together with stakeholders, such as Nations, international and regional organizations and Non-Governmental Organizations (NGOs) to find a broad basis for the cooperation for the benefit of the IHO CB Strategy.