Minutes of the 23rd North Indian Ocean Hydrographic Commission (NIOHC) Meeting

Date: May 21-23, 2024 **Location:** Chiang Mai, Thailand

Agenda 1: Opening Session

1. NIOHC Members, Observers, IHO Director, Relevant Organizations and Industrial companies joins together in the 23rd NIOHC conference At Kantary Hills Hotel, in Chiang Mai, Thailand. List of Participants is attached in Annex A.
2. The meeting commenced with introductory remarks from the MC, Lt. Nuttachai (Thailand).
3. A warm welcome was extended to all delegates, both in-person and online, on behalf of the Hydrographic Department of the Royal Thai Navy and the government of Thailand.

Agenda 1.1: Chairmanship Handing Ceremony

1.1.1 Commodore Dyan Primana Sobaruddin (Indonesia) delivered a farewell address on behalf of the outgoing Chair, Admiral Harjo Susmoro (Indonesia), who was unable to attend due to prior commitments. Cdre. Sobaruddin highlighted the achievements of the Indonesian chairmanship (2020-2024), which included:

Hosting the 21st and 22nd NIOHC meetings in Bali (2021) and Jakarta (2023), respectively.

Implementation of various capacity-building programs, such as seminars, workshops, and training courses focused on raising awareness of hydrography, ENC production, and MSI.

Progress on the IHO Strategic Plan and measuring regional strategic performance indicators.

1.1.2 Cdre. Sobaruddin formally handed over the NIOHC flag to the incoming Chair, Vice Admiral Komsan Klinsukon (Thailand).

1.1.3 Vice Admiral Komsan Klinsukon expressed gratitude for assuming the leadership role and emphasized the NIOHC's commitment to regional cooperation, capacity building, and the adoption of innovative hydrographic technologies.

Agenda 1.2: Welcome Address by the New Chair

1. Vice Admiral Komsan Klinsukon delivered a welcome address, emphasizing the vital role of hydrography in maritime safety, trade, environmental protection, and sustainable development.
2. He acknowledged the diversity and potential of the NIOHC region and encouraged collaboration among Member States.
3. A moment of silence was observed to honor the victims of the recent tragic loss of a Malaysian Navy helicopter and devastating floods that struck Indonesia's West Sumatra Province.

Agenda 1.3: Opening Remarks by the IHO Director

1. Dr. John Nyberg, Director of the IHO, provided an overview of the global hydrographic landscape, highlighting its critical importance in a rapidly changing world.
2. He emphasized the relevance of hydrography to the UN Sustainable Development Goals, the Decade of Ocean Science for Sustainable Development, and the UN Integrated Geospatial Information Framework.
3. Dr. Nyberg highlighted the implementation of the new S-100 Universal Hydrographic Data Model as a key priority for the IHO, emphasizing the need for international collaboration and a country-driven approach.

Agenda 2: Administrative Matters

1. Lt. Nattachai (MC) provided administrative details regarding accommodation, local currency, weather, meals, transportation, and meeting room facilities.

Agenda 3: Adoption of the Agenda and Timetable

1. The proposed agenda and timetable for the meeting were reviewed and adopted by the delegates.
2. The Chair outlined the schedule for the day, including a group photo session, discussions on IHO matters, national reports from Member States, and a welcome dinner.

Agenda 4: Adoption of 22nd NIOHC Minutes

1. The conference adopted the minutes.

Agenda 5: Review of Action Items from 22nd NIOHC meeting

1. The Chair led a review of outstanding action items from previous NIOHC meetings.
2. Delegates discussed the status of each action item, updating deadlines as needed and assigning responsibility for follow-up.

Agenda 6: Group Photo

1. Delegates assembled for a group photo session. The Groups Photo is attached in Annex B.

Agenda 7: IHO Matters

1. Dr. Nyberg (IHO) presented a report outlining recent IHO activities, key decisions, and recommendations relevant to the NIOHC region.
2. The report focused on:
    - The importance of Member State participation in IHO standards and circular letters, particularly those related to S-100 implementation.
    - Opportunities for training and capacity building, including the Empowering Women in Hydrography project, the Master of Science program at the University of Southern Mississippi, the IHO-Nippon Foundation GEOMAC project, and the Graduate Certificate program in Ocean Bathymetry at the University of New Hampshire.

- Upcoming events, such as the IHO-IALA S-100 Workshop in Annapolis, Maryland (September 2024) and the GEBCO Week in Fiji (November 2024).
- The need for regular updates to the IHO Yearbook (P-5) and C-55 (Status of Hydrographic Surveying and Charting Worldwide).
- Recommendations from the IHO WEND Working Group (WENDWG) on the S-100 Implementation Roadmap, the importance of engaging end users, and the need for a comprehensive communication strategy.
- The ongoing review of the IHO Strategic Plan and the call for Member State inputs.

Agenda 8: National Reports

- **8.1A. Bangladesh:**
    1. Highlighted ongoing hydrographic and oceanographic surveys, chart production, and efforts to enhance maritime safety.
    2. Emphasized the challenges posed by rapid changes in the coastline due to sedimentation, the need for modern equipment and technology, and the importance of capacity building.
    3. Discussed the transition to S-100, the development of a national spatial data infrastructure, and the need for international collaboration and assistance.
- **8.1B. India:**
    1. Presented a comprehensive report on India's extensive hydrographic capabilities, including survey vessels, equipment, training programs, and international collaborations.
    2. Showcased its contributions to regional capacity building and its role in supporting maritime safety through MSI services.
    3. Discussed its involvement in Antarctic expeditions and the production of charts for these regions.
- **8.1C. Indonesia:**
    1. Presented an overview of its hydrographic activities, emphasizing its role in supporting maritime safety and economic growth.
    2. Highlighted the importance of capacity building and technical standards, particularly in relation to S-100 implementation.
    3. Shared its experiences with recent hydrographic surveys, wreck investigations, and the use of multibeam sonar technology.
    4. Discussed the challenges of deep-water surveying and the importance of international collaboration for data sharing and technical expertise.

- **8.1D. Myanmar:** (online)
    1. Reported on its recent hydrographic survey activities and highlighted the challenges of obtaining after-sales service and technical support for its multibeam sonar systems.
    2. Made a strong call for the development of a regional regulation to guarantee reliable after-sales service for hydrographic equipment, particularly for developing nations.
    3. Emphasized the importance of this issue for fulfilling the IHO's primary goals of safety of navigation and the protection of life at sea.
- **8.1E. Pakistan:**
    1. Outlined its hydrographic activities, including survey operations, chart production, and MSI services as the NAVAREA IX coordinator.
    2. Discussed challenges related to workforce capacity, crowdsourced bathymetry implementation, and the development of a national spatial data infrastructure.
    3. Highlighted the ongoing transition of its hydrographic office from a department within the Navy to a national organization.
- **8.1F. Saudi Arabia:**
    1. The Hydrographic office works to improve performance, quality and safety.
    2. The office has produced a large number of ENC's and paper charts.
    3. The Office is working with the Ports Authority.
    4. Produced a national tide table for both digital and analog.
    5. The Office works on capacity building and also oceanographic activity.
    6. The office is preparing for an international meeting in October/November.
- **8.1G. Sri Lanka:**
    1. Announced the establishment of a new National Hydrographic Office.
    2. Shared information on ongoing hydrographic charting and data management initiatives.
- **8.1H. Thailand:**
    1. Highlighted its hydrographic survey activities and commitment to maritime safety.
    2. Presented its participation in international events and collaborative hydrographic projects.
- **8.1I. United Kingdom:**
    1. Outlined hydrographic activities within the region.

2. Underscored the UKHO's commitment to S-100 implementation and ongoing capacity-building programs.

- **8.2A. Australia:**
    1. Presented its innovative Hydrographic Scheme Industry Partnership program, collaborative survey efforts, and participation in capacity-building programs like the Southwest Pacific Hydrographic Commission's Hydrographic Leaders program.
- **8.2B. France:**
    1. Shared its hydrographic survey activities in the region and progress in modernizing charting processes.
    2. Expressed its support for international collaboration and capacity building.
- **8.2C. Oman:**
    1. Outlined its current hydrographic activities, progress in upgrading its MSI infrastructure, and efforts to enhance capacity within its hydrographic service.
- **8.2D. United States:**
    1. Provided updates on its hydrographic activities, including the ongoing transition to S-100 and commitment to international hydrographic cooperation.

- End of Day one -

Welcome Dinner

1. Delegates enjoyed a traditional Thai dinner at the Kantary Hills Hotel, followed by a cultural performance.

Agenda 9: NIOHC Committee and Working groups

Agenda 9.1: NICCWG (North Indian Ocean Charting Working Group) Report

1. India, the Chair of the NICCWG, presented a detailed report covering:
    - The status of the INT (International) chart scheme for the NIOHC region, highlighting chart coverage, new charts, and updated editions.
    - The distribution of ENC cells by user band and contributing Member States.
    - Outstanding action points from the previous meeting, including pending issues related to proposed charts for Sri Lanka and Bangladesh.
    - Progress on the development of an INT chart grid scheme for user bands 1 and 3, following IHO recommendations.
    - A draft plan for S-100 implementation within the region, focusing on capacity building, technical standards, and coordination.
    - Recommendations for the establishment of an S-100 working group within the NIOHC, the active participation of Member States in product specification development, and the sharing of national S-100 roadmaps.

Agenda 9.2: NIOHC Capacity Building Coordinator Report

1. UK, the NIOHC Capacity Building Coordinator, presented a comprehensive report, focusing on:
    - Recent CBSC meetings and their key outcomes, including discussions on funding for capacity building activities.
    - Significant contributions from Member States and industry partners to support capacity building initiatives.
    - The establishment of an IHO Funding Generation Team to explore alternative funding sources.
    - Updates on the Empowering Women in Hydrography (EWH) project, including recent opportunities and a new UK-funded initiative to support women's participation in hydrography.
    - The development of the IHO E-Learning Center and the need to identify a general manager.
    - The successful MSI course conducted in Oman in 2023 and plans for a second course focusing on succession planning.
    - A summary of the NIOHC Capacity Building Work Plan for 2024 and proposed actions for 2026.

    Discussion on Action Items

1. Following the CBSC report, delegates engaged in a discussion regarding the numerous and sometimes overlapping action items related to capacity building.
2. The Chair encouraged Member States to review the action list, provide suggestions for improvements, and prioritize key initiatives.

Agenda 9.3: IRCC-15 (Inter-Regional Coordination Committee) Report

1. India presented the key points and action items arising from the 15th IRCC meeting held in Tokyo, Japan, in June 2023.
2. The report highlighted recommendations and actions for the NIOHC, including:
    - The appointment of MSDI ambassadors and increased participation in the CSBWG.
    - Encouraging Member State and stakeholder contributions of bathymetric data to the DCDB.
    - Discussions on the future of paper products and requirements for non-ECDIS mandated vessels.
    - Establishing the role of an S-100 Regional Coordinator and participating in the IHO Project Team on Fund Generation of Project Initiatives.

- Initial planning for the development of a revised IHO Strategic Plan in preparation for the IHO Assembly in 2026.
- Encouraging Member States to submit papers to the International Hydrographic Review (IHR).
- Ensuring Member States report to the IMO and the EGC Coordinating Panel on the progress of implementing newly recognized mobile satellite services by MSI providers.

Agenda 9.4: MSDIWG (Marine Spatial Data Infrastructure Working Group) Report

1. Sri Lanka, the Chair of the MSDIWG, presented a report on the importance and development of MSDIs in the region.
2. The report highlighted:
    - The benefits of MSDIs for sustainable maritime development, data sharing, and improved decision-making.
    - The progress of various Member States in establishing national MSDI frameworks.
    - The challenges of stakeholder coordination, governance, data availability, and legal frameworks related to data sharing.
    - Proposed actions for the working group, including increasing membership, conducting workshops, updating the work plan, and preparing for the next NIOHC meeting.

Agenda 10: Relevant International Organization Reports

Agenda 10.1: CSBWG (Crowdsourced Bathymetry Working Group) Report

1. India, the NIOHC CSB Coordinator, presented a detailed report covering:
    - The value and importance of crowdsourced bathymetry for supplementing traditional hydrographic surveys, filling data gaps, and identifying changes in charted areas.
    - The IHO Publication B-12, which provides guidelines and best practices for CSB data collection and contribution.
    - The role of the Seabed 2030 project in providing data loggers and facilitating data sharing.
    - Resources and tools available from the University of South Florida and NOAA to support CSB data processing and integration.
    - The development of a CSB Coastal State Review application to automate data approval processes.
    - Challenges related to data quality, data sharing policies, and integrating CSB data into official hydrographic products.

Agenda 10.2-10.3: WENDWG and IHO Council Reports

1. India provided a combined presentation summarizing recent IHO meetings and highlighting key outcomes and recommendations from the IHO Council (C-7) and the WEND Working Group (WENDWG-14).
2. The report covered:
    - The establishment of national S-100 committees, the development of S-100 implementation strategies, and the operationalization of phase one S-100 standards.
    - The Champion of Hydrography Award and the call for Member State nominations.
    - The IHO's work on gender balance in hydrography and the development of a regulatory framework for this initiative.
    - Upcoming workshops on S-100 standards and crowdsourced bathymetry.
    - The IHO budget for 2024 and the call for Member State contributions.
    - The WENDWG's work on the S-100 Implementation Roadmap, the Dual Fuel Concept for ECDIS, and challenges related to S-101 ENC production.
    - The International Hydrographic Review (IHR) and the call for Member States to submit articles for publication.

Agenda 10.4: Seabed 2030 Project Presentation

1. Dr. Vicki Ferrini (Columbia University), representing the Seabed 2030 project, delivered a comprehensive presentation highlighting the project's goals, methodology, and progress.
2. The presentation covered:
    - The diverse uses of bathymetric data and its importance for sustainable ocean management, scientific research, and the UN Decade of Ocean Science for Sustainable Development.
    - The role of GEBCO in providing authoritative bathymetric data sets and the project's focus on achieving complete ocean mapping by 2030.
    - The project's regional approach to data collection and coordination, with centers distributed around the world.* The importance of data sharing, collaboration, and partnerships across various sectors, including government agencies, industry, academia, and the public.* Emerging technologies and solutions contributing to the project's goals, such as transit data acquisition, satellite-derived bathymetry, and crowdsourced bathymetry.

Agenda 10.5: IALA Report

1. IALA-IHO S-100 Workshop: There's a mention of the "second IHO IALA S-100 workshop" to be held in Annapolis, Maryland, in September. This is highlighted as an excellent opportunity to work "outside" of the hydrographic community, with an organization that has

adopted the S-100 standards and is looking to implement them with respect to Aids to Navigation (AtoN). IALA is looking for opinions on how to implement these standards in a way that will benefit chart production.

2. AtoN Data: The workshop is also of interest to those responsible for maintaining Aids to Navigation and who are working to develop a standard for maintaining AtoN data. It's a chance to participate in the development of standards in the "ISO Standard format".

3. Good Representation: The speaker expressed a desire to see good representation from around the world at the Annapolis workshop.

Agenda 10.6: **IC-ENC (International Centre for ENCs) Report Summary:**

This section focuses on a presentation about IC-ENC and its role, services, and future development. Key points include:

- **Membership and Reach:** IC-ENC has 50 member nations and is a non-profit organization operated on behalf of its members. It has offices in various regions and works to provide a truly global service.
- **ENC Coverage:** IC-ENC's database contains over 13,000 ENCs, and they represent well over half of the world's ENC coverage.
- **Recent Activities:** They have released over 14,000 ENC updates in the past year, and continue to welcome new members into the organization.
- **Data Flow:** IC-ENC acts as a hub for data, taking ENC data from member nations, validating it, then distributing it to commercial and governmental users. They handle revenue management and payments back to data owners which simplifies the process for hydrographic offices.
- **Validation Tools:** IC-ENC provides members with in-house tools for validation and quality control. They are upgrading these tools to handle S-100 data as well. These tools allow for parallel validation of S-57 and S-101 data.
- **S-100 Services:** IC-ENC launched an operational S-100 service in 2020 (distributing S-102 and S-111). They are now ready to receive S-104 data. They emphasize the importance of developing a system that includes all S-100 data (not just S-101) to make the new standard attractive to mariners.
- **Training Portal:** They have developed a training portal to help hydrographic offices with S-100 standards including S-101 and S-104, offering various modules and practical exercises. The courses can lead to a certificate. The portal is available to member and non-member states.

- **S-100 Explorer:** IC-ENC is developing a web-based tool called the "S-100 Explorer" that will allow users to view and interact with different types of S-100 data, helping them understand how different layers relate to one another.
- **Navy Supplier Service:** IC-ENC offers a service for national navies that allows them to distribute data to their users, set discounts, and track usage.
- **Opt-in Fund:** IC-ENC has an "Opt-in Fund," where members can donate a small percentage of their ENC revenue to fund projects for development, capacity building etc., within IC-ENC's programs. They are open to proposals from the NHO region for projects. The fund has already generated around $500,000 USD in its first year.
- **Collaboration:** IC-ENC is open to new members and partners and is committed to working with the member states and community,
- **Data Protection Scheme:** Primar support IO operation of being a data protection scheme administrator for S-100 data.

Agenda 10.7: PRIMAR Presentation

1. Norway, representing PRIMAR, the IHO Data Centre for Digital Bathymetry, delivered a presentation outlining PRIMAR's services and capabilities.
2. The presentation focused on:
    - PRIMAR's role in providing a consistent and reliable ENC service worldwide, ensuring compliance with IHO standards.
    - The PRIMAR data distribution system, including its network of commercial and governmental distributors, data validation procedures, and revenue management services.
    - The transition to S-100 data handling, including the development of validation tools and an operational S-100 service.
    - The PRIMAR Training Portal, which offers training modules on S-100 standards and ENC production.
    - Ongoing projects to enhance PRIMAR's capabilities, including upgrading systems to handle S-100 data, developing the S-100 Explorer tool, and expanding partnerships.

Agenda 11: Maritime Safety and Worldwide Navigational Warning Service

1. Representatives from NAVAREA VIII (India) and NAVAREA IX (Pakistan) delivered reports on their respective maritime safety information services, covering:
    - Their areas of responsibility and the types of information disseminated.
    - Communication methods, including Inmarsat broadcasts, NAVTEX, and online platforms.

- The number and types of messages transmitted, highlighting trends and sources of information.

- Backup arrangements with other NAVAREAs to ensure continuous service in case of system outages.

Agenda 12: Bangladesh Present Hydrographic School

1. The Bangladesh Hydrographic School presented a detailed report on its training programs, facilities, and achievements, highlighting:
    - Its IHO recognition for providing Category B hydrographic surveying courses.
    - The number of officers and sailors trained from Bangladesh and other countries.
    - Its modern equipment, software, and survey vessels used for practical training.
    - Its aspiration to become a regional hub for hydrographic training and the invitation for officers from friendly countries to enroll in its courses.

Agenda 13: Industrial Presentation

1. Several Industrial companies/organizations such as Teledyne, SevenCs, Kongsberg, Fugro, Skilltrade, AUSPAC and Maritime Solutions have present their products and services to all members and observers.

Agenda 14: Regional Issues:Challenges

The meeting highlighted several recurring challenges and issues faced by the hydrographic community, often with a regional context. Here are the main themes:

1. **S-100 Implementation Challenges:**
    - **Lack of Clarity on Standards:** There is still a need for clarity on what constitutes "standard navigation equipment" when it comes to crowdsourced data, and what should be used for official charting data. This is a concern because data might be collected using varied equipment and this may create a lack of international standardization that creates further complications.
    - **Dual Fuel Concept:** A working group noted that there are delays with the discussion between members about how to approach their dual fuel concept. The meaning of the dual fuel concept wasn't very clear in the report.
    - **Delays in Standards Development:** Some RHC's are experiencing delays due to the S-101 standard still being in draft form. This is hindering design and production, particularly with vendors that will need time to adapt to the changes. This could cause delays to meeting the S-101 rollout date.
    - **Data Availability:** Ensuring that the underlying data is available for S-100 standards, regardless of who produces the end product, is seen as a major hurdle.

- **Need for Coordination:** The need for a regional approach for the S-100 transition, with a clear plan and strategy, is recognized.

2. **Data Sharing and Governance:**
    - **Data Sharing Policies:** Different countries have their own data-sharing policies, creating an obstacle to collaboration and the integration of data from different sources. This issue includes what data they should share and what data can be used.
    - **MSDI Development:** The development of Marine Spatial Data Infrastructures (MSDI) is hampered by the need for stakeholder coordination and government buy in. Legal concerns, data quality, and issues related to data availability, security and privacy are major issues.
    - **Crowdsourced Data Concerns:** Concerns exist regarding the quality of crowdsourced data and how it will be handled by hydrographic offices in particular, especially given issues of data validation and who is responsible for it. These concerns are also related to policy and governance and how to integrate crowdsourced data into official hydrographic products. There also seems to be an issue of how to use the data from the crowdsourced data (including what equipment is approved) and how it can be used across different zones and the implications for mariners.
3. **Capacity Building and Training:**
    - **Funding Opportunities:** There's a need to identify other funding sources to support hydrographic training, particularly when it comes to specific requirements for courses and training with modern S-100 technology. There are funding resources, but it is a problem for different regions to apply for them.
    - **Access to Training:** Access to training, especially higher-level category A courses, is still a problem, which leads to the lack of qualified personnel to perform the task that is needed of a hydrographic service.
    - **Practical Experience and Exposure:** There is a need for the training to not only be theoretical, but also provide the trainees with practical experience.
    - **Succession Planning** There's a need to develop a pipeline to train the next generation of hydrographers.
4. **MSI and Safety Information:**

- **Coordination of MSI:** A need for better coordination of Maritime Safety Information (MSI) is needed from national coordinators. There is a need to update the navigational systems to keep the region safe for mariners.
- **Operation of Stations:** There is some problems relating to some nations not being able to operate their NAVTEX and other MSI related stations.

5. **Regional Hydrographic Cooperation:**
    - **Membership and Participation** There are still some regions that need to increase their membership of different hydrographic committees and working groups.

Notes :

- **Varying Progress:** It's evident that different countries in the region are at different levels of development when it comes to their hydrographic capacity, infrastructure, and data management.
- **Balance of Priorities:** There's a tension between the need to modernize with technology and the practical realities of working in a dynamic environment with often limited resources.
- **Importance of Collaboration:** The need for regional and international collaboration is a recurring theme, with Member States seen as active participants in overcoming the challenges.

6. Action Plan Development & Discussion

1. Delegates engaged in a comprehensive discussion to develop a detailed action plan for the NIOHC based on the key themes and recommendations emerging from the meeting.
2. The action plan incorporated:
    - Strategies to enhance data sharing and contributions to regional and global databases, including bathymetric data, tidal data, current data, and ENC information.
    - Actions to promote and support Crowdsourced Bathymetry, addressing legal and regulatory barriers and encouraging Member States to respond to the CSB questionnaire.
    - Plans to transition to electronic charting and digital products, addressing the future of paper charts, and considering requirements for non-ECDIS mandated vessels.
    - Steps to support the implementation of S-100 standards, including the establishment of an S-100 working group, the appointment of an S-100 Regional

Coordinator, participation in S-100 training and workshops, the development of national S-100 roadmaps, and coordination with industry partners.

3. Actions to advance the development and implementation of MSDIs, including increasing membership in the MSDIWG, conducting regional workshops, addressing challenges related to data sharing and governance, and promoting awareness of MSDI benefits.
4. Strategies to strengthen regional capacity building, including identifying training needs, exploring funding opportunities, and leveraging partnerships with IHO member states, industry organizations, and academic institutions.
5. Measures to improve Member State engagement in IHO activities, such as contributing to IHO publications, participating in working groups and technical committees, and fulfilling reporting requirements.
6. Discussions on long-term strategic planning for the NIOHC, including initiating preparations for the development of a revised IHO Strategic Plan and addressing the potential role of hydrography in climate change mitigation and adaptation.

Agenda 15: NIOHC Input to IHO Meeting

NIOHC Report to IRCC-16 and 8th IHO Council Consideration have include in the attached document in Annex C.

Agenda 16: Approval of the Action list

The Action List has been review, revised and approved As appear in the attached Document in Annex D.

Agenda 17: Date and Venue of the Next Meeting

- The dates and location for the 24th NIOHC meeting were confirmed to be held in Bangkok, Thailand.

Agenda 18: Closing Remarks

- The incoming NIOHC Chair, Vice Admiral Komsan Klinsukon (Thailand), summarized the key outcomes and achievements of the meeting.
- He thanked all participants for their active engagement and contributions, emphasizing the spirit of collaboration and knowledge sharing that characterized the meeting.
- **The meeting was closed.**