



# 16<sup>th</sup> NORTH INDIAN OCEAN HYDROGRAPHIC COMMISSION CONFERENCE

Chittagong, Bangladesh  
14-16 March 2016

## Draft Minutes v1

### 1. Opening Ceremony

#### 1.1 Opening Remarks by the Chairman

At the outset, Chairman North Indian Ocean Hydrographic Commission (NIOHC), Rear Admiral M Makbul Hossain welcomed all at the inauguration ceremony of 16th Conference. He thanked the assembly of colleagues and friends from around the world for making their efforts to travel all the way to the port city Chittagong. He also expressed gratitude to the Chief of Naval Staff of Bangladesh Navy, Vice Admiral Nizamuddin Ahmed for kindly inspiring the participants by gracing the occasion as Chief Guest.

The Chair gave a short glimpse of the importance of hydrography for Bangladesh. The geo-strategic location of the Bay of Bengal makes Bangladesh a very important partner in the Indian Ocean Region, where sea can be used as an instrument for regional connectivity.

He mentioned that as per the SOLAS convention, all coastal states are required to provide and maintain Hydrographic Services and products for their sea area. Bangladesh Navy (BN), as a responsible agency, conducts all the hydrographic surveys at sea and fulfils the obligatory requirement of SOLAS convention on behalf of the government of Bangladesh.

The Chair expressed that Bangladesh is very proud to host this annual conference of NIOHC in Chittagong. He sincerely expressed gratitude and thanks to honourable delegates for entrusting Bangladesh with the responsibility to chair the conference and accepting invitation to come to Bangladesh for attending this important event. He looked forward for an effective meeting through interactive and successful discussion, which would ultimately help to strengthen the bondage to work together towards achieving common goal for NIOHC in particular and for the IHO as a whole.

#### 1.2 Opening Remarks by Director IHB

Rear Admiral (Retd) Mustafa Iptes (Director, IHB) highlighted that Regional Hydrographic Commissions (RHC) are very important elements of hydrographic activities, which are established for coordination and cooperation in regional basis. He recognized that the spirit of the RHCs is of technical, cooperative and collaborative in nature. IHO encourages and supports the activities of RHCs in coordinating hydrographic and nautical charting services on a regional basis under the umbrella of Inter Regional Coordination Committee (IRCC). NIOHC is one of the biggest RHC, which is located in strategically and economically important region of the world. He observed the

increased communication and coordination among the NIOHC Member States since 2015, which is of course a positive outcome of the regional meetings and other regular IHO events.

He also observed the increasing involvement of hydrographic industry, academia and sister maritime organizations to the RHC meetings as to develop the hydrographic and cartographic capability in the region. He underlined the roles and priorities of IHB as IHO outreach and raising awareness, capacity building, increasing IHO membership especially for significant IMO Flag States, MSDI and provision of geo-data, S-100 implementation and development, supporting implementation of e-Navigation and crowd-sourced bathymetry. He assured that IHB is always ready to support MSs for every matter, everywhere an every time. He urged MSs to continue to participate, host and also support the IHO events as much as possible.

He highlighted the presence of Vice Admiral Nizamuddin Ahmed, the Chief of Naval Staff of Bangladesh Navy, who gave a clear indication of Bangladesh's commitment with regard to hydrographic development and increasing role in this domain. He thanked BN Hydrographic Department for its strong willingness, enthusiasm and professionalism to organize the event in port city Chittagong.

### **1.3 Address by Chief Guest**

Vice Admiral Nizamuddin Ahmed, the Chief of Naval Staff of Bangladesh Navy, welcomed all the delegates to the 16th North Indian Ocean Hydrographic Commission Conference in the beautiful city of Chittagong having a long maritime heritage. He sincerely expressed his thanks and gratitudes to all members of the NIOHC for electing Bangladesh as the Chairman and choosing as the host of this important NIOHC Conference. He felt truly honored and highly delighted to be present in the auspicious inaugural ceremony as chief guest among the experts on hydrography.

He was extremely delighted to learn that as an integral part of IHO, NIOHC plays very vital role in promoting hydrographic activities in this region. It ensures regional co-operation and coordination with regards to nautical information, hydrographic surveys and production of nautical charts and publications. It also cooperates on technical assistance and training supports on various disciplines related to hydrography. He expressed that as a proud member of this commission, Bangladesh has firm and sincere commitment in all such activities.

He also mentioned that geographically, Indian Ocean is located at a strategic juncture. In this region, many of the world's important trade routes are situated. Bangladesh being a maritime nation, always recognizes the importance of hydrography and acknowledges the hard work and dedication set forth by the hydrographers to make the sea a safe place for the sea farers. The seas and oceans are now acknowledged as major contributors to the world economy and well-being. He highlighted the necessity of hydrographic information, which is very crucial for any use of these vast sea areas.

As a maritime nation, Bangladesh has special connotation to the term 'Blue economy'. Its maritime sector is one of the most thriving sectors to support the fulfillment of her millennium goals. The government also acknowledged the fact and emphasized using of this sector as a window of opportunity for development. He urged to have intelligent understanding of the term 'Blue economy' and explore its potential. He reminded that hydrographic works are the most fundamental of all the enablers required to develop and sustain the Blue Economy.

He wished that the conference would be very effective and successful, which would provide a better guidance and help to improve the quality of hydrographic activities ensuring effective use of the sea.

At the end he declared the 16<sup>th</sup> NIOHC Conference open.

#### **1.4 Administrative Arrangements**

Cdre Mahmudul Hassan, NIOHC Secretary, invited the host representative to provide the conference participants with the required administrative details. Cdr Firoz Ahmed (Bangladesh) briefed about logistic information and the program of the conference, including social gathering and the relevant venues.

The secretariat circulated a draft version of NIOHC16-01e (List of Participants) requesting participants to review and confirm the information contained is correct.

The Chair then requested all delegates to introduce themselves. He noted the absence of representative from Mauritius.

#### **1.5 Agenda and Timetable Approval**

The secretariat distributed the draft agenda (NIOHC16-01a) and timetable (NIOHC16-01c) through a folder to all delegates. Rear Admiral (Retd) Mustafa Iptes, Director IHB, stated that draft agenda item no 4 (Designating NIOHC representatives to the IHO Council) and amendments to the protocol of IHO council may be discussed on the following day (15 March 2016) as the MS need to go through the relevant draft text distributed to them. Rear Admiral Vinay Badhwar (India) informed that he will present the Mauritius National Report (Item no 6) and discuss the relevant Agenda (Item no 15) due to the absence of Mauritius in the conference. He also wanted to discuss the agenda item no 7.2 and 15 together. The Chair agreed to the change of draft agenda. Having no other points, the commission accepted the draft agenda and timetable.

#### **1.6 List of Documents**

The secretary informed the conference that the lists of documents are available in NIOHC website.

### **2. 15<sup>th</sup> NIOHC Minutes approval**

The secretary informed that the 15<sup>th</sup> NIOHC draft minutes was uploaded in the NIOHC website as well as circulated to the delegates. He asked the participants for their considerations.

Thailand proposed amendment to the agenda item 7.1 NICCWG of 15<sup>th</sup> NIOHC Minutes under paragraph "Thailand". The existing one would be replaced as stated below:

" Thailand suggested amendments to limits of their national chart 335A which is allocated as INT 7450 by region J and INT 5792 by region K, the NICCWG coordinator proposed that as the majority of the chart will be within region K it should be moved to the EAHC and thus region K; this proposal was agreed by the member states. It was then raised the same issue exists with INT 7033 (TH 362); as this chart will fall entirely within region K it should also be moved (Action item 15)."

The Thailand's amendment was accepted by the Commission. As there was no other point, the Commission approved the 15<sup>th</sup> NIOHC Minutes.

### 3. 15<sup>th</sup> NIOHC Conference Actions List Review

The secretary ran through the actions from the 15<sup>th</sup> NIOHC Conference. The status of the actions was updated in the table below:

No	Agenda Item	15 <sup>th</sup> NIOHC Action	Action By	Date	Status
1	5.1	Encourage IHO non-MS to apply for NIOHC associate membership and IHO membership	All	Ongoing	Ongoing
2	5.1	Accelerate the process of approval of amendments to the IHO Convention	Egypt, India, Myanmar and Thailand	As soon as possible	Ongoing
3	5.3	Provide the IRCC Chair with Progress reports on the relevant tasks of the IHO 2015 Work Programme	Chair	Jan 2016	Completed
4	5.3	Provide to the IRCC Chair the estimated values of SPIs and agreed WPIs as of 31 <sup>st</sup> December 2015 and target values for 31 <sup>st</sup> December 2017, complemented by the comments and the difficulties encountered and suggestions for a way forward.	MS/Chair	Jan 2016	Completed
5	5.9	Oman national Survey Authority and IIC to update NIOHC 16 on the outcome of the modernization of the local Omani geoid. NIOHC Chair to include on the NIOHC16 agenda.	Oman(tbc), IIC, Chair	NIOHC 16	Included in the Agenda
6	6	Bangladesh to write a paper with regards their experiences of surveying and charting a dynamic river environment for discussion at IRCC8.	Bangladesh	Mar 2016	Completed
7	6	Bangladesh to write a paper for inclusion in the International Hydrographic Review (IHR) on their experiences of surveying and charting a dynamic river environment.	Bangladesh	Sep 2016	Will be forwarded
8	6	Saudi Arabia to forward Survey Graphics to IHB for Inclusion in IHO database in conjunction with IRCC action 6/15.	Saudi Arabia	Aug 2015	Ongoing
9	7.1	INT Chart Producers to assess their allocated INT Charts within region J with regards last update and currency of data they contain. Provide information to NICCWG coordinator for review.	INT Chart producer nations	31 <sup>st</sup> Dec 2015	INT Chart Producer Nations to provide last updated data information in source diagram. On going

10	7.1	NICCCWG Coordinator to review data provided by INT Chart producers and present results to NIOHC16.	NICCCWG Coordinator	NICCCWG	Completed
11	7.1	NICCCWG coordinator to update S-11 for agreed limit amendment to INT 7425.	Bangladesh, India	15 <sup>th</sup> May 2015	Completed Will be covered by agenda 7.1
12	7.1	NICCCWG coordinator to provide 5 new INT numbers to Bangladesh in relation to the ports of Chittagong, Payra and Sonadia and to update S-11 accordingly.	India	15 <sup>th</sup> May 2015	Completed Will be covered by agenda 7.1
13	7.1	Pakistan is to notify the region I NICCCWG Coordinator (Iran) of the need to commence discussion with Region J INT Chart Coordinator to resolve the cross region coverage issue of INT 751.	Pakistan	Prior to RSAHC ICCWG meeting	Letter has been sent to RSAHC ICCWG Coordinator
14	7.1	NICCCWG Coordinator to report result of discussion to next NICCCWG meeting.	Region J INT Chart Coordinator.	NIOHC 16	Completed Will be covered by agenda 7.1
15	7.1	NICCCWG Coordinator to inform region K Coordinator of the intention to move both INT 7450/5792 and INT 7033 to region K scheme	NICCCWG Coordinator, Thailand	1 <sup>st</sup> April 2015	Information forwarded by NICCCWG Coordinator Thailand is waiting for chart allocation from region K
16	7.1	Sri Lanka to provide clarification of limits and national chart numbers to NICCCWG Coordinator for renumbering of their allocated INT chats	Sri Lanka	1 <sup>st</sup> April 2015	On going
17	7.1	NICCCWG Coordinator to supply INT numbers to Sri Lanka and updates S-11, part B, region to J with the amendments	NICCCWG Coordinator	15 <sup>th</sup> May 2015	After getting proposal from Sri Lanka, it will be done
18	7.1	NICCCWG coordinator to update S-11Part B, region J and provide to IHB	NICCCWG Coordinator	30 June 2015	Completed
19	7.1	IHB to assist in the resolution of NICCCWG issues that not can be resolved by NICCCWG	IHB, NICCCWG	On going	On going
20	7.2	Bangladesh to host ENC Quality Assurance training course and provide CB coordinator assistance in organizing	CB Coordinator/ Bangladesh	September 2015	postponed and re-scheduled for 2016 CB Work Programme
21	7.2	Update the NIOHC 5 year plan to include input from NIOHC15	CB coordinator	March 2015	Completed
22	7.2	Produce submissions from NIOHC to CBSC as per 5 year plan	CB coordinator	1 <sup>st</sup> April 2015	Completed

23	7.2	Ensure MS are aware of CBSC and other training courses by NIOHC CL	CB coordinator NIOHC Chair	As Required	On going
24	8.1	Invite IMO to attend the 16 <sup>th</sup> NIOHC	Chair	16 <sup>th</sup> NIOHC	Completed
25	8.2	Invite GEBCO Guiding Committee /Bathymetric Regional Project Chairs to attend NIOHC16 Meeting	Chair	16 <sup>th</sup> NIOHC	Completed
26	8.3	Invite IALA to attend the 16 NIOHC	Chair	16 <sup>th</sup> NIOHC	Completed
27	8.4	Invite PERSGA to attend the 16 <sup>th</sup> NIOHC	Chair	16 <sup>th</sup> NIOHC	Completed
28	10	Encourage Discussion at IRCC7 on Maximizing Hydrographic Data paper Whilst also noting NIOHC reservations in relation to open data politics.	Chair	End March 2015	Completed
29	11	NIOHC to have a standing agenda item of towards Data Centricity/ e-Navigation to recognize its importance to the mariner and future hydrographic products.	Chair	Ongoing	Included in agenda
30	11	IALA/IHB/CIRM to keep NIOHC abreast of e-Navigation Issues relevant to hydrographic officers understanding the likely rapid implementation.	IALA, IHB, CIRM	Ongoing	On going
31	15	NIOHC to have an agenda item on Crowd-Sourced Bathymetry at the 16 <sup>th</sup> NIOHC following the paper and discussions at IRCC7.	Chair	16 <sup>th</sup> NIOHC	Included in agenda
32	16	NIOHC to have an agenda item on Satellite Derived Bathymetry.	Chair	16 <sup>th</sup> NIOHC	Included in agenda
33	18	Produce the report to IRCC on the work of the NIOHC and represent NIOHC at IRCC7.	Chair	16 <sup>th</sup> NIOHC	Completed

#### 4. Review of the Statutes of the Commission

##### 4.1 Designating the NIOHC representatives to the IHO Council

Mr. Mustafa Iptes gave a presentation on the IHO Council and the proposed procedure for selecting the members of the same.

During his presentation, discussion was held regarding the qualifying criteria for selection of Member States to the IHO Council. As per the procedure presented by the Mr Iptes, all Member States of an RHC were eligible for candidature. India brought out that RHC boundaries extended from the land boundaries of two States. This division however did not necessarily follow charting responsibilities. Appropriately, MS with land boundaries in adjoining RHCs, but with charting areas overlapping with Area 'J', became full members in such cases. The requirement of representation in Council is a new development and was non-existent at that time. During the discussion India proposed that in order to ensure fair representation of the interests of the regional states, MS located within the region (land and sea area) should only be considered for selection to IHO Council. However, this is not to alter the



existing statutes as far as granting membership is concerned but to only put a qualifying criteria for candidature to the Council within the RHC to those MS, which have both land and sea boundaries with the RHCs. This will also support the IHO decision to use RHCs as the basic constituency for selection of Council Members. After an exhaustive discussion on the subject, it was decided to put the matter to vote. Bangladesh, Egypt, Myanmar, India and Saudi Arabia voted in favour of the proposal, while UK, Sri Lanka and Pakistan voted against. Thailand remained abstain to vote. Thus the proposal was not accepted by the Commission.

MS revised and accepted the 'Procedure for the Designation of NIOHC Representatives to the IHO Council' as Annex A to Statutes of the NIOHC along with the flowchart (Appendix 1) and example of voting paper (Appendix 2).

## 5. IHO/IHB Matters

### 5.1 IHB Report

R Adm (Retd) Mustafa Iptes (Director, IHB) delivered a lecture on the report of the IHB to the Conference. He mentioned that for the ratification of Protocol of Amendments on IHO Convention, 46 of 48 approvals are officially received from MS. Egypt, Myanmar and Thailand have yet to approve the Protocol of Amendments on IHO Convention. The next IHC will be Assembly-1 if 2 more approvals are received before 23 January 2017.

He also intimated that the new IHO Member States are Georgia (83<sup>rd</sup>), Vietnam (84<sup>th</sup>) and Brunei Darussalam (85<sup>th</sup>). Suspended MS are Congo, Dominican Republic and Serbia. Four States are waiting for accession, which are Bulgaria, Haiti, Mauritania and Sierra Leone. Four applications are in the course of approval for IHO membership, which are Malta, Vanuatu, Solomon Islands and Republic of the Congo. For such approval 7 MS are yet to response: Bangladesh, Egypt, Myanmar, India, Pakistan, Saudi Arabia and Thailand. The director urged MS to accelerate the process for approval.

The IHB Directing Committee, in cooperation with the Department of External Relations of the Government of Monaco, stands ready to assist, through diplomatic or other channels, for membership of the IHO non-member States in the NIOHC region. The Director requested that Jordan, Maldives and Sudan can be encouraged to become NIOHC associate member and IHO member.

No	Agenda Item	16 <sup>th</sup> NIOHC Conference Action	Action By	Date
1	5.1	Encourage Jordan, Maldives and Sudan for NIOHC associate membership and IHO membership.	Chair and IHB	On going
2	5.1	Accelerate the process of approval on the ratification of the protocol of amendments to the IHO Convention and report IHB on any difficulties being encountered or assistance required.	Egypt, Myanmar and Thailand	As soon as possible
3	5.1	Expedite wherever possible the approval process for the applications of Malta, Vanuatu, Solomon Island and Republic of Congo to join IHO.	All members (Except UK and Sri Lanka)	As soon as possible

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The Director elaborately discussed the GIS developments under IHO which included; Country Information Database, Regional Information Database, Pilot project underway (Antarctica GIS) and the ENC catalogue. He informed that the IHB has initiated an 'INToGIS' project that will move S-11 part B into an interactive GIS / S-100 compliant environment. The objective of the project is to provide the Regional International Charting Coordination WGs with relevant on-line updated information and the necessary tools to review and maintain INT chart schemes and monitor the implementation of the INT chart schemes. India, being the INT coordinator of region J, continued to provide regular updates to S-11 Region J. MS of NIOHC were encouraged to continue to provide updates to S-11 through India. Of the total INT charts in the scheme, 76.6% is published.

No	Agenda Item	16 <sup>th</sup> NIOHC Conference Action	Action By	Date
4	5.1	Continue to provide updates to S-11 through India as Chair of the NICCWG for region J.	All Members	As required

He then reminded the theme for World Hydrographic Day-2016\_ "**Hydrography – the key to well-managed seas and waterways**". This theme will enable all stakeholders involved in hydrography to highlight the significance and importance of their particular activities which could include, but is not limited to, the support of safety of navigation, protection of the marine environment, coastal zone management, marine spatial data infrastructures, defence, resource exploration, and all other components of the blue economy. Member States are invited to forward as soon as possible to the IHB any material that is created in support of national WHD-2016 celebrations for posting on the IHO website. The IHB will be providing some supporting material on the IHO website. Member States are requested to conduct awareness building on hydrography in support of WHD by reaching mass population.

No	Agenda Item	16 <sup>th</sup> NIOHC Conference Action	Action By	Date
5	5.1	Conduct awareness building on hydrography in support of WHD by reaching mass people	All Members	On going

The Director mentioned that the International Hydrographic Review (IHR) provides an opportunity for Member States to publicize technical and other achievements in the region. An editorial board comprising a representative from each region has been established. Papers for consideration for publication in the IHR should be forwarded directly to the IHB ([ihreview@iho.int](mailto:ihreview@iho.int)) with a copy to the Editor ([ian.halls1@defence.au.gov](mailto:ian.halls1@defence.au.gov)).

No	Agenda Item	16 <sup>th</sup> NIOHC Conference Action	Action By	Date
6	5.1	Consider submitting papers for publication in the International Hydrographic Review	All Members	As required

## 5.2 NIOHC Report to IRCC7 (Inter Regional Coordination Committee)

The Secretary overviewed the points of NIOHC Report to last IRCC7 meeting. The same report also had been circulated to MS.



### 5.3 IRCC7 Report (Inter Regional Coordination Committee)

Mr. Mustafa Iptes provided a presentation on the last IRCC7 meeting held in Mexico in 2015, where 15 RHCs, IRCC subordinate bodies, 3 observing organizations and 29 observers participated.

The IRCC reviewed the reports and activities of the RHCs and its subordinate bodies, considered the outcomes of the EIHC-5, acknowledged the accomplishments and challenges of the Capacity Building programme and IBSC activities, examined the developments on Crowd-Sourced Bathymetry and maximizing the use of Hydrographic Data and considered the WEND related issues.

The Committee examined the management and monitoring of INT chart production and agreed on an experimental procedure for monitoring and validating new INT Chart production. This procedure will be coordinated and implemented by Regional INT Chart Coordinators or INT Chart Coordination Working Groups (ICCWGs) and will run for two years before further evaluation.

The IRCC acknowledged the accomplishments and challenges, including the resource limitations of the IHO secretariat, to support the administration of the Capacity Building programme and IBSC activities. The Committee approved the CB work programme, the IBSC work plan and the new IHO Publication S-5B - *Standards of Competence for Hydrographic Surveyors*.

The Committee also endorsed the proposal of the World-Wide Navigational Warning Service Sub-Committee (WWNWS-SC) to submit proposed revised texts related to Maritime Safety Information documents directly to the International Maritime Organization through the IHB in the future.

The IRCC agreed on the need to update IHO publication C-16 - *National Hydrographic Regulations* and also decided that an appropriate supplement or additional chapter, as appropriate, on maximizing access to bathymetric data collected for commercial or scientific purposes was required in IHO Publication C-17 - *Spatial Data Infrastructures: "The Marine Dimension" - Guidance for Hydrographic Offices*.

India highlighted the importance of IRCC meeting as the IRCC deals with all the technical issues of hydrography. As such, it was decided to encourage MS for sending representative to IRCC to keep pace with changes in the cartography (Action item 3). MS agreed to send representative to IRCC conference.

No	Agenda Item	16 <sup>th</sup> NIOHC Conference Action	Action	Date
7	5.3	Member States are encouraged to participate in IRCC meeting and Chair to issue letter to MS in this regard.	Chair and all members	October 2016

The Director IHB highlighted on the SPI and WPI. These performance indicators need to be reviewed, revised and updated and there will be agenda item to the next IRCC meeting in this regard.

### 5.4 WEND-WG Report (Worldwide ENC Database – Working Group)

David Wyatt (Assistant Director, IHB) provided an overview on ENC data flow of the producer-RENC-Distributor.

Discussion took place for the participation in the WEND-WG meeting.

No	Agenda Item	16 <sup>th</sup> NIOHC Conference Action	Action By	Date
8	5.4	Member States are encouraged to participate in WEND-WG meeting and Chair to issue letter to MS in this regard.	Chair and all members	Letter to be issued by 30 October 2016

### 5.5 HSSC7 Report (Hydrographic Services and Standards Committee)

Rear Admiral (Retd) Mustafa Iptes provided a brief summary on the seventh meeting of the Hydrographic Services and Standards Committee (HSSC) which took place at Busan, Republic of Korea, hosted by the Korea Hydrographic and Oceanographic Agency (KHOA) from 10 to 13 November 2015. The details are uploaded at NIOHC webpage. Members are encouraged to participate in HSSC meeting.

No	Agenda Item	16 <sup>th</sup> NIOHC Conference Action	Action By	Date
9	5.5	Member States are encouraged to participate in SSC meeting and Chair to issue letter to MS in this regard.	Chair and all members	Letter to be issued by 31 August 2016

### 5.6 IHO Year Book P-5

The Assistant Director, IHB reminded the conference that P-5 is the source of information such as membership details, contact points for countries hydrographic responsibility, survey and training capacity. As such, MS were requested to send amendments to the IHB as and when required for the P-5. He also informed that P-5 along with C-55 is migrated to a GIS platform to make the data more accessible.

### 5.7 Status of Hydrographic Surveying and Nautical Charting Worldwide C-55

Mr. Mustafa Iptes informed that the work has been continued on developing a GIS database application to support C-55 *Status of Hydrographic Surveying and Charting Worldwide* and the work of IHO. In addition to the current composite indicators (percentage of areas adequately surveyed / requiring re-survey / not surveyed), the inclusion of CATZOC polygons will provide an initial geo-referenced quality layer.

No	Agenda Item	16 <sup>th</sup> NIOHC Conference Action	Action By	Date
10	5.6 and 5.7	Review entries in IHO publications C-55 and P-5 (Year book) at least annually and submit amendments to the IHB as appropriate.	All Members	As required

### 5.8 Marine Spatial Data Infrastructure (MSDI)

Mustafa Iptes (IHB) presented the concept of MSDI. MSDI is not the distribution of electronic charts/digital services and e-navigation. It is about distribution and access to marine geospatial data.

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The access to geospatial data is now a UN priority. In this regard, encouraging Crowd-Sourced Bathymetry, developing satellite Derived Bathymetry and supporting the IHO-IOC GEBCO Ocean mapping programme may improve data discovery. HO's can be the managers of the national hydrographic data store.

## 6. National Reports

The salient features of the national reports are appended below:

### Bangladesh

- Surveys were carried out in the coastal areas to update existing national series charts and produce some new INT charts.
- A contract has been signed to build two inshore catamaran hull hydrographic survey vessels in local shipyards.
- Developed a trial ENC cell. BNHD is in the process of capacity building and software acquisition for ENC production.
- Training needs on Cat A hydrography Course, OJT on MBES survey planning, data processing and data management, and training on ENC production.
- Training offered to IHO on Cat B hydrography course.
- BN and UKHO have renewed a MoU regarding the production and distribution of Nautical Charts.

### Egypt

- Extensive surveys have been conducted along the coastline of Egypt on the Mediterranean and red sea down to latitude 22 degree north.
- Recently upgraded most of the software packages used for data collection and processing including ENC and paper chart production.
- Total 25 ENC cells were produced.
- Three new INT charts have been included in the NIOHC Scheme since last conference.
- Training needed on Cat A hydrographic programme, MSI, advanced ENC Production, Multibeam Sonar and technical aspects of maritime boundaries.

### India

- An average of 45 navigation and defence surveys are conducted annually.
- Four navigation surveys were undertaken in the countries of the IOR.
- One ROV and two AUVs have been commissioned onboard INS MAKAR.
- 300 ENC Cells have been produced (including 29 ENCs of other countries).
- Out of 80 INT Charts, 69 charts are already produced.
- Seven new NAVTEX stations have been established and trials are in progress.
- Capacity building initiatives include joint hydrographic surveys, training at NIH and specialized courses for Multibeam training and ENC production.
- Under the foreign cooperation, INHD carried out hydrographic surveys in Maldives, Mauritius, Myanmar, Kenya, Tanzania and Seychelles over the last few years.

## Myanmar

- National Hydrographer visited to UKHO in 2015. Discussion held about the cooperative production of limited ENC cell in Myanmar region.
- Re-survey at Yangon River for producing new edition paper charts and ENC.
- Two surveys at western coast were undertaken for harbour approach charts.
- Joint survey carried out for developing Sittwe harbour with India through mutual cooperation.
- Various hydrographic equipments and sensors were purchased.
- MNHC needs cartographic training, participation in IHO working groups and on-job training.

## Pakistan

- Total 41 nautical charts are published covering entire coast and offshore water of Pakistan. Among these 8 charts form part of INT region 'I' and 3 are part of INT region 'J'.
- PNHD can provide assistance to regional countries in the areas of hydrographic surveys, geodetic and bathymetric data processing/production of charts, Cat B hydrographic course, basic survey recorder course, handling of MSIs and setting up of hydrographic school.

## Saudi Arabia

- Hydrographic Survey Vessel ALMASHE ALBAHRI SULTAN was inducted in June 2015.
- Hydrographic Survey Project 4, 5 and 7 were undertaken in the area of Red Sea and Arabian Gulf.
- The production of 23 ENCs were completed and 09 in progress. QC/QA, encryption and distribution arrangements for charts are under active consideration at the General Commission for Survey (GCS).

## Sri Lanka

- Satellite Derived Bathymetry is being developed with the suitable algorithm and techniques to extract near shore bathymetry by using world view II satellite imageries.
- Two ENC cells are produced for Approaches to Hambantota and Hambantota Harbour.
- Assistance required for the development of Multibeam survey and ENC production capability.
- Courses needed for Cat A on bathymetry and ocean mapping, two week in-country training on MBES, MSI, Cat B in hydrography, digital cartography and workshop on chart adequacy.

## Thailand

- Six surveys were conducted in 2015.
- 37 ENC Cells are on services.

## UK

- Total 127 ENC cells are currently available in NIOHC region.
- UKHO has supported the development of hydrographic and cartographic capability by supporting various CB initiatives.
- Re-establishment of the UKHO funded Bursary Course
  - 2016 – Marine Cartography and Data Processing Course in Singapore.
  - 2017 – 15 week Marine Cartography and Data Assessment Course in Taunton.
- UKHO is always looking at improving coverage for the maritime community using AIS data to

analyse traffic patterns, SDB to augment existing bathymetry and traditional surveys and digital products to support IMO mandate.

### Australia

- A series of surveys were conducted in the South West Pacific (Fiji and Papua New Guinea) as well as ongoing survey work off the northern Australian coast. The Survey Motor Launches (SML) and the Laser Airborne Depth Sounder (LADS) have conducted a range of Hydro scheme tasking in the Great Barrier Reef, Torres Strait, north-west and north-east Australian coast. LADS also conducted surveys in the Coral Sea and around Lord Howe Island.
- Switched the focus from Paper Charts to ENC with highest priority.
- ENC portfolio consists of 847 cells.
- Data is currently being compiled for updating of C-55.

### France

- CARIS HPD is fully operational in the ENC production process.
- Total number of ENCs reached to 468.
- All French ENCs (S-63 encrypted format) are distributed to End User Service Providers by PRIMAR RENC. France provides its support to the work plan of the WEND working group for improving the implementation of WEND principles.
- All INT charts under responsibility of SHOM in the region have all been produced.

### Mauritius

Due to the absence of Mauritius representative, India presented the Mauritius national report.

- Under India-Mauritius cooperation, INHO provides compiling, printing, marketing the charts.
- Total seven charts are produced by India as chart producer nation.
- Updates for C-55 are being undertaken by India.
- Training needed on hydrographic surveying category 'A' and category 'B' courses, nautical cartography (paper chart and ENC), hydrographic equipment maintenance and on job training for hydrographic surveys and chart production.

India agreed to assist Mauritius for updating C-55.

No	Agenda Item	16 <sup>th</sup> NIOHC Conference Action	Action By	Date
11	6	India to assist Mauritius for updating C-55.	India and Mauritius	30 June 2016

### Oman

- The process of production Oman ENC's is an ongoing process. ONHO sent a number of cells to IC-ENC for further QC checks. A number of cells will be ready soon for sending to IC-ENC for final QC process
- Recently, Oman signed the letter of intention to distribute Omani ENCs through IC-ENC.
- The Omani INT Charts scheme which cover both region "I" and "J" has been revised, according to national needs, coastal development, and other requirements.

## Seychelles

- MoU signed with India for hydrographic cooperation in March 2015.
- Seychelles agreed to accord the chart producer nation to India.
- MoU includes surveys and navigational charts, exchange of hydrographic data, joint exchange, training for Seychellois at NIH in India and provision of expertise, capacity building to set up infrastructure.
- No recognized MSI organization
- Courses are needed under capacity building programme.

It was agreed that IHB would visit Seychelles to encourage for the membership of IHO and NIOHC Chair would encourage Seychelles to become a full member of NIOHC.

No	Agenda Item	16 <sup>th</sup> NIOHC Conference Action	Action By	Date
12	6	IHB to visit Seychelles to encourage for the membership of IHO	IHB	31 December 2016
13	6	Encourage Seychelles to become a full Member of NIOHC	Chair	On going

## USA

- NGA produces 246 paper charts for NIOHC region.
- The U.S. is not responsible for any INT series charts in the NIOHC region.
- The U.S. is an active participant in the IHO Capacity Building Sub-Committee, and the U.S./NGA directly supports the IHO Maritime Safety Information (MSI) training course. No MSI training course was offered in the NIOHC region in 2015.
- Two Category A hydrography programmes and one Cat B programme are available.

## 7. NIOHC Committees and Working Groups

### 7.1 North Indian Ocean Chart Coordination Working Group (NICCWG)

The Chairman explained the basic rules related to INT charts proposal and approval process as well as those related to ENC production. He also emphasized the need for regular updates on the publication information on INT Charts for inclusion in S11/INToGIS. He also explained the problems related to overlap of ENC coverage in the same User Bands. The Chairman then opened the discussion and invited the delegates to bring up issues/proposals if any.

No	Agenda Item	16 <sup>th</sup> NIOHC Conference Action	Action by	Date
14	7.1	Updates on publication information of INT Charts to be conveyed to NICCWG Coordinator (India)	All INT Chart producers	31 <sup>st</sup> December 2016

## Sri Lanka

Sri Lankan delegate brought out that they were in the process of preparing a proposal for a large scale INT Chart being schemed for Hambantota Port.

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No	Agenda Item	16 <sup>th</sup> NIOHC Conference Action	Action by	Date
15	7.1	Sri Lanka to put up proposal to NICCWG Coordinator (India) for a large scale chart for Hambantota	Sri Lanka	As soon as possible

### Saudi Arabia

Delegates from Saudi Arabia offered no comments. UKHO suggested that if Saudi Arabia has plans to propose INT Charts, the proposal may be put forward.

No	Agenda Item	16 <sup>th</sup> NIOHC Conference Action	Action by	Date
16	7.1	Saudi Arabia to put up proposals for INT Charts for their waters, if any.	Saudi Arabia	Whenever ready

### Pakistan

The issue of INT 751 to be produced by Pakistan was raised in the NICCWG meeting. During the meeting it was decided that Pakistan is to notify the Region 'I' ICCWG coordinator of the need to commence discussion with Region 'J' INT Chart Coordinator to resolve the cross region coverage issue of INT 751. However, this has not happened as no communication has been received from Area 'I' ICCWG coordinator. This was, therefore, a pending action of NIOHC15. It was further clarified by India that allocation of Chart INT 751 to Pakistan was done by Region 'I' without consultation with NICCWG, wherein over 30% of the Chart coverage falls in NIOHC region (Area 'J'). Other aspects of INT production e.g. data sharing agreements with other stakeholder member states have not been addressed. It was, therefore, proposed by India as outstanding point of NIOHC15. Pakistan had no comments.

No	Agenda Item	16 <sup>th</sup> NIOHC Conference Action	Action by	Date
17	7.1	Outstanding action points of NIOHC15. Pakistan to notify the Region I ICCWG Coordinator (IR of Iran) of the need to commence discussion with Region J INT Chart Coordinator to resolve the cross coverage issue of INT 751.	Pakistan	Prior to RSAHC meeting

### Egypt

Delegates from France as Chairman of the Region F (Mediterranean Sea and Black Sea) ICCWG brought out reference to Document – NIOHC16-7.1a and expressed concerns about the impact of Egypt's new INT Charts on the INT Chart Scheme in the Mediterranean Sea. The point was noted by NICCWG and Egypt was advised to resolve the matter with Area 'F' Coordinator. Egypt discussed the matter with Area 'F' Coordinator and resolved the same.

## Bangladesh

Delegates from Bangladesh brought out that a correction was required in the lower latitude limits of the INT Chart 7453. The same was agreed and noted for correction. Bangladesh further expressed concern over a large overlap between INT 7419 of India and INT 7425 of Bangladesh which was required to be reduced. It was explained that the INT scheme in the area was very well established and the overlap was prudent for safety of navigation. On further insistence from Bangladesh, it was decided that India and Bangladesh would resolve paper chart/ENC coverage bilaterally. It was later decided that status-quo be maintained on the limits of INT 7419.

No	Agenda Item	16 <sup>th</sup> NIOHC Conference Action	Action by	Date
18	7.1	Correction to be carried out on the upper latitude of the INT Chart 7453 to read 22°04.55'N	INT Chart Coordinator (India)	As early as possible

It was further discussed that the time allocated for the NICCWG meeting was not adequate. A full day is required for the fruitful discussion. MS agreed to allocate adequate time (1 day) for NICCWG meeting to allow fruitful discussion.

No	Agenda Item	16 <sup>th</sup> NIOHC Conference Action	Action By	Date
19	7.1	Adequate time (01 day) to be allocated for NICCWG meeting to allow fruitful discussion	Chair	On going

### 7.2 North Indian Ocean Hydrographic Commission Capacity Building

Rear Admiral (Retd) Mustafa Iptes (Director IHB) informed that the level of activity of the IHO Capacity Building Programme continued to increase. The expenditure in the IHO 2016 CB Work Programme was 118% larger than the budget for the previous year. The NIOHC benefited from various activities under the IHO CB Work Programme for 2015, including an introduction MBES course in India and MBES Processing training for Bangladesh and Sri Lanka. ENC Quality Assurance course was postponed to 2016 and re-scheduled for 2016 CBWP. He further informed that one student from Mauritius was selected for Category A Hydrography Master Programme held at the University of Southern Mississippi (USM) in 2015-2016 and one student from Egypt and one student from Myanmar were selected for Category B CHART Project (Cartography Course at UKHO) training held at the UKHO in 2015.

He reminded that most Cat A and Cat B training opportunities require proven proficiency in English language. As a result, many applicants are rejected due to a lack of this proficiency. Hydrographic Offices are encouraged to select and prepare suitable candidates for future training opportunities, especially for the Category A course at USM, where a TOEFL/IELTS certificate is required, together with the required GRE score.

No	Agenda Item	16 <sup>th</sup> NIOHC Conference Action	Action By	Date
20	7.2	Invest in the preparation of candidates for capacity building training.	All MSs	As required

### 7.2.1 Update on Capacity Building activities and submissions since the last meeting

Mr. Jeff Bryant, CB coordinator, stated that there was no request for technical visits in 2015.

### 7.2.2 Report on IHO CB Courses since the last NIOHC Meeting

Mr. Jeff Bryant, CB coordinator, stated that Bangladesh and Sri Lanka were benefitted from a one week MBES Processing training course. A one week 'Introduction to MBES Operations Course' in conjunction with the IIC Academy held in Visakhapatnam, India from 09 to 13 February 2015 where Bangladesh, Egypt, Seychelles, Mauritius, Myanmar and Oman participated.

He further stated that ENC QA training course was funded but not delivered in 2015. To maximise on resources this course will now be run in conjunction with RSAHC at Abu Dhabi sometime in September 2016.

No	Agenda Item	16 <sup>th</sup> NIOHC Conference Action	Action By	Date
21	7.2	ENC QA course to be conducted for MS of NIOHC	CB Coordinator	Invitation by 30 June 2016

### 7.2.3 Update on the 5 year Capacity Building Plan

Mr. Bryant informed that since the last meeting of the NIOHC15 in Oman, he worked out on five year NIOHC CB plan 2013-2017. Four activities were identified for 2016;

- Chart Scheming Workshop (3 days)
- Introduction to MSDI & Data Management (in conjunction with the IIC Academy)
- CARIS Advanced ENC Production Course
- CARIS MBES Processing Course

In time of greater competition for financial resources for CB activity, above-mentioned all four submissions were approved by the CBSC which met in Mexico City, Mexico in May 2015. CARIS Advanced ENC Production Course will be held at Sri Lanka and CARIS MBES Processing Course at Myanmar. Introduction to MSDI & Data Management Course in conjunction with the IIC Academy (NIOHC CL 03/2016) will be held from 20-24 June 2016 at the IIC Academy in Visakhapatnam, India.

The NIOHC CB Plan 2013-2017 will be reviewed annually at NIOHC meetings and any emerging requirements for the other training initiatives can be discussed by NIOHC members for inclusion into the next years plan, noting that submissions made to the CBSC for funding consideration are for the succeeding year.

He put forth the proposed activities for 2017:

- Basic ENC & ENC Production (10 days)
- 2 CARIS technical training courses (5 days)
- Law of the Sea Workshop (5 days)
- Repeat Technical visits, if needed.

No	Agenda Item	16 <sup>th</sup> NIOHC Conference Action	Action By	Date
22	7.2.3	Update the NIOHC 5 year plan to include input from NIOHC16	CB Coordinator	30 April 2016

Post-Conference note – the following NIOHC capacity building projects were submitted to the CBSC Chair for 2017:

- MSI (Training on establishment of MSI structure and basic MSI procedures – 03 days).
- Technical Visit to Government high authorities of Seychelles by IHB.
- 2 Advanced Chart Production Course (Bangladesh and Myanmar - 05 days each).

He stated that in a period of greater competition for CB funding, it cannot be guaranteed that all activities will be endorsed.

He mentioned some advanced training opportunities:

- GEBCO Graduate Training Project at University of New Hampshire (USM), USA (1 year) funded by Japan through the Nippon Foundation.
- CAT B Cartography (15 weeks) at UKHO (IHO CL 04/2016 refers).
- Masters programme in Hydrographic Surveying at the USM, USA (1 year) funded by ROK.
- CAT B Cartography (15 weeks) at KHOA, Busan, ROK

#### **7.2.4 Status of Hydrographic Cooperation in Mauritius (India)**

Rear Admiral Vinay Badhwar (India) presented the status of hydrographic cooperation in Mauritius. He stated that Mauritius is an island nation having 2040 sq km of the southeast coast of African continent and stands at the crossroads of oceanic trade. Hydrographic surveying and nautical charting are required for safe navigation routes and in support of all maritime activities including economic developments, security, scientific research and environmental protection. Realizing the criticality of navigational safety and the obligation under SOLAS Convention, a MoU between Mauritius and India was signed on 24 October 2005. The MoU provides for promotion of development and cooperation in the field of hydrography between the two countries on the basis of equality and mutual benefit. The potential areas of cooperation include assistance in the production of navigational charts, printing of staff and exploiting of setting up hydrographic infrastructure in Mauritius.

After the MoU, nine ship missions of the Indian Hydrographic ships to Mauritius have been completed since 2006. The combined effort of the two countries has resulted successful completion of 27 hydrographic surveys, which have culminated with the production of 7 nautical charts in Mauritius waters. He took the opportunity to thank each one of the organisations for active support which have been instrumental towards enhancing hydrographic cooperation between the two countries.

A website of the hydrographic unit was developed for easy access and interaction with various stakeholders. A contract document for undertaking project surveys was prepared in consultation with State law office and application form for request was also available in the ministry's website. A scheme has been envisioned in order to provide the mariner with up to date information at high seas by promulgating navigational safety information concerning ports and harbours approaches and coastline in the major ocean area.

India also provided data for delineation of maritime boundary, storm surge modelling and other development projects in the maritime domain.

Hydrographic Unit of Mauritius celebrated World Hydrography Day in 2014 and 2015 and the occasion was utilized for creating the awareness and importance of hydrography in maritime safety, security and national development.

## 8. Relevant International Organizations' Report

### 8.1 General Bathymetric Chart of the Oceans (GEBCO)

Dr Rochelle Wigley (GEBCO) gave a presentation on the role and works of GEBCO, which operates under the joint auspices of the IHO and IOC of UNESCO and provide the most authoritative, publicly available bathymetric datasets for the world's oceans. This data is a continuous terrain model for ocean and land with a spatial resolution of 30 arc seconds.

It maintains and makes freely available a gazetteer of undersea feature names which is available via a webmap application IHO DCDB hosted by NCEI (<http://www.ngdc.noaa.gov/gazetteer>) along with global gridded bathymetric datasets, global set of digital bathymetric contours, GEBCO digital atlas, GEBCO world map, web map service and IHO-IOC GEBCO cook book ([www.gebco.net/data\\_and\\_products/](http://www.gebco.net/data_and_products/)).

She reminded the delegates about the Postgraduate Certificate in Ocean Bathymetry at the University of New Hampshire, USA funded by the Nippon Foundation of Japan.

MS agreed that GEBCO should be invited to attend the next NIOHC Conference (Action item 25).

No	Agenda Item	16 <sup>th</sup> NIOHC Conference Action	Action by	Date
23	8.1	Invite GEBCO Guiding Committee/ Bathymetric Regional Project Chairs to attend 17 <sup>th</sup> NIOHC Conference	Chair	17 <sup>th</sup> NIOHC Conference

## 9. Maritime Safety and the World Wide Navigational Warning Service

### NAVAREA-VIII Coordinator

Cdre A K Jolly, NAVAREA-VIII coordinator (India), presented the report of NAVAREA-VIII. He displayed the area of responsibility to the delegates.

Transmission of INMARSAT takes place twice a day at 1000 & 2000 hours UTC from Les Pune station and it is monitored by Indian National Hydrographic Office. NAVAREA-VIII warnings are transmitted through Les Aussaguel in case of failure of les Pune. Coastal warnings for Reunion and Mayotte are broadcast by Les Aussaguel.

He stated the yearly breakdown of NAVAREA warnings. The number of NAVAREA warnings against the year are 615 (2009), 852 (2010), 728 (2011), 674 (2012), 731 (2013), 691 (2014) and 903 (2015). Online NAVAREA-VIII warnings are also available on [www.hydrobharat.gov.in](http://www.hydrobharat.gov.in). Information from the MSs is a grey area on which all need to work on. Very less number of requests for NAVAREA warnings are received from the national coordinators. The coordinator has also introduced digital form (IH-102), which can be forwarded directly via [www.hydrobharat.gov.in](http://www.hydrobharat.gov.in).

India has introduced new NAVTEX chain around India covering a very large area. The chain consists of 07 stations. The coverage of each station is 150 nm. Very shortly these stations will be operational. He further mentioned that the information about NAVTEX coverage in the region is lacking and he requested MSs to provide relevant information to NAVAREA coordinator.

Rear Admiral Vinay Badhwar informed that there are lot of gaps in information concerning MSI. There is a very limited flow of information. Overall, it is noticed that there are statements in the national reports about NAVTEX warning, communication, etc issues. At the same time he complemented Myanmar for being prompt in taking actions of MSI information transmission. They are very proactive along with France concerning Reunion.

The coordinator provided the table below on contacts for warnings and requested to put forward the contact information, if there are any updates.

<b>Country</b>	<b>E-mail</b>
Bangladesh	cns@dos.gov.bd
Kenya	info@kma.go.ke
Maldives	mrcc@mndf.gov.mv
Mauritius	3bm.mrs@mauritiustelecom.com
Myanmar	Mnhc-office@m-n-h-c.com yehtunoo@m-n-h-c.com hydro.navy.ygn@mptmail.net.mm zawlat@m-n-h-c.com soenyuntthaw@m-n-h-c.com
Seychelles	dg@smsa.sc
Reunion Island	<u>Cellmer.emia@fazsoi.defense.gouv.fr</u>
Sri Lanka	ravi@slpa.lk dmsmos@sltnet.lk

### **NAVAREA-IX Coordinator**

Cdr Fayyaz (Pakistan), stated that Pakistan being NAVAREA-IX Coordinator is responsible for transmission of MSIs. Under GMDSS, two types of MSI are issued. NAVAREA-IX warnings are transmitted through International Safety Net and Coastal warnings through NAVTEX.

NAVAREA IX warnings are broadcast daily at 0800 UTC through INMARSAT using LES Perth. Whereas, unscheduled broadcast for urgent navigational warnings are made as and when required. Numerical list of all enforced NAVAREA IX warnings is broadcast each Saturday. Reprint of all NAVAREA IX warnings, issued during a week, is also included in the weekly edition of Pakistan Notices to Mariners.

Coastal warnings are broadcast on NAVTEX on 518 kHz from GMDSS Coast Radio Station, Karachi. These warnings are broadcasted six times a day i.e. after every four hours commencing UTC 0230, 0630, 1030, 1430, 1830 and 2230. Weather messages are transmitted at 0630 and 1830 UTC daily. NAVTEX setup is being upgraded and warnings are issued using alternate available options.

In order to ensure integrity of MSIs being received by mariners, Coordinator NAVAREA IX monitors

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its broadcast through INMARSAT C terminal. Similarly, NAVTEX broadcast is also monitored.

Director, IHB mentioned that World-Wide Navigational Warning Service Sub-Committee (WWNWS-SC) is working relentlessly for the safety at sea. He highlighted that this committee provides an internationally coordinated network of broadcast containing information which is necessary for safe navigation at sea. It monitors and guides IHO/IMO on World Wide Navigational Warning Service, which includes NAVAREA, Sub-Area and coastal warnings. He informed that next WWNWS-SC meeting will be held in September 2016 at Alesund, Norway.

Discussion took place on the capacity building of concerned organizations dealing with the MSI of the country.

No	Agenda Item	16 <sup>th</sup> NIOHC Conference Action	Action By	Date
24	9	Member States should consider on the capacity building of concerned organizations dealing with the MSI of the country.	All Members	On going
25	9	MSI Course to be included in CB plan of 2017	CB Coordinator	April 2016

## 10. Towards Data Centricity / e-Navigation to recognise its importance to the mariner and future hydrographic products

Cdre Mahmudul Hassan (Bangladesh), Secretary NIOHC, pointed out that the e-navigation has developed very fast and as such it has been kept as a standing agenda so that the experiences and knowledge of different countries can be shared and how the development has taken place.

The secretary mentioned that last year, Jamie McMichael-Phillips (UK) presented a paper on Towards Data Centricity, Jean-Charles Leclair (IALA) and Michael Bergmann (Jeppesen) presented on e-Navigation and its development. But this time, it could not be discussed too much. He opined to keep this agenda for next meeting.

Rear Admiral Vinay Badhwar (India) opined that a presentation by Industrial Participants could be appropriate to keep the forum in touch on this subject and its likely future development.

Rear Admiral Tim Lowe (UK) mentioned that IALA and IMO can work in this area. UKHO will study on the topic and take a lead for presentation in future.

Rear Admiral (Retd) Mustafa Iptes mentioned that e-Navigation is one of the IMO's work programme as a new concept. There is a utilization of e-Navigation study works under the IMO. IHO also contributes and supports e-Navigation. IALA is also heavily involved on e-Navigation studies. He informed that IHO supports the S-100 standard which is designated as a tool for e-Navigation. He suggested keeping this as an agenda for next meeting.

David Wyatt discussed on the data centricity and e-Navigation. He pointed out that data centricity and e-Navigation are not the same thing. E-navigation is required for maritime information. There is a lack of coordination among the maritime services, that's why there is a need of regional solution.

The Chair told to keep this as an agenda for the next conference and UKHO will be the lead agency to project the topic.

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No	Agenda Item	16 <sup>th</sup> NIOHC Conference Action	Action by	Date
26	10	NIOHC to have a standing agenda item of Towards Data Centricity/e-Navigation to recognize its importance to the mariners and future hydrographic products	Chair	On going
27	10	UKHO will give a presentation on Data Centricity/e-Navigation in the next NIOHC17 Conference.	UKHO	17 <sup>th</sup> NIOHC Conference

## 11. Experience in Dealing with Maritime Disasters in relation with IHO Guidelines

Chairman asked the participants whether they have experiences in dealing with maritime disaster which will help others in dealing the same in future.

Cdre Brett Brace (Australia) informed that Australia got recent experience on Fiji cyclone. He urged whether there can have resolution to put some responsibilities to the RHCs in regard to the disaster management.

Rear Admiral Vinay Badhwar (India) mentioned that Indian Navy is working out modality for responding to natural disasters and this is based on the experiences gained in Indonesia and Sri Lanka and then a very peculiar situation in Maldives for water.

The Chair asked Sri Lanka whether during tsunami of Sumatra in December 2004, there was a paradigm shift at Sri Lanka ports for the navigational safety. A.N.D. Perera (Sri Lanka) informed that as the continental shelf is very narrow along the coast of Sri Lanka, there was not much change in the sea bottom topography. Rear Admiral Badhwar added that IN ships went for assistance during that occasion and found no major changes in depth. Cdre A K Jolly (India) brought out his involvement in tsunami operation at Sumatra along with hydrographic ship NIRUPAK. He mentioned that the effect of tsunami at Vishakhapatnam didn't have any paradigm shift in the topology of the seabed at or near to the harbour; rather the positional change/missing of the buoys and wrecks made the area dangerous for the navigation.

The Chair mentioned that this type of disaster like earthquake and tsunami may take place anytime in any part of North Indian Ocean and this will cause problem to that coastal State. He also mentioned that though Sumatra is far away from the east coast of India, even though the effect of that had travelled to the east coast of India. The lesson learnt is that whenever there is such natural calamity, there is likely to be underwater changes and sinking of the ships will take place. This may happen at any part of this region and will definitely cause navigational hazard to the coastal States. In this regard, hydrographic organisations of different countries' assistance will be required definitely. Hydrographic ships would render assistance by marking the safe route to the harbours.

Rear Admiral (Retd) Mustafa Iptes, Director IHB, mentioned that there is resolution on IHO response to disaster which was accorded after the 2004 tsunami and revised following the Japan tsunami in 2012. Now IHB has final resolution 'IHO disaster reaction organisation' which is available for any kind of disaster response. He further discussed on the last big cyclone at Philippines and recent one at Fiji, South-West Pacific Region. Though IHB couldn't contact with Philippines, but Fiji cyclone disaster management was a good example of cooperation. He appreciated Cdre Brett Brace (Australia) for his

heavily involvement in coordinating all supportive activities together with New Zealand Hydrographic Office, UKHO, France and USA. He mentioned that IHB has a mechanism and system to coordinate with IMO, IALA, IOC, WMO and UNESCO as intergovernmental organisations for any emergency situation. He highlighted that IHO resolution regarding response to disaster is ready to implement if any case to happen.

The Chair proposed that if any disaster happens within the NIOHC region, the NIOHC will take the lead and inform IHO. It will take initiative to coordinate the available assistance of MSs in the region. R Adm Badhwar supported the same and proposed to add it as action point for making a framework within NIOHC.

Director, IHB informed that according to IHO resolution, all responsibilities are to be carried out by RHCs. There are many laws, regulations regarding the coordination, cooperation and keeping IHB involved for further coordination with IMO, IALA, IOC, WMO, UNESCO, etc.

Member States agreed that NIOHC Chair will take leading role as per IHO guideline to coordinate IHB and concerned country when some disasters occur in the region.

No	Agenda Item	16 <sup>th</sup> NIOHC Conference Action	Action By	Date
28	11	NIOHC chair will take leading role as per IHO guideline to coordinate IHB and concern country when some disaster occurs in the region.	Chair	As required

## 12. Crowd-Sourced Bathymetry

Mr. Mustafa Iptes provided a verbal summery on Crowd-Sourced Bathymetry. He mentioned that IRCC established the Crowd-Sourced Bathymetry Working Group (CSBWG) to provide guidelines on the collection and use of crowd-sourced bathymetry. MS were invited to nominate representatives to participate in the CSBWG (IHO CL 42/2015). The web-based interface portal to the IHO Data Centre for Digital Bathymetry, hosted by the USA in Boulder, Colorado, as part of its commitment to the system of World Data Centres, is being upgraded to be compatible with the crowd-sourced bathymetry concept. This will enable an IHO-led CSB infrastructure to be established and promoted in the IMO and across the wider maritime community.

David Wyatt, Assistant Director of IHB, made an effort for a presentation on Crowd-Sourced Bathymetry. He stated that the data resolution of moon and Mars are much higher than that of the world oceans and this has become a challenge. Unsurveyed and incomplete surveys are very common in various places of the ocean areas. To a greater extent, third party data is being used. Thus it is required to provide appropriate standard and procedures with new technology. Ships of opportunity can get the bathy data. IHO, HOs and third parties need close cooperation to improve the data.

For bathymetric mapping projects, IHO has initiated a collaborative project to enable qualified mariners and professionally manned vessels to collect 'crowd-sourced bathymetry'. Ultimately, enhanced IHO DCDB infrastructure and interface will allow the public to upload, search for, display and download bathymetric data via a web-based interface.

Significant of bathymetric and metadata is collected for scientific purposes not made available for

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other uses other than regional scientific and private uses around the world held by scientific and academic reasons. Mechanisms must be found to make such data undiscoverable and ultimately made available for other purposes as appropriate. Coastal States can take actions on this matter noting SOLAS responsibilities. He illustrated the different countries database where huge amount of data are stored. These can be made available for the users not necessarily for charting; these can be used for risk management, ocean current modeling, etc.

The IHO DCDB can accept data via File Transfer Protocol (FTP), e-mail, CD and DVD as well as other mutually agreed upon digital media. Data are preferably in the MGD77 exchange formats, but any well documented format is acceptable.

Finally he urged to collect bathymetric data wherever and whenever possible and to release data held in archives, at lower resolution if necessary. He reminded that all data are not appropriate for charting but all data are of use to somebody in some way.

Rear Admiral Tim Lowe (United Kingdom) also discussed on the subject.

Member States agreed to have an agenda item on Crowd Sourced Bathymetry in the next conference.

No	Agenda Item	16 <sup>th</sup> NIOHC Conference Action	Action By	Date
29	12	NIOHC to have an agenda item on Crowd Sourced Bathymetry at 17 <sup>th</sup> NIOHC Conference	Chair	17 <sup>th</sup> NIOHC

### 13. Satellite Derived Bathymetry

General discussion took place on SDB. But there was no presentation on the topic. MS agreed to keep SDB as the agenda item for NIOHC17 and UKHO and IIC Technologies will share their experience on the same in the next NIOHC conference.

No	Agenda Item	16 <sup>th</sup> NIOHC Action	Action by	Date
30	13	Include Satellite Derived Bathymetry as agenda item for NIOHC17	Chair	17 <sup>th</sup> NIOHC
31	13	Experience on SDB will be shared by UKHO and IIC Technologies in 17 <sup>th</sup> NIOHC Conference	UKHO and IIC Technologies	17 <sup>th</sup> NIOHC

### 14. Bangladesh's Experiences of Surveying and Charting in a Dynamic River Environment (Bangladesh)

Cdr Firoz Ahmed (Bangladesh) presented a paper on 'Bathymetric Survey in the Coastal Area of Bangladesh – A Challenging Experience for the Surveyors'. He firstly brought out the description of Bangladesh coast which is very dynamic in nature. Secondly he discussed on some unique characteristics and phenomenon of the coast in terms of tide, tidal stream, salinity, temperature, turbidity, monsoon effect, shallow & indented coast, shifting of channel, cyclone effect, presence of

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fishing fleet and inaccessibility to the coastal area that makes the hydrographic surveying task more challenging and different from other parts of the world. He provided a research work on how these characteristics have effect on hydrographic survey operations and on the performance of equipment. His in-depth analysis showed how the local conditions affect the performance of single and multi-beam echo sounder, side scan sonar and current profiler. At the end, he approached to the practical solution to the problems. France, India and UK discussed on the challenges that Bangladesh faces and proposed for the possible solutions. This paper is uploaded in NIOHC webpage. MS agreed to send the paper for inclusion in IH Review.

No	Agenda Item	16 <sup>th</sup> NIOHC Conference Action	Action By	Date
32	14	Bangladesh to send the paper presented during 16 <sup>th</sup> NIOHC on their experience of surveying and charting in a dynamic river environment for inclusion in International Hydrographic Review.	Bangladesh	31 July 2016

### 15. IHO Certified Cat 'A' and Cat 'B' course and suitable course for Survey Technician for Mauritius under IHO/NIOHC Capacity Building Plan (Mauritius)

On behalf of the Mauritius, R Adm Badhwar (India) talked on this issue. Basically, Mauritius wants to get fund under IHO/NIOHC capacity building plan, in particular for international travelling, accommodation, food cost of the Mauritius participants of Category A and Technician Courses in India. In this regard, Mr Jeff Bryant, NIOHC CB Coordinator, mentioned that it will be difficult to incur these costs from the CB Fund. R Adm Badhwar requested to put forth this issue in the next CBSC meeting.

No	Agenda Item	16 <sup>th</sup> NIOHC Conference Action	Action By	Date
33	15	CB Coordinator will develop a submission to seek funding for Cat A and Technician course for Mauritius.	CB Coordinator	April 2016

### 16. The outcome of the modernisation of the local Omani geoid (Oman National Survey Authority and IIC Technologies to update)

Mr. Sanjeev Sharma (IIC Technologies) provided a presentation on 'Establishment of Oman National Geoid Model'. The project had the work components in the field of levelling, ground gravity survey, airborne gravity survey, geoid computation and training.

For levelling purpose, total 300 benchmark monuments along the proposed levelling lines was constructed having at about 5 km spacing. The levelling was carried out along three levelling lines of a total distance of nearly 1200 km. This linked to publicly available tide gauges.

GPS-positioned ground gravity measurements were acquired at 2 km spacing over the cities and populated areas. There were 6000+ gravity data points. Airborne Gravity Survey was carried out at 5 and 10 km line spacing. A total 76000 line-km was surveyed keeping 300 m. flight height.

The final computed goid model is expected for delivery by the end of April 2016.

## **17. Industrial Participants' Presentation**

### **17.1 Presentation by CARIS.**

Mr. Alejandro Gerones, representative of CARIS, gave a presentation on 'The New Standard S-100 and CARIS: Hands-on Approach'. In the presentation, he mentioned about the purpose and benefit of S-100. S-100 data products need to be created and tested. Finally he brought out that various CARIS tools will be able to meet the requirement for creation of sample products based on S-100.

### **17.2 Presentation by IIC Technologies**

Cdr (Retd) Sanjeev Sharma, IIC Technologies Ltd, presented on 'Hydrographic Data Management (HDM) – General Commission for Survey of KSA'. The project requirement was to build the infrastructure and develop necessary HDM capabilities to meet the governmental requirements of a National Hydrographic Service and to administer a wide variety of oceanographic and marine sciences data. For meeting the requirements, he identified following objectives:

- Evaluate hardware and software solutions for the operation of hydrographic, oceanographic and marine sciences services.
- Develop the work processes and eh necessary Standard Operational Procedures.
- Train GCS staff
- Establish a quality management system (QMS).
- Develop the capability in GCS to support a MSDI
- Deploy all developed sub-systems.

In his presentation, he discussed on the project team composition, system architecture overview, hydrographic production system, bathymetry system, oceanography system, HDM data flow and finally he updated the status.

### **17.3 IC-ENC Training and Capacity Building (IC-ENC)**

Captain Thani AL MAHROUKI (Oman) provided IC-ENC update since NIOHC15 on behalf of IC-ENC. He focused on IC-ENC membership, folio, services and governance & finances. Presently the organisation has 39 member nations and 04 offices. IC-ENC members have a total number of 5915 cells. Its core services are ENC production support, ENC validation, ENC distribution and Revenue management. In 2015, three ENC validation training courses were conducted and similar courses will be also conducted in 2016.

### **17.4 Presentation by PRIMAR**

Mr. Hans Christofer Lauritzen, director PRIMAR, provided a presentation on PRIMAR's activities and CB programme. It cooperates hydrographic offices with operational and technical support and services in their work to produce, quality control and deliver harmonized ENCs compliant with all relevant international standards. It provides a consistent and reliable ENC service world-wide. It provides all actors with responsibilities for safety of navigation and protection of the maritime



environment with accurate up-to-date maritime geospatial data.

He focused on ENC validation and database. Under the CB 2015, PRIMAR conducted 03 training courses for member nations. Training was provided in ENC production support and PRIMAR tools for ENC delivery, validation and quality control. He also illustrated the PRIMAR RENC value chain in details.

## 17.5 Presentation by SevenCs GmbH

Mr. Lim Cliff of SevenCs brought out the issues that customer face with e-navigation; transition to paperless navigation with ENC and impact of regulations. He found the transition to digital navigation requires significant expertise on transition plan, gap analysis, training programme, ECDIS installation & maintenance plan, bridge procedures, adaptation of purchasing process, ISM procedures and implementation. Crew training (on-going cost), type specific training, older vessels and affordability is also important aspects for the implementation of digital navigation.

## 18. Any other Business

### 18.1 Status Report on UNESCO/IOC Indian Ocean Tsunami and Mitigation System

Cdre Brett Brace (Australia) provided a status report on UNESCO/IOC Indian Ocean Tsunami and Mitigation System. The report is uploaded at NIOHC webpage.

### 18.2 Invitation to 16<sup>th</sup> NIOHC Conference

The secretary brought out that as per the action plan of NIOHC15, some international organizations (IMO, IALA and PERSGA) were invited to participate at 16<sup>th</sup> NIOHC Conference. Their active involvement in the conference is very important for different issues. As such, MS agreed to invite them for participating in 17<sup>th</sup> NIOHC Conference.

No	Agenda Item	16 <sup>th</sup> NIOHC Conference Action	Action by	Date
34	18.2	Invite IMO to attend the 17th NIOHC Conference	Chair	17th NIOHC
35	18.2	Invite IALA to attend the 17th NIOHC Conference	Chair	17th NIOHC
36	18.2	Invite PERSGA to attend the 17th NIOHC Conference	Chair	17th NIOHC

## 19. NIOHC Report to IRCC8

Delegates were invited to discuss what the NIOHC report to IRCC8 should contain and if any issues need to carry forward to IRCC or its subordinate bodies. The following things are to be included in the NIOHC report:

- a. Capacity building activities.
- b. IRCC actions (relevant to NIOHC)

The Chair will produce a report on the work of the NIOHC on behalf of MS and represent the RHC at IRCC8.

No	Agenda Item	16 <sup>th</sup> NIOHC Conference Action	Action by	Date
37	19	Produce the report to IRCC on the work of the NIOHC and represent NIOHC at IRCC8.	Chair	June 2016

## 20. Election of Chair and Vice Chair

The Chair asked Egypt as the current Vice Chair if they wished to succeed to be the next Chair as per NIOHC Statutes article 1e. Egypt agreed to accept Chairmanship of the NIOHC for 2016-2017. All MS congratulated Egypt and offered to assist in the new role.

Egypt proposed India for the Vice Chair nomination. India agreed to accept the Vice Chair. All MS supported this nomination. Therefore, India will be the Vice Chair for the year 2016-2017.

## 21. Date and Venue of the next conference

Egypt offered to host the 17<sup>th</sup> NIOHC Conference. It confirmed the place will be at Alexandria, Egypt and the conference will be held in the month of March 2017. The dates (04 days) will be confirmed later on. The offer to host the conference was warmly welcomed by the participants. Egypt will confirm the dates within 2 months.

No	Agenda Item	16 <sup>th</sup> NIOHC Conference Action	Action by	Date
38	21	Egypt to confirm dates of 17 <sup>th</sup> NIOHC Conference	Egypt	15 May 2016
39	21	Considering the importance of NICCWG meeting, NIOHC Conference to be organized for 04 days.	Chair	On going

## 22. Approval of the Action List

Throughout the discussions in the conference, some action points were taken for further action by the Chair, MS and IHB. All delegates reviewed these action points to ensure that they were satisfied with the wording, timescales, appropriateness, etc. Finally, the 16<sup>th</sup> NIOHC Conference Action List was approved by the MS.

## 23. Closing Remarks from the Chair and handing over of NIOHC flag to the new Chair.

The Chair mentioned that the three days had been indeed highly interactive and educative for all. The enthusiastic participation by all the distinguished delegates was very encouraging. The conference was very successful and could achieve desired objectives.

He further mentioned that the conference started with many expectations and he was sanguine that the conference could fulfill those expectations. By now, it is quite evident that NIOHC is an effective platform for cooperation and coordination of hydrographic activities, capacity building, Maritime

safety, E-Navigation, production of nautical chart, technical assistance and training support. He sincerely thanked all the distinguished delegates for their excellent support and active participation in various discussions.

The Chair further stated that it was a unique privilege for Bangladesh Navy to host the 16<sup>th</sup> NIOHC conference at Chittagong. Bangladesh Navy was honored and delighted for delegates' gracious presence and again thanked them for selecting Bangladesh as the venue of 16<sup>th</sup> NIOHC conference.

On the sideline of the conference, some humble efforts were made by the host Member State to display some of Bangladesh's cultural traditions and heritage. The efforts were highly appreciated by the participants and the cultural glimpses and hospitality captivated participants' hearts and minds to a great extent.

The Chair extended his gratitude to the management of the Hotel Radisson Blu, Chittagong for sparing the venue for the conference and deeply acknowledged and thanked Commander Chittagong Naval Area for the efforts taken to make the conference a success.

The Chair handed over the NIOHC Flag to the new Chair (2016-2017) Egypt.

Finally he wished all delegates a bon voyage, fair weather and the following sea and hoped to see them at future conferences.

**PROCEDURE FOR THE SELECTION OF NIOHC REPRESENTATIVES  
TO THE IHO COUNCIL**

Designation of NIOHC representatives to the IHO Council shall be determined in compliance with IHO General Regulations Articles 2 and 16.

**Role and Authority of Representatives to the NIOHC in the Council**

1. IHO Member States representing the NIOHC shall occupy their seats on the Council for all sessions of the Council throughout the inter-sessional period between Assemblies.
2. All expenses connected with the participation of representatives to the Council shall be defrayed by their respective State, in accordance with IHO General Regulation article 3.
3. In carrying out their role as a representative of the NIOHC to the Council, representatives should take note of any relevant collective decisions, policies or directives established by the NIOHC and ensure that these are considered appropriately by the Council.

**Selection Procedure (see also flowchart Appendix 1)**

4. Three months before an ordinary session of the Assembly, the Secretary-General of the IHO shall inform the Chair of the NIOHC of:
  - a. The number of seats allocated to the NIOHC, and
  - b. Those Member States that are eligible for selection by the NIOHC.
5. If the number of Member States eligible for selection to represent the NIOHC to the Council is equal to the number of seats on the Council assigned to the NIOHC by the Secretary-General under the terms of clause 4 above, then the aforementioned eligible Member States will be designated as representatives of the NIOHC.
6. If the number of Member States eligible for selection to represent the NIOHC to the Council is greater than the number of seats assigned to the NIOHC by the IHO Secretary-General under the terms of clause 4 above, then the Chair of the NIOHC will invite those Member States that have been designated as eligible for selection to the Council to indicate if they wish to be considered as candidates for selection.
  - a. If the number of candidate Member States is equal to the number of number of seats on the Council assigned to the NIOHC, then these

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candidate(s) will be designated as representatives of the NIOHC.

b. If the number of candidate Member States is smaller than the number of seats on the council assigned to the NIOHC, the candidate(s), if any, will be automatically designated and will be complemented by the eligible Member State(s) that have not been representatives of the NIOHC to the Council for the longest time. If this proves inconclusive, the Chair will designate eligible Members State(s) as representative of the NIOHC.

c. If the number of candidate Member States is greater than the number of seats on the council assigned to the NIOHC, the candidate(s) to represent the NIOHC to the Council will be designated through a voting procedure.

## **Voting Procedure**

7. The voting procedure will take place in the three months prior to the Assembly, preferably at a Conference of the NIOHC otherwise by correspondence if no NIOHC Conference is scheduled.

a. Each Member State may submit one voting paper marking as many candidate Member States from the list as seats have been assigned to the NIOHC (see example of voting paper in Appendix 2).

b. The quorum for a valid voting procedure is set at 50% of Member States casting their vote. Representatives of the NIOHC to the Council are then elected by simple majority. An incomplete or blank voting paper is an invalid voting option and that vote will not be counted towards making the numbers necessary for a quorum.

c. When no quorum has been achieved, the voting window is extended for two weeks and the Chair invites the Member States who have not voted or cast an invalid vote to cast their vote. The existing votes stand.

d. If after a second vote no quorum has been achieved, the Chair designates the representatives of the NIOHC to the Council based on the votes cast. In the case of candidates winning equal number of votes then the Member State(s) which has not / have not been a representative of the NIOHC to the Council for the longest time is designated as representative of the NIOHC. If this proves inconclusive the Chair will designate a candidate(s) out of those who have equal votes as representative of the NIOHC.

## **Manning of the Representatives**

8. The Member States selected to represent the NIOHC in the Council are normally represented by the head of the Hydrographic Office. Each Member State shall inform the Chair of the NIOHC and the IHO Secretary-General of the name of

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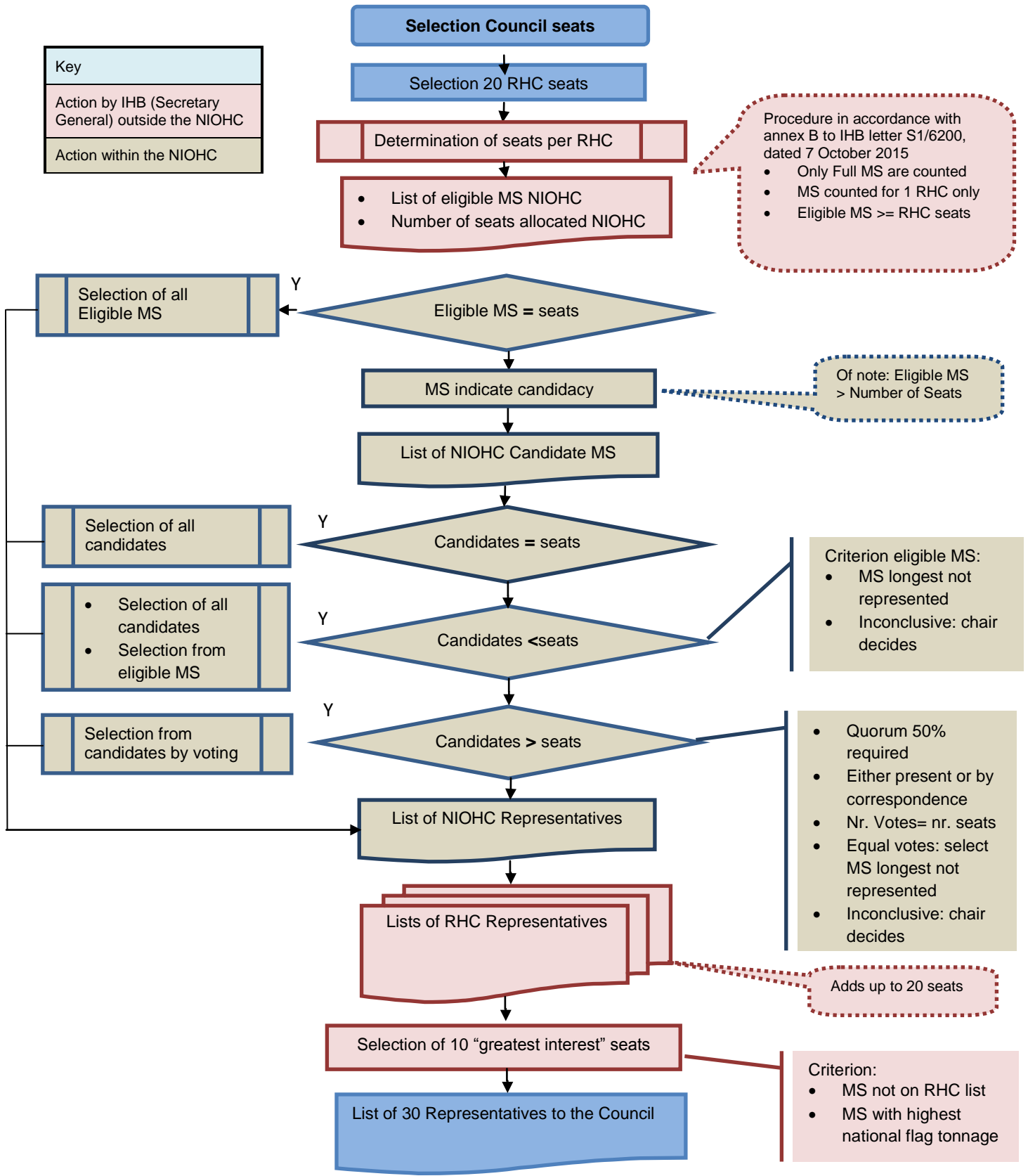
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its official representative. An alternate may also be designated.

9. Member States representing the NIOHC shall inform the Chair of the NIOHC and the Secretary-General of any changes in representation, whether permanent or temporary, as soon as practicable.



**Flow Chart - Selection of NIOHC Representative(s) to the IHO Council**



**North Indian Ocean Hydrographic Commission (NIOHC)  
Selection of Representative(s) to the IHO Council**

**Example of Voting Paper**

**Part A**

Number of Seats on Council allocated to the NIOHC: Chair inserts number in here  
(This is the number of boxes that may be marked below)

**Part B**

To vote for a candidate State put an 'X' in the adjacent Box. The number of boxes that may be marked is shown in Part A above.

Chair inserts candidate State A in here	Votes indicated with an X here
Chair inserts candidate State B in here	Votes indicated with an X here
Chair inserts candidate State B in here	Votes indicated with an X here
Insert other States if appropriate	Votes indicated with an X here

Member State: ..... Date: .....

Authorised by: ..... Position: .....(Signature)

.....  
(Name)