



**2 0 1 1**

## **JANUARY TO JUNE BULLETIN**

In this issue:

<i>Regional Hyd. Commissions</i>	1
<i>Committees/Sub-Committees/</i>	
<i>Commissions</i>	7
<i>Working Groups</i>	14
<i>Other bodies</i>	18
<i>Conferences / Seminars</i>	26
<i>Visits to IHB</i>	29
<i>IHB visits</i>	30
<i>New Hydrographers</i>	32
<i>Information of interest</i>	33
<i>Obituaries</i>	36

### **REGIONAL HYDROGRAPHIC COMMISSIONS**

#### **11<sup>TH</sup> MEETING OF THE NORTH INDIAN OCEAN HYDROGRAPHIC COMMISSION (NIOHC) AND HYDROINDIA 2011 SEMINAR**

New Delhi, India 01-04 March

The 11<sup>th</sup> Meeting of the North Indian Ocean Hydrographic Commission (NIOHC) was held in New Delhi, India, on 1-2 March 2011, under the Chairmanship of RAdm. Nicholas LAMBERT, the UK National Hydrographer. The following 12 States participated in the meeting with 25 representatives: Bangladesh, India, Myanmar, Sri Lanka, Thailand, United Kingdom as Members and France, Oman, Mauritius, Pakistan, Seychelles and USA as Associate Members. VAdm. Alexandros MARATOS represented the Bureau. The following were also present with one representative each: the Intergovernmental Oceanographic Commission (IOC) and the companies Fugro Offshore Survey and Jeppesen. The President of the Directing Committee reported on various important developments within the Organization that had taken place during the intersessional period. The meeting discussed issues concerning the production of ENC's and INT charts, the promulgation of MSI, the MSDI developments and Capacity Building needs. The UKHO will continue chairing the Commission and the next meeting will take place in 2012 in Sri Lanka.

The HYDROINDIA 2011 Seminar and Exhibition were held on 3-4 March. The Minister of Defence, the Minister of Transport and the Chief of the Indian Navy were all present at the Opening Ceremony. The theme of the Seminar was : "Hydrography – An instrument for regional cooperation and maritime safety" and attracted a large attendance, including the Directors of some Member States' Hydrographic Offices.

#### **4<sup>th</sup> MEETING OF THE ROPME SEA AREA HYDROGRAPHIC COMMISSION (RSAHC)**

Muscat, Oman, 21 – 22 March 2011

The 4<sup>th</sup> meeting of the ROPME Sea Area Hydrographic Commission (RSAHC) was held in Muscat, Oman from 21 – 22 March 2011, with a Seminar comprising a series of industry presentations taking place on 23 March. Representatives of Bahrain, Kuwait, Oman, Pakistan, Qatar, Saudi Arabia, the UK and the USA attended the meeting. A national delegation from Abu Dhabi attended as observers. The Islamic Republic of Iran was unable to attend due to delays in obtaining visas. Captain Hugo GORZIGLIA (DIR1) and Mr. Steve SHIPMAN (PAH) represented the IHB.

The Commission approved a revision to the Statutes to reflect the amendments made to IHO Resolution 2/1997, as amended (formerly T1.3). The Commission appointed Mr. Jeff BRYANT (UK) as their Capacity Building Co-ordinator and prepared a prioritised list of CB requirements for submission to the Capacity Building Sub-Committee.

The Commission also decided to establish a RSAHC International Charting Co-ordination Working Group (RSAICCWG) and approved the Terms of Reference and membership. The Commission considered a report from the INT Chart Co-ordinator (IR of Iran) and a draft revision of S-11, Part B, Annex I prepared by the IHB. This draft was adopted pending final confirmation from Oman which is due by 31 July 2011.

The Commission agreed that Oman and Qatar should continue as Chair and Vice-Chair of the Commission. Both Kuwait and Saudi Arabia agreed to investigate the possibility of hosting the RSAHC5 meeting which will probably take place in February 2013.



*Captain GORZIGLIA addressing RSAHC4.*



*RSAHC4 in session.*

#### **5<sup>th</sup> MEETING OF THE SOUTH WEST ATLANTIC HYDROGRAPHIC COMMISSION (SWATHC)**

Arrail do Cabo, Rio de Janeiro, Brazil, 24–25 March 2011

1. The Fifth Meeting of the South West Atlantic Hydrographic Commission was held at the Hotel “A Ressurgencia” in Arrail do Cabo, Rio de Janeiro, Brazil, on 24-25 March 2011.

The Hydrographers of Argentina and Brazil were present, as well as the Hydrographer of Paraguay. Captain GORZIGLIA, IHB Director, represented the IHB. Representatives of the hydrographic industry attended as observers. Regretfully, the Hydrographer of Uruguay could not attend the meeting.

2. Vice Admiral Fernando PALMER, Hydrographer of Brazil and Chairman of the Commission, welcomed the participants and thanked the observers for having accepted the invitation.

3. The Actions agreed at the last meeting were reviewed and discussions took place particularly on the harmonization of the INT Charts and ENC in bordering areas, where agreements between Brazil and Uruguay, and Argentina and Uruguay have not yet been reached.

4. Captain GORZIGLIA, IHB Director, made a presentation concerning the main subjects under consideration by the IHO since the last meeting of the Commission. Emphasis was made on the close relationship with IMO, IOC and IALA, together with several MOUs signed with relevant regional organizations aiming at improving hydrographic visibility and coordination; the progress made with regard to the IHO website, the celebration of the WHD and the availability of IHO Publications in digital form and at no cost. Details were provided on the preparation of the XVIII<sup>th</sup> IHC in April 2012.

Also reported was the work of the HSSC and the IRCC, including details of some of their bodies. Particular mention was made of the standards issued and the regulations updated, particularly C-17, S-99, S-58, S-32, S-4 and M-3. ENC and ECDIS matters, as well as CB issues and the situation with regard to the Protocol of amendments of the IHO Convention and IHO membership were reported.

5. The SWAtHC Planning Committee reported on the relevant issues for the Commission with regard to CBSC, IRCC, HSSC and WEND WG activities. Following these presentations, Argentina, Brazil and Paraguay presented their National reports. Brazil also made a presentation on IENC; the SWAtHC representative on the IHR to the IHR editorial board and the CARIS representative on technical issues. After discussing the overall subjects reported, the Commission identified several actions that need to be worked out, and an Action List was agreed, including a potential technical visit to Paraguay, the Hydrographic Office of which has demonstrated great progress in river chart production (550 kilometres of coverage), thanks, in the words of the Paraguayan representative, to the support received from IHO and particularly from the SWAtHC.

6. In accordance with the statutes of the Commission, Uruguay was elected Chairman and Argentina Vice Chairman of the Commission. The Commission decided to hold the next meeting in Montevideo, Uruguay, in February or during the first half of March 2012.



*Group photo of all participants.*

**10<sup>th</sup> MEETING OF THE SOUTH EAST PACIFIC  
HYDROGRAPHIC COMMISSION (SEPHC)**

Valparaiso, Chile 04 - 06 April 2011

The 10th Meeting of the South East Pacific Hydrographic Commission took place at the Chilean Navy Hydrographic and Oceanographic Service (SHOA), Valparaiso, Chile, from 04 to 06 April 2011, followed by a two-day Workshop on ENC Data Standardization. At the Opening Ceremony, the Director of SHOA, Captain Patricio CARRASCO, welcomed the delegations from Colombia, Ecuador and Peru, as well as Observers. Rear Admiral Leonardo SANTAMARIA, Director General of DIMAR – Colombia - and Chairman of the SEPHC, greeted participants and declared the meeting open. Captain GORZIGLIA, IHB Director, also addressed the participants highlighting the importance of the work of the Commission.

Following the opening of the meeting, Rear Admiral SANTAMARIA provided a complete report on the activities undertaken since the last meeting and handed over the Commission chairmanship to Captain CARRASCO. Captain CARRASCO thanked the Commission Members for their confidence and particularly thanked Colombia for having chaired the Commission for an extra year, as Chile had not been able to assume this responsibility in 2010 due to the earthquake and tsunami in Chile.

The IHB Director provided a detailed report on the main activities of the IHO in general and the IHB in particular since the last SEPHC meeting. Following the report several matters were further detailed, commented and discussed under dedicated agenda items. Special reference was made to the tasks identified by the IRCC2 to be completed by the RHCs.

during the meeting all the delegations presented their national reports, updating the information contained in c-55 and sharing their experience gained in multibeam surveys, special data management and enc production. a visit to the shoa facilities was organized and there was much discussion concerning the different steps of the hydrographic process, nautical cartographic and nautical publication production and hydro-cartographic equipment. special consideration was given to the way hos have faced the two tsunamigenic events and associated emergencies which have occurred in the last 12 months: february 2010 (chile) and march 2011 (japan). the importance of holding the inundation chart production workshop aimed at establishing standardized parameters and methodologies was emphasized. this event is scheduled to take place in chile in 2011.

As a result of the discussions held, the commission agreed to:

- a) Include in the CBWP for 2013 a Regional Workshop on the use of HDP to take place in Lima, Peru;
- b) Task the Commission's coordinators on HSSC, WEND, CBSC and IRCC to develop a regional work programme for approval by the Commission;
- c) Introduce video-conferences to improve coordination and follow-up of actions agreed;
- d) Nominate Commander Enrique Silva (Chile) to represent the SEPHC at the IRCC3;
- e) Put in place a coordination mechanism that will ensure the exchange of relevant communications between the Commission's members every three months; and
- f) Prepare and provide to the CBSC the SEPHC CB needs for the period 2013/2017 for its inclusion in the 5-year CBWP.

Finally, it was agreed to hold the 11th SEPHC Meeting in June 2013 in Lima, Peru.

The ENC Workshop on Data Standardization was opened by Captain CARRASCO, Director of SHOA, and attended by delegations from Brazil, Chile, Colombia, Ecuador, Mexico, Peru and the IC-ENC. A detailed presentation was given by the representatives of IC-ENC and



detailed technical discussions took place during the following days on standardized data contained within ENC's. CARIS, ESRI and HEMISPERE GPS also participated in the Workshop and briefed the participants on new developments in the field of GIS and specialized softwares.



*10th SEPHC Meeting. From left to right: RAdm GAVIOLA - Peru ; Capt. GORZIGLIA – IHB ; Capt. CARRASCO – Chile and RAdm. SANTAMARIA – Colombia. (Not in the photo LtCdr. ZAPATA – Ecuador)*

*Capt. CARRASCO, Director of SHOA, at the Opening of the ENC Workshop on Data Standardization.*



### **55<sup>th</sup> MEETING OF THE NORDIC HYDROGRAPHIC COMMISSION** Stavanger, Norway, 4-6 April 2011

The 55<sup>th</sup> meeting of the Nordic Hydrographic Commission (NHC) took place in Stavanger, Norway, between Monday 4<sup>th</sup> April and Wednesday 6<sup>th</sup>, chaired by the Director of the Norwegian Hydrographic Service. Fifteen representatives participated, from five States representing Denmark, Finland, Iceland, Norway and Sweden. VAdm. Alexandros MARATOS represented the Bureau. In his statement the President informed the participants on the status of the approval of the Protocol of Amendments to the Convention of the IHO, indicating that if the needed 19 additional approvals will be achieved by the end of the year then the Conference next year will become Assembly and the first Council will be elected. He further indicated the various subjects that the Organization is considering with IMO, like the status of ENC coverage, e-Navigation, et cetera and the cooperation with IALA.

The Commission examined various technical issues of interest to all participants. They discussed progress of work of the Nordic Chart Production Expert Group (NCPEG), of the Nordic Data Quality WG, they considered the results of the workshop on the validation of multibeam data, various regional projects like MonaLiza, BLAST and CHEMSEA and the general trends and policy within the area of nautical charting and hydrographic surveying.

Participants presented the national reports highlighting issues of interest to the Commission. The second day the meeting continued onboard the training vessel M/S GANN. There was a session organized jointly with the Standardization of Nautical Publications WG that was meeting the same period in Stavanger.

Mrs. Charlotte WIIN HAVSTEEN from Denmark was elected the new Chair of the NHC. The next meeting will take place in Copenhagen and the dates will be provided later.

**17<sup>th</sup> MEETING OF THE MEDITERRANEAN AND BLACK SEAS  
HYDROGRAPHIC COMMISSION (MBSHC)  
Athens, Greece, 1 – 03 June 2011**

The 17<sup>th</sup> meeting of the Mediterranean and Black Seas Hydrographic Commission (MBSHC) was held in Athens, Greece, on 1-3 June 2011, under the Chairmanship of Rear Admiral Hakan ERAYDIN, the Director of the Turkish Hydrographic and Oceanographic Service. Thirty-seven representatives participated from Algeria, Croatia, Cyprus, France, Greece, Italy, Morocco, Romania, Slovenia, Spain, Tunisia, Turkey, Ukraine, Georgia, Malta, UK, USA, the Intergovernmental Oceanographic Commission (IOC) and PRIMAR Stavanger. Vice Admiral Alexandros MARATOS represented the IHO.

VAdm MARATOS reported on: the Organization's activities during the intersessional period; the cooperation with other international organizations and in particular with IMO, IOC and IALA; issues being progressed by subsidiary bodies of the Organization; and the preparations for the International Hydrographic Conference to be held in April next year. Specific time was dedicated to discussion on the status of the adoption of the amendments to the IHO Convention and on the way in which the approval procedure could be accelerated.

During the meeting the progress of production of INT Charts and ENCs, the promulgation of MSI in NAVAREA III, the report of the WG for the Safety of Navigation in the Black and Azov Seas, the Capacity Building needs and requirements in the region and the results of technical visits were discussed and debated in detail. Participants provided detailed national reports. Georgia noted their efforts to enhance their hydrographic capabilities through bilateral arrangements, and indicated that they would soon apply for membership of the Organization.

The next meeting is scheduled for 2013 under the Chairmanship of its new Chair Commodore Alexandros THEODOSIOU, the Director of the Greek Hydrographic Office. The venue for the meeting will be organized by the Chair.

## **COMMITTEES / SUB-COMMITTEES / COMMISSIONS**

### **LIAISON WITH IALA E-NAVIGATION COMMITTEE CONCERNING S-100**

Brussels, Belgium, 12 January 2011.

Captain WARD and the Chairman of TSMAD, Mr. Barrie GREENSLADE (UK) attended a meeting with the Secretary-General of the International Association of Lighthouse and Aids to Navigation authorities (IALA), Mr. Gary PROSSER and the Chair and Vice-chair of the IALA e-Navigation Committee and the Chair of the committee's data infrastructure working group in Brussels on 12 January 2011. The meeting was the first liaison meeting between IALA and the IHO concerning IALA's interest in using the IHO S-100 data framework standard and the associated Geospatial Information Registry to fulfil its emerging data transfer requirements.

As a result of the meeting, the IALA officers confirmed that their organization would be evaluating S-100 and the use of the S-100 GI Registry for Automatic Identification of Ships (AIS) messaging, inter Vessel Traffic Systems (VTS) exchange format (IVEF) and Aids to Navigation (AtoN) information and will report back to the IHO on the results.

### **CIRM ANNUAL MEETING**

The Hague, Netherlands, 11-12 April 2011

The Comité International Radio-Maritime (CIRM) held its annual Conference in Scheveningen, Netherlands, on 11 and 12 April. CIRM is the body representing the maritime electronics industry in the development of relevant international regulations and standards and is recognised by the IHO as a Non- Governmental International Organization. CIRM maintains an active role in the IHO Hydrographic Services and Standards Committee (HSSC), with a number of its members also participating as Expert Contributors on various HSSC Working Groups.

Captain WARD represented the IHO at the Annual Meeting of CIRM and provided an update on issues and activities of interest to CIRM members, and in particular the relevance of the IHO S-100 geospatial data standard to the e-Navigation concept currently under development by the IMO. He also highlighted various ECDIS equipment and software kernel issues that are beyond the control of the IHO and will require action from manufacturers to rectify.

Alongside Captain WARD, the Secretary-General of the International Maritime Pilots' Association (IMPA), the Head of the Operational Safety Section of the IMO , and representatives of the International Harbourmasters' Association (IHMA), and the International Electro-technical Commission (IEC) also attended the meeting as observers.

After the meeting, Captain WARD visited the Netherlands Hydrographic Office, where he was greeted by Captain FLOOR DE HAAN, Hydrographer of the Netherlands. Captain WARD was given a tour of the facilities and discussed topical IHO issues with senior members of the staff.

**IHO WORLD-WIDE NAVIGATIONAL WARNING SERVICE –  
SUB COMMITTEE (WWNWS-SC)**

**MARITIME SAFETY INFORMATION TRAINING COURSE**

Niteroi, Brazil, 16-18 May, 2011

A Maritime Safety Information (MSI) Training Course was held on 16-18 May 2011 at the Diretoria de Hidrografia e Navegação (DHN), Niterói RJ, Brazil, on behalf of the International Hydrographic Organization (IHO) Capacity Building Committee (CBC) and the IHO World-Wide Navigational Warning Service – Sub Committee (WWNWS-SC), for the benefit of countries in the area covered by the South West Atlantic (SWAHC), South-East Pacific (SEPHC) and the MESO American & Caribbean Sea (MACHC) Hydrographic Commissions. Instructors were Mr. Guy BEALE (United Kingdom Hydrographic Office, UK), Mr. Christopher JANUS (National Geospatial Intelligence Agency, USA), supported by Capt. Josué Alexandre FONTAINHA (NAVAREA V Co-ordinator, Brazil), Cdr Alejandro Lucio José LÓPEZ (NAVAREA VI Co-ordinator, Argentina), Capt. Oscar HENRÍQUEZ CARVALLO (NAVAREA XV Co-ordinator, Chile). Participants were from the following countries: Antigua & Barbuda (1), Argentina (2), Brazil (4), British Virgin Islands (1), Chile (2), Colombia (1), Ecuador (2), Grenada (1), Peru (2), Suriname (1) and Uruguay (1).

This was the 8<sup>th</sup> learning opportunity facilitated by the WWNWS-SC as a capacity building first phase initiative since the programme began in 2007, and it was the first time that 3 Hydrographic Commissions were brought together for a course of this type, resulting in considerable cost benefits in comparison with holding a separate course in each region. The objective of the course was to increase the flow of MSI to all the NAVAREA Co-ordinators for promulgation, and ultimately to emphasise the importance of establishing expertise in the countries within these NAVAREAs, to fulfil the role of National Co-ordinators. To achieve this, the course was designed to provide practical instruction and guidance to participants who are involved with MSI and the drafting of Navigational Warnings, or with the issuance of MSI for the high seas. The aim of the course was to ensure that all attendees would:

- Endeavour to be informed of all events that could significantly affect the safety of navigation within their coastal region;
- Assess all information in the light of knowledge for relevance to navigation in the coastal region;
- Draft navigational warnings in accordance with the Joint IMO/IHO/WMO Manual on MSI;
- Pass NAVAREA warnings for further promulgation to the NAVAREA Co-ordinator, using the quickest means possible.



*Attendees at the MSI Course in Niteroi,  
Brazil*



The course was run over a period of 3 days which included 2 days of practical exercises. The course also included a very useful and informative visit to the NAVAREA V Operations Room and the bridge of a Brazilian Naval vessel, onboard which arrangements had been made for real-time SafetyNET messages to be received. The analysis of the final practical exercises recorded a score of 83% of answers rated "Good" or "Very Good".

### **9th IHO CAPACITY BUILDING SUB-COMMITTEE MEETING**

Niteroi, Brazil, 23-25 May 2011.

The 9<sup>th</sup> meeting of the IHO CBSC was held in Niteroi, Brazil, from 23 to 25 May 2011, under the chairmanship of Mr. Janis KRASTINS, Hydrographer of Latvia. All Members were present. Representatives from the following countries and industry attended as observers: Brazil, China, Colombia, Nigeria, Venezuela and RTCA. In total, 37 participants attended.

The Chairman provided an overview of the activities undertaken since the last meeting in 2010 highlighting the main matters that required special attention by the Sub-Committee during the sessions.

The Sub-Committee:

- Reviewed the Action List agreed in 2010, confirming that almost all matters had been properly covered;
- Examined the performance of the CBFund and fully supported the management of the Fund. Decided to request beneficiary RHCs to improve timing and details when requesting the refund of costs. The representative of the Republic of Korea announced that his Government was going to increase the contribution to the IHO CBFund to US\$ 400,000; this information was welcomed by the Committee who expressed its appreciation;
- Exchanged experiences in the implementation of the 2010 and 2011 CBWP and reviewed the performance and planning of activities associated with the 2011 IHO CBWP and, based on new information received from the RHC representatives, the 2011 CBWP was adjusted;
- Reviewed the CB projects submitted by the RHCs and adopted the 2012 IHO CBWP that will be included in the general IHO WP for 2012.

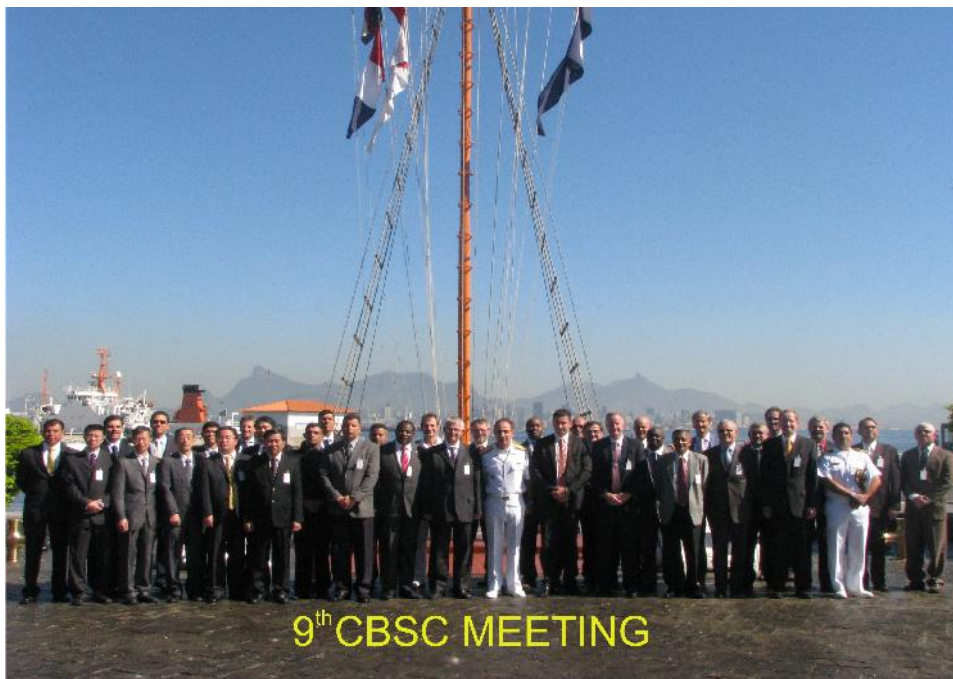
The Sub-Committee agreed, among others, on the following actions:

- to prepare a document proposing a mechanism to obtain the contracted support of CB coordinators to help RHCs to manage CB matters;
- to submit IRCC3 initiatives related to C-55 and related to Performance Indicators (PI), worked on by a Task Group established at the meeting. The analysis of the PI associated with the Sub-Committee is to be continued by this Group that will report at CBSC10;
- to request the support of the IHB to implement the Management Plan Model developed by Norway, approved by the CBSC and considered a vital tool to support the administration of the projects supported by the CBFund and to invite IHB to continue the standardization process to offer training programs associated to the basic level on MSI, hydrographic survey and nautical cartography;
- to prepare, jointly with the IHB, the draft content for an awareness raising seminar to be delivered to IMO countries - mainly those least hydrographically developed – (using as a model the seminars organized by HCA to ATCM and others) and submit the draft to CBSC members for comments. Assess the interest of potential recipients and, if positive, prepare a proposal for IMO endorsement;
- to invite IHB to prepare a draft Procedure 6 based on the progress so far achieved, the discussions held, the contribution received from observers and the original intention to establish a project implementation plan and payment procedure.

The Chairman announced that, due to his new appointment as Maritime Authority of Latvia, he would not be able to continue as Chair. The Vice Chair, Cdr. Brian CONNOR (USA), also announced that he could not continue serving in the CBSC due to new responsibilities assigned within the US Navy. In view of this situation, the Sub-Committee elected Mr. Thomas DEHLING (Germany) as Chair, and Captain Vinay BADHWAR (India) as Vice Chairman. Captain GORZIGLIA, IHB Director, assured the new CBSC authorities of the continued support from the IHB and confirmed that Captain Alberto PEDRASSANI COSTA NEVES, new Professional Assistant at the IHB, had been appointed as the CBSC Secretary.

The UK representative offered to host CBSC10 in UK, in the first week of June 2012, probably in conjunction with the IRCC4, if so decided. The Sub-Committee gratefully accepted the invitation to hold the 10th meeting in the UK, venue to be decided, in the first week of June 2012.

Finally, the Sub-Committee thanked Brazil and, in particular, the Directorate of Hydrography and Navigation for having provided such excellent facilities and outstanding organization and support to ensure a successful meeting.



*The Brazilian Hydrographer, Vice Admiral Luis Fernando PALMER, host of the CBSC9 with the 36 Members and Observers who attended the 9<sup>th</sup> CBSC Meeting. Niteroi, Brazil, 23-25 May 2011.*

### **3<sup>rd</sup> MEETING OF THE IHO INTER REGIONAL COORDINATION COMMITTEE (IHO-IRCC3)**

Niteroi, Brazil, 26-27 May 2011

The Third Meeting of the IHO Inter Regional Coordination Committee (IRCC3) was held at the Directorate of Hydrography and Navigation, Niteroi, Brazil, from 26 to 27 May 2011. The Chairs, or Representatives, of all Regional Hydrographic Commissions, Sub-Committees and other bodies (except for WWNWS and IBSC) and delegates from individual IHO Member States and one NGIO accredited to the IHO attended the meeting. The IHB was represented by Captain Hugo GORZIGLIA (IHB Director and IRCC Secretary) and Captain Alberto PEDRASSANI COSTA NEVES (Professional Assistant). In total, there were 44 participants at the meeting.

IGA Gilles BESSERO (France) and Chair of the IRCC opened the meeting and welcomed the IRCC Members and Observers. He began by expressing his sincere condolences to the Brazilian hosts on the recent loss of Vice Admiral Santos FRANCO (Brazilian Navy), who had been a Director of the IHB from 1962 to 1967. He then emphasized the importance of the meeting in the light of the XVIII<sup>th</sup> International Hydrographic Conference that will take place in Monaco in April 2012. He concluded by thanking the Brazilian hosts for having organized the meeting and for providing the excellent facilities.

Vice Admiral Luis Fernando PALMER (Brazil) welcomed the delegates and gratefully acknowledged the kind words expressed concerning Vice Admiral Santos FRANCO. Captain Wesley CAVALHEIRO provided administrative and logistic information.

The Chairman gave a general overview of events and activities since IRCC2 which were relevant to the Committee within the scope of the IRCC Work Programme. Then followed a review of the actions agreed in 2010 highlighting the status of IHO Chairmanship and the ratification process of the Protocol of Amendments to the IHO Convention. RHC representatives provided information on the current status in their Commissions as well information on other actions agreed at the IRCC2. The IRCC Chairman invited Members of the IRCC to report briefly on the activities of their bodies and to introduce recommendations or other items relevant for IRCC consideration, as appropriate.

After having discussed the reports, the Committee agreed on actions to be undertaken collectively or individually by the different IRCC bodies, as appropriate. Among others, the following actions were highlighted:

- Implement actions to accelerate the process of ratification of the Protocol of Amendments to the IHO Convention in order to meet the end of 2011 deadline;
- Request the IHB to invite the Monaco Government to send a Diplomatic Note to governments of MSs that have not yet ratified the Protocol of Amendments to the IHO Convention in order to reiterate the importance of meeting the end of 2011 deadline;
- Conduct a meeting to design a framework for C-55 development;
- Incorporate in the periodic evaluation of the availability of ENC submitted to IMO (NAV) consideration on the impact of poor bathymetric data availability, datum mis-adjustment problem, and other relevant factors;
- Prepare a report on the implementation of the WEND principles, including feedback from industry to be submitted to the IHB for consideration by the XVIII IHC ;
- Inform HSSC on IRCC views on the way forward in interacting with stakeholders and submit a report to the XVIII IHC;
- Provide input for the preparation of the 2012 IHO WP and cooperate with the IHB in the preparation of the 2013-2017 IHO Work Programme and Budget to be submitted to the XVIII IHC.

Following the kind invitation from the UK (UKHO), the Committee agreed to hold its next meeting (IRCC4) in the first week of June 2012, in a venue to be decided, immediately following the CBSC10 meeting that will take place the three previous days.



*Group photo of the IRCC3 participants.*

### **2011 MEETING OF THE ICA COMMISSION ON GEOINFORMATION INFRASTRUCTURES AND STANDARDS**

Monaco, 27-29 June 2011

The IHB hosted the 2011 meeting of the ICA Commission on Geoinformation Infrastructures and Standards. The meeting was chaired by Mr. Antony COOPER (South Africa). The IHB was represented by Ing. en chef Michel HUET and Capt. Alberto COSTA NEVES. Topics addressed by the meeting included:

- Finalisation of a paper entitled "An initial formal model of a spatial data infrastructure from the computational viewpoint", which will be submitted to the International Journal of Geographical Science;
- Extensive discussion on how the paper "Extending the formal model of a spatial data infrastructure to include volunteered geographical information", could be taken further after its initial presentation at the 2011 International Cartographic Conference held in Paris, France from 4 to 8 July.

The Commission is now planning an open event on ontology, semantics, spatial data infrastructure, data harmonization and land-sea integration, to be held at the IHB in May 2012 and for which it will seek the partnership of the IHO's Marine SDI Working Group (MSDIWG).



*The participants of the meeting.*



## WORKING GROUPS

### **JOINT MEETING OF THE TRANSFER STANDARD MAINTENANCE AND APPLICATION DEVELOPMENT WORKING GROUP (TSMAD) & THE DIGITAL INFORMATION PORTRAYAL WORKING GROUP (DIPWG)**

Seoul, Republic of Korea, 11-15 April 2011

The joint 22<sup>nd</sup> TSMAD and 3<sup>rd</sup> DIPWG meeting took place at the Sejong Hotel in Seoul, Korea (Rep. of), from 11 to 15 April 2011. The meeting was attended by some 40 representatives from the following IHO Member States' Hydrographic Offices: Australia, Denmark, Finland, France, Germany, Japan, Korea (Rep of), Netherlands, Norway, South Africa, Sweden, UK and USA; the following stakeholder organizations: CARIS, ESRI, Jeppesen Marine, Furuno Finland, ECC (Norway), IC-ENC, IIC Technologies, KESTI, SevenCs, T-Kartor and Transas; and the IHB.



*Participants in the joint TSMAD-22 & DIPWG-3 Meeting*

The meeting was opened by the KHOA Director General, Mr. IM Joo Bin. He welcomed the delegates to Korea and thanked the TSMAD and DIPWG participants for their hard work in developing standards for ENC and for the contribution that these standards make in ensuring safety of navigation.

Unfortunately, the DIPWG Chair (Mr. Colby Harmon, USA) was not able to attend the meeting due to unforeseen events and the joint meeting was consequently co-chaired by Mr. Barrie Greenslade (TSMAD Chair, UK), for TSMAD matters, and Mrs. Julia Powell (DIPWG Vice Chair, USA), for DIPWG matters.

Some of the important topics discussed during the meeting included: the S-101 ENC Product Specification; the S-102 proposed Bathymetric Surface Product Specification; the status of work on a new edition of the S-57 Use of the Object Catalogue (UOC – S-57 Appendix B.1); the S-57 to S-101 open source ENC conversion application; proposed changes to the S-100 General Feature Model; the production of a new version of S-52; how to improve ECDIS cursor enquiry & pick reports; the status of the portrayal register and portrayal catalogue development work; the revised version of ECDIS Chart 1; and the planned production of an ECDIS Test Card. More information on these topics is available from the joint TSMAD-22 / DIPWG-3 meeting document download page on the IHO web site ([www.iho.int](http://www.iho.int)).

The next joint TSMAD/DIPWG meeting has been planned at the IHB, Monaco in early May 2012. Meanwhile, a 23<sup>rd</sup> TSMAD meeting should take place on 16-20 January 2012 in Wellington, New Zealand.

### **3<sup>rd</sup> MEETING OF THE TIDAL AND WATER LEVEL WORKING GROUP (TWLWG)**

Jeju Island, Republic of Korea, 5-7 April 2011.

The 3<sup>rd</sup> meeting of the TWLWG was held at the Hanwa Resort, Jeju Island, Republic of Korea, from 5 to 7 April 2011. Representatives from Australia, Canada, Chile, Finland, France, Japan, Korea, Norway, Peru, South Africa, UK, and the IHB attended the meeting. Steve SHIPMAN, IHB, represented the IOC-GLOSS Group of Experts.

Mr. Ok-Soo KIM, Director of the Oceanographic Division of the Korean Hydrographic and Oceanographic Administration (KHOA), welcomed all participants to the wonderful island of Jeju.

Topics discussed included: a standard for digital tide tables; the dynamic application of tides in ECDIS; a standard for the transmission of real-time tidal data; a revised definition of Mean Sea Level and the revision of IHO resolutions on tides and water level topics. The meeting report and all papers and presentations are available from the TWLWG section of the IHO web site.

The meeting agreed to hold TWLWG4 in Cape Town, South Africa, from 8-10 May 2012.



*TWLWG3 on a visit to the Jeju Port Tide Gauge*

## **BALTIC SEA INTERNATIONAL CHARTING COORDINATION WORKING GROUP (BSICCWG) MEETING**

Norrköping, Sweden, 9–10 June 2011

Although the BSICCWG has been working by correspondence for many years, it held its first physical meeting in Norrköping, Sweden, on 9-10 June 2011. The meeting was chaired by Mr. Jarmo MÄKINEN and Mr. Juha KORHONEN acted as Secretary. Members from Denmark, Finland, Germany, Latvia, Sweden and the IHO participated in the meeting, and discussed issues related to international chart coordination in the Baltic Region. Some of these issues included: proposed new routing measures, the use of national languages in chart titles, the exchange of ENC data in Nordic countries for paper chart production, a proposal for revising the section of the S-23 publication for the Baltic Sea area, exchange of information and updates (NtMs) for adopted charts and the development of an online catalogue showing INT chart coverage in the Baltic Sea region.

The Working Group proposed holding the next meeting in 2013.



## **4<sup>th</sup> MEETING OF THE IHO DATA QUALITY WORKING GROUP (DQWG)**

Helsinki, Finland, 14-17 June 2011

The 4<sup>th</sup> meeting of the IHO Data Quality Working Group (DQWG) was hosted by the Finnish Transportation Agency (FTA) in Helsinki, Finland, on 14-17 June 2011. DQWG, one of the ten working groups of the Hydrographic Services and Standards Committee (HSSC), is tasked to develop appropriate methods of classifying and depicting the quality of digital hydrographic data. Twelve persons, representing the Hydrographic Offices of Canada, Finland, The Netherlands, Norway, Slovenia, Sweden and the United Kingdom, plus the IHB and an expert contributor from Jeppesen Marine, attended the meeting which was chaired by Mr. Chris HOWLETT (UK). The main points discussed included:

### S-57 and S-52

1. A recently conducted survey had revealed that many ENC users do not make use of the attribute CATZOC. The existing method of portraying data quality (i.e. CATZOC and its “stars”) therefore appears to be inadequate. ENC users in the survey expressed a strong



preference for an on-demand (via toggle function) data quality colour or pattern fill. As a result, the DQWG will propose, for example, that one colour be used to show areas of poor data quality, another colour to show areas of average data quality and no colour fill for areas of sufficient data quality.

2. The DQWG agreed that a set of guidelines on how to populate CATZOC (and also M\_QUAL), should be included in the “Use of the Object Catalogue” (S-57 Appendix B.1). Noting the lack of consistency in the way CATZOC is populated for legacy data but also taking into account the effort that many HOs have already put into populating CATZOC, this guidance would be mindful of limiting the amount of reassessment that any new data quality methods would require.

### S-101

3. The DQWG considered that the following quality indicators are important for mariners: horizontal uncertainty, vertical uncertainty, uncertainty of existence, and temporal variation. There should be one attribute to capture the uncertainty of horizontal positional measurements, vertical positional measurements and distances, at the 95% confidence level.

4. The DQWG considers that CATZOC should not be used in S-101 – the Product Specification for the next generation ENC. However, the supporting attributes, i.e. position and depth uncertainties, and seafloor coverage, should be retained, to allow S-101 systems to use the combined attribute values to drive other methods of portraying data quality. The S-101 feature catalogue would need to be extended with attributes for capturing each of seafloor coverage and size of feature detected.



5. Based on the above, the DQWG will now prepare and forward a data quality component for S-101 to the relevant TSMAD sub-working group, to be completed before the end of 2011.

The meeting elected Mr. Rob HARE (Canada) and Mr. Eivind MONG (Jeppesen) as DQWG Vice-Chair and Secretary, respectively. The next meeting of DQWG has been planned to be held at the IHB in the week commencing 14 November 2011.

## **OTHER BODIES**

### **MEETING WITH SECRETARIAT OF THE PACIFIC COMMUNITY AND THE PACIFIC ISLANDS APPLIED GEOSCIENCE COMMISSION**

Suva, Fiji, 4 January 2011.

The Secretariat of the Pacific Community (SPC) assists the people of the Pacific region by delivering a wide range of technical, research, educational and planning services to its 26 Member States: American Samoa, Australia, Cook Islands, Federated States of Micronesia, Fiji Islands, France, French Polynesia, Guam, Kiribati, Marshall Islands, Nauru, New Caledonia, New Zealand, Niue, Northern Mariana Islands, Palau, Papua New Guinea, Pitcairn Islands, Samoa, Solomon Islands, Tokelau, Tonga, Tuvalu, United States of America, Vanuatu and Wallis and Futuna.

Establishing closer ties with SPC and the Pacific Islands Applied Geoscience Commission (SOPAC) has been a goal of the South West Pacific Hydrographic Commission (SWPHC) for some time. In order to make further progress, Captain WARD met the Director General of SPC, Dr. Jimmie RODGERS and the Director of SOPAC, Dr. Russell HOWARTH in Suva, Fiji on 11 January, together with other members of the staff.

At the meeting it was agreed that the state of hydrography and nautical charting in the SPC region should be made a particular priority in SPC and brought to the attention and recognised by all its Member State governments. Furthermore, there was potential for SOPAC, as a subordinate agency of SPC to be developed into the regional hydrographic data gathering capability and for the Pacific Maritime Authority (PacMA), another SPC agency, to act as an expert advisory body to SPC regarding the requirements and prioritisation of nautical charting and hydrography in the island States. In both regards, the active involvement of the IHO and the SWPHC was seen as a vital element to success.

The Director-General proposed that gaining an appropriate level of recognition of issues related to hydrography and nautical charting services by governments in the region would be best achieved through agreeing a Memorandum of Understanding between the IHO and SPC. He proposed that such an MoU could be presented to the Governing Council of the SPC when it meets towards the end of 2011. Work is now underway between the SPC and the IHB to develop a suitable text. This text will be presented to IHO Member States for their approval prior to being forwarded to the SPC Governing Council.

### **IMO E-NAVIGATION CORRESPONDENCE GROUP CHAIRMAN'S FORUM**

Brussels, Belgium, 11 January 2011.

The Chairman of the IMO Correspondence Group on e-Navigation, Mr. John Erik HAGEN (Norway) held a small, informal meeting of invited representatives in Brussels on 11 January. Captain WARD represented the IHO at the meeting. The purpose of the meeting was to assist the Chairman in developing his next round of proposals for consideration by the IMO Correspondence Group – and in particular, to define and focus the scope of the work of the Correspondence Group in preparation for various reports to be submitted to the IMO during 2011.

The discussions at the meeting covered how best to identify the key tasks and benefits that will be addressed by e-Navigation when it is implemented. There were no new or significant issues raised during the meeting related to hydrography or nautical charting services.



**WORKSHOP ON ECDIS SOFTWARE ISSUES**  
International Hydrographic Bureau, Monaco, 15-16 February 2011

A workshop to discuss ECDIS Software Issues was held at the IHB on 15 and 16 February 2011. The workshop was attended by 37 leading representatives drawn from various ECDIS stakeholder groups including the IMO Secretariat, IHO and IMO Member States, Intergovernmental Organizations, Non-Governmental International Organizations, data service providers, ECDIS manufacturers and type-testing authorities. The Chair and Vice-Chairs of HSSC and TSMAD also attended the workshop.

The workshop was hosted by the IHB as a result of a submission to the 88<sup>th</sup> meeting of the IMO Maritime Safety Committee (MSC) made by Japan, Norway, the United Kingdom, the International Chamber of Shipping (ICS) and the International Federation of Shipmasters' Association (IFSMA) who brought to the attention of the Committee certain operating anomalies that had been identified within ECDIS.

The workshop participants noted that, whilst the workshop was focussed on overcoming certain issues, it should not be forgotten that ECDIS was already installed and operating in a considerable number of vessels and is largely performing as expected, thereby assisting the improvement of safety of life and the protection of the marine environment.

The discussions at the meeting reflected four principal themes:

- the requirement for software in ECDIS equipment already fitted in ships to be periodically upgraded when appropriate;
- improving mariner awareness of the need to upgrade ECDIS software;
- improving the consistency of data encoding in ENCs; and
- the need for a coordinated reporting, assessment and feedback mechanism for ECDIS-related equipment performance issues.

There was a clear view at the meeting that there is a need for the relevant committees of the IMO to clarify how software dependent equipment such as ECDIS should be treated. In particular, clarification is required on the maintenance and updating of the operating system software and the data rendering software so as to comply with any changes in associated standards introduced after the date of type approval and fitting of the equipment in ships.

The meeting supported a concept of developing a simple user validation test as a direct way of drawing mariners' attention to the need to keep software dependent systems up to date.

The meeting agreed that there was a need to improve the production consistency of ENCs from some Hydrographic Offices by removing any ambiguities or room for discretion in IHO Standards wherever possible and by encouraging Hydrographic Offices to adhere to the IHO WEND principles and the ENC Product Specification standard.

Finally the meeting noted that the IHO has effective mechanisms in place to address any technical charting issues that are under its direct control but agreed that there was a need to consider establishing a centralised reporting / collating / feedback mechanism or clearing-house through which any apparent inconsistencies in ECDIS performance or standards could be reported and subsequently coordinated and addressed to the relevant authorities. An IHO Member State volunteered to liaise with relevant maritime and other ECDIS stakeholders to consider this issue further and subsequently develop a proposal for further consideration.

The IHB provided a short report on behalf of the IHO on the outcomes of the workshop for consideration at the next meeting of the IMO Maritime safety committee due to meet in May 2011.

**15<sup>th</sup> SESSION OF IMO COMSAR**  
IMO Headquarters, London, UK, 7-11 March 2011

The 15<sup>th</sup> session of COMSAR was held at the IMO HQ in London, from 7 – 11 March 2011. The President, PAH and the Chairman of WWNWS represented the IHO. The Coordinators from: NAVAREA 1 (UK); NAVAREA II (France); NAVAREAs IV and XII (USA); NAVAREAs XVII and XVIII (Canada) and NAVAREA XIX (Norway) were represented.

The Sub-Committee considered submissions by the IHO and approved a draft revised NAVTEX Manual, which will now go to MSC 89 for adoption. The Sub-Committee also approved the issue of a revised COMSAR Circular regarding the details of NAVAREA Co-ordinators and noted the IHO report on the outcome of WWNWS2. The Sub-Committee ISO approved a draft IMO Assembly Resolution on the World-Wide Met-Ocean Information and Warning Service, which will complement Resolution A.706(17), as amended, on the World-Wide Navigational Warning Service. This will now go to MSC89 for approval and subsequent adoption by Assembly 27 in November 2011.

COMSAR 15 continued its scoping exercise on the review of the GMDSS and established a CG to pursue this work which is due to complete at COMSAR 16 in 2012. COMSAR also continued its work on e-Navigation and provided feedback to the CG established by the NAV Sub-Committee and to NAV57 which will be held in June 2011. In particular COMSAR agreed that IHO's S-100 data model should be used as a baseline for creating a framework for data access and information services under the scope of e-Navigation and that the IMO, in consultation with other organizations, should consider the establishment of a Harmonization Group on creating a framework for data access and information services under the scope of SOLAS, based on the example of the IMO/IHO Harmonization Group on ECDIS.

Members of the WWNWS WG (France, UK, USA, Inmarsat, WMO and IHB) reviewing the WWNWS documentation, set up at CPRNW7 in 2005, met in the week following COMSAR. Following the completion of the review of all WWNWS documents: IMO Resolutions A.705(17), as amended; A.706(17), as amended; the joint IMO/IHO/WMO MSI Manual and IHO publication S-53; the International SafetyNET Manual; and the NAVTEX Manual, the WG reviewed all approved texts for consistency of terminology. Some further minor editorial corrections were agreed. These will be discussed further at WWNWS3 and further reviewed in 2012 prior to any further submission to IMO COMSAR.

**9<sup>th</sup> MEETING OF THE IALA COMMITTEE ON E-NAVIGATION**  
Copenhagen, Denmark, 14 - 18 March 2011

The 9<sup>th</sup> meeting of the Committee on e-navigation of the International Association of Aids to Navigation and Lighthouse Authorities (IALA) took place at the National Museum of Denmark in Copenhagen between 14 and 18 March. Over one hundred delegates were in attendance. Captain WARD represented the IHO.

The IALA Committee on e-Navigation was formed to develop IALA policy and technical proposals on various aspects of e-Navigation, both for the benefit of its own members but also to forward proposals and comments to the IMO, the organization that is developing the e-Navigation concept. In accordance with the Memorandum of Cooperation between IHO and IALA, the IHO is providing advice and assistance to IALA in relation to relevant hydrographic and nautical charting aspects of e-Navigation.

Captain WARD contributed, in particular, to the work of the committee's subordinate Working Group 5 that is studying data architecture. In this context, the IHO's S-100 is likely to become an underpinning data structure standard for IALA in the future.



*IALA e-Navigation Committee meeting at the National Museum of Denmark*

### **3<sup>RD</sup> PREPARATORY MEETING FOR THE PROPOSED UN COMMITTEE ON GLOBAL GEOSPATIAL INFORMATION MANAGEMENT (GGIM)**

UN Headquarters, New York, 4-6 April 2011.

A proposal will be put before the UN Economic and Social Council (ECOSOC) in July to establish a UN Committee of Experts on Global Geospatial Information Management (GGIM). This follows increasing awareness by UN Member States of a need for an inter-governmental consultative mechanism that can play a leadership role in setting the



agenda for the development of global geospatial information and to promote its use to address key global challenges; to liaise and coordinate among Member States, and between Member States and international organizations. The IHO will be invited to participate as an Observer organization in the GGIM.

The GGIM is intended to provide clear strategic guidance on global spatial data infrastructures, requirements and priorities, help promote the necessary levels of government support and put in place any necessary capacity building.

A third preparatory meeting for the GGIM, comprising representatives from nearly 30 UN Member States together with representatives from the principal non-governmental international organizations concerned with global geographic information management was held at the UN Headquarters in April.

The meeting reviewed the UN Secretary-General's report and its recommendations intended for consideration by the ECOSOC and the proposed Terms of Reference and Vision Statement for the GGIM. The meeting went on to discuss and provide input to the agenda and arrangements for the first UN World Forum on Global Geospatial Information Management to be hosted in Seoul, Korea from October 24 to 28.

Captain WARD represented the IHO at the 3rd preparatory meeting. He informed the meeting about the IHO's role and relationship with the UN as its recognised competent authority on hydrography and nautical charting services and the well established IHO mechanisms and standards that are already in place to assist in the exchange and availability of hydrographic information in standardised forms across the globe.

## **89<sup>th</sup> SESSION OF THE IMO MARITIME SAFETY COMMITTEE (MSC89)**

IMO Headquarters, London, 11-20 May 2011.

The 89<sup>th</sup> session of the IMO Maritime Safety Committee (MSC89) was held at the IMO Headquarters in London from 11 – 20 May 2011. The President and PAH represented the IHO.

MSC89 considered the report of the COMSAR Sub-Committee and took the following actions of relevance to the IHO: approved the draft revised NAVTEX Manual; approved the issue of the revised COMSAR Circular on NAVAREA Co-ordinators' operational contact information; authorised the IMO Secretariat to issue further revisions to the above COMSAR Circular upon receipt of updated information from a NAVAREA Co-ordinator or the IHO; and agreed the draft text of the Assembly Resolution on a World-Wide Met-Ocean Information and Warning Service which will now go to the 27<sup>th</sup> session of the IMO Assembly in November 2011 for adoption.

The MSC thanked the IHO for the submission of its paper highlighting the cooperative efforts between IMO and IHO for improving Safety of Navigation (Document MSC89/INF.10). The MSC also appreciated the information provided by the IHO on its Workshop on "Operating Anomalies in ECDIS" (Document MSC89/24/2). This matter will be considered further at the 57<sup>th</sup> session of the NAV Sub-Committee.

The full report of MSC89 will be made available on the IHO web site.

## **57<sup>th</sup> SESSION OF THE IMO SUB-COMMITTEE ON SAFETY OF NAVIGATION (NAV)**

IMO Headquarters, London, 6-10 June 2011.

The 57<sup>th</sup> session of the IMO Sub-Committee on Safety of Navigation (NAV) was held at IMO Headquarters in London, from 6-10 June 2011. The IHO was represented by Vice Admiral MARATOS, President, Captain WARD, Director, and Lt. Cdr. SHIPMAN, PAH. Several heads and representatives of hydrographic offices also attended the meeting as part of national delegations.

NAV57 approved three new/amended Traffic Separation Schemes (TSS) and nine new/amended Routeing Measures all of which will now be passed to the Maritime Safety Committee (MSC) for adoption at its 90<sup>th</sup> session in May 2012. Implementation will be not less than six months after adoption by the MSC.

NAV57 continued its work on the development of an implementation plan for e-navigation focussing attention on the report of the intersessional Correspondence Group (CG). NAV57 decided to recommend to the MSC the adoption of IHO's S-100 standard as the baseline for data access and services under the scope of SOLAS. NAV57 has also proposed that the MSC establish an IMO/IHO Harmonization Group on Data Modelling. The CG was re-established with revised Terms of Reference and instructed to make a preliminary report to COMSAR 16 in March and STW43 in May and to provide a consolidated report to NAV58 in July 2012. NAV57 agreed to request an extension of the completion date on this topic to 2014.

On the topic of AIS Aids to Navigation NAV57 concluded that it was necessary to establish a policy before any consideration could be given to symbology. A CG was established to prepare a draft policy document for consideration at NAV58.

Following direction from MSC89, held two weeks previously, NAV57 briefly discussed "Operating anomalies identified within ECDIS". The discussion will be reported to MSC90 and NAV will await further instructions.

The IHO informed the Sub-Committee on the establishment of the Arctic Regional Hydrographic Commission.

The Chair and Vice-Chair, Mr. Michael SOLLOSI of the United States and Mr. Kostiantyn BILLIAR of Ukraine, respectively, were re-elected for 2012.



*IHB and HO delegates attending IMO-NAV57.*

**61<sup>st</sup> SESSION OF IMO'S TECHNICAL COOPERATION COMMITTEE (TC61)**  
IMO Headquarters, London, 21-23 June 2011.

The 61<sup>st</sup> session of IMO's Technical Cooperation Committee (TC61) was held at IMO headquarters from 21 – 23 June 2011. The IHO was represented by Captain Alberto NEVES (PAPM) and Lieutenant Commander Steve SHIPMAN (PAH).

The IHO had submitted document TC61/INF.6 informing the Committee of the IHO's capacity building activities. The IHO had the opportunity to introduce this document during the discussion on IMO's Integrated Technical Cooperation Programme (ITCP). The IHO in introducing the document emphasized the cooperation between IMO and IHO in the delivery of the elements of the ITCP within the IHO's area of competence. The intervention was made on World Hydrography Day and the opportunity was taken to inform the Committee accordingly. During the discussion on this agenda item the Secretary General of IMO reminded everyone of the great synergy between the goals of IMO and IHO. He once again urged the numerous IMO Member States that were not members of the IHO to consider joining the IHO and also stated that he would address this matter again at the next meeting of the IMO Council.

C61 provided the opportunity for the IHO delegates to meet and discuss capacity building matters with representatives of numerous maritime administrations and members of IMO's Technical Cooperation Division.

Admiral OLIMBO (Italy) informed the Committee that he would not be available for re-election as Chairman for 2012 and the Committee elected Mrs Nancy WAKARIMA KARIGITHU of Kenya, the current Vice-Chair, as the Chair for 2012. Dr Youngsun PARK of Korea was elected as the Vice-Chair for 2012.



## XXXIV<sup>th</sup> ANTARCTIC TREATY CONSULTATIVE MEETING (ATCM)

20 June – 01 July, Buenos Aires, Argentina.

The XXXIV Antarctic Treaty Consultative Meeting took place in Buenos Aires, Argentina, from 20 June until 01 July, coinciding with the 50<sup>th</sup> Anniversary of the entry in force of the Treaty. Parties and related Antarctic international bodies met as they do it annually, to discuss matters relating the management of the Antarctic Treaty area and to further develop the Antarctic Treaty System.

Participants allocated time to the discussion of the 61 Working Papers (WP), 137 Information Papers (IP) and 7 Secretarial Papers (SP) submitted by different Countries, International Organizations related to the Antarctic in their different conditions and the AT Secretariat. Over 300 people representing the Consultative Parties; the non Consultative Parties and International Organizations were present, including the IHO. Captain Hugo Gorziglia represented the IHO during the first five days.

The Meeting was opened by the Ministry of Foreign Affairs, Mr. Hector Timerman who welcomed all participants and highlighted the importance of the Antarctica. He made emphasis on how successful has been the Antarctic Treaty System that entered in force 50 years ago, particularly for having kept the area free of conflicts; collectively well managed and environmentally protected. Mr. Ariel Manzi from Argentina was elected Chairman of the meeting.

During the first plenary session, Captain Gorziglia introduced IP 114, the IHO report on “*Cooperation in Hydrographic Surveying and Charting of Antarctic Waters*”. Before introducing the paper, Captain Gorziglia thanked the ATCM for having invited IHO to report at the XXXIV<sup>th</sup> ATCM. In his presentation the IHO representative highlighted the encouraging results of the discussions had at governmental, managers, operators and scientific levels, where the message “*Antarctic development needs reliable knowledge of hydrography*” seems to have been well understood. He expressed that it is the IHO’s feeling that the sensible cartographic situation in Antarctica has been and is being faced and treated with seriousness by these different sectors, which are enthusiastically cooperating to improve the shortcomings. Emphasis was also made with regard to the contribution made by several Hydrographic Offices that have allocated resources to the production of ENC’s of Antarctic waters, greatly contributing to improve safety to navigation. Finally, a call to increase the level of hydrographic surveys operations was made, as the only mean to gather new data to support the production of the remaining INT Charts not yet available. The report was very well received by the audience.

Out of the numerous papers presented and discussed, the following are considered to have particular relation with IHO:

### **WP002 Early Warning System for Antarctica of the arrival of waves generated by earthquakes.**

This paper highlights the need to arrange a tsunami warning system for the Antarctica. Certainly shallow water bathymetry will be required for any preparedness measure that might wish to be adopted. This situation confirms and reinforces the need to increase hydrographic surveys in the region.

### **WP 037 Yacht guidelines to complement safety standards of ship traffic around Antarctica.**

The paper refers to many elements contributing to safety, but reference to the need of nautical charting and publications is missing. This generates an opportunity for an IHO contribution to the progress of the development of such guidelines. The point was made and recorded.

**WP38 Antarctic Discussion Forum of Competent Authorities (DFCA) – Impacts of underwater sound to Antarctic waters – and IP 29 Potential of Technical Measures to Reduce the Acoustical Effects of Airguns.**

These two documents refer to the acoustic impact on the marine environment. The first one to the organization of the 2<sup>nd</sup> Workshop of the DFCA in Berlin, Germany, in autumn 2011 to better consider Parties' individual opinions on the impact of anthropogenic underwater sound on the assets to be protected under the EP of the Antarctic Treaty. The second paper refers particularly to airguns used in seismic surveys. The reason to raise these two papers is their relevance in the potential future setting of regulations to conduct hydrographic surveys and its effect in the progress of hydrographic data gathering.

**IP 105 Report on IAATO operator use of Antarctic Peninsula Landing Sites and ATCM Visitor Site Guidelines, 2009-10 & 2010-11 Season.**

The Information provided by this document is useful as a source material for the definition of priority areas, as they are areas of evident high tourism interest where cruise ships go each season.

**IP 108 Report of the International Association of Antarctica Tour Operators 2010-11.**

The content of this report confirms the excellent working relationship that exists between IHO and IAATO. IAATO participation at the HCA meeting in the UK was particularly mentioned as it was the IHO participation at the IAATO 22<sup>nd</sup> Annual Meeting, May 9-12, 2011, Hobart, Tasmania, Australia.

During the meeting several very productive informative discussions took place with the Executive Secretaries of IAATO and COMNAP, as well as with delegations that included hydrographic advisors among their components. This valuable contact offered the opportunity to enhance coordination of future and in progress actions.

Finally, it worth taking note on an important WMO initiative under consideration: the "International Polar Decade". The main goal of this initiative is to launch a process of sustained and coordinated research and observations in the polar regions to meet the requirements of the long-term climate change studies and improve prediction to benefit societal needs. This could constitute an opportunity for hydrography in Antarctica and its development shall be monitored by IHO/HCA.

The next ATCM Meeting shall take place in Hobart, Australia, 04 to 13 June 2012.



*Mr. Hector TIMERMAN, Ministry of Foreign Affairs of Argentina  
at the Opening Ceremony of the XXXIV ATCM.*

## CONFERENCES / SEMINARS

### E-NAVIGATION UNDERWAY CONFERENCE

MV Crown of Scandinavia, at Sea, 31 January to 2 February 2011

As part of the European Union EfficienSea Project, an international conference to consider how e-Navigation test-beds are assisting in the development of the e-Navigation concept was organised on the Baltic Sea ferry *Crown of Scandinavia* by the Danish Maritime Safety Administration.

The conference was attended by over 130 attendees from many parts of the world. Mr Gary PROSSER, Secretary-General of IALA and Captain WARD from the IHB provided opening addresses to the conference. Mr John-Erik HAGEN (Norway), Chairman of the IMO Correspondence Group on e-Navigation also participated. Speakers representing different stakeholder groups provided their different perspectives on e-Navigation. The second day of the conference, during which the venue ferry continued to sail on its route between Copenhagen and Oslo, a number of planned and operational test-beds were described. A test-bed installed on the bridge of *Crown of Scandinavia* was examined by the conference attendees. This test-bed is demonstrating the use of real-time broadcast information including vessel traffic and weather information.



*Ingénieur général de l'Armement Yves DESNOËS, retired Hydrographer of France, expressing his view at the e-Navigation Underway Conference*

Discussions on the third day of the conference resulted in a number of conclusions being reached on how test-beds should be coordinated and used to help test and improve e-Navigation concepts as they are developed. Notably for the IHO, the conference agreed that existing standards and data structures should be used in such test beds, and in particular S-100, in order to explore their suitability for use on a global scale.

The conference also agreed that the IMO specification for Integrated Navigation System (INS) is the most appropriate building block for the implementation of e-Navigation capabilities in ships rather than by making adjustments or adding further requirements to the current ECDIS capabilities.

## INTERNATIONAL HYDROGRAPHIC SEMINAR (HYDROIND 2011)

New Delhi, India, 3 – 4 March 2011

1. The Indian Naval Hydrographic Department (INHD), one of the leading hydrographic departments in the world, derives its origin from the earliest voyages of the Europeans to the Indian Ocean shores dating back to the 17th Century. Post independence, the Naval Hydrographic Department came into its own and assumed the national responsibility for undertaking hydrographic surveys of Indian waters and the production of navigational charts of the region. Its office was established in its present location at Dehradun (India) on 1 June 1954 and christened the “Naval Hydrographic Office (NHO)”. In keeping with its national and international responsibilities, the Office was renamed the “National Hydrographic Office” in 1996. Over the years the National Hydrographic Office has achieved significant milestones in its progress and development to claim international recognition for its services and products.

2. International Hydrographic Seminar: the Indian Naval Hydrographic Department held an International Hydrographic Seminar HYDROIND – 2011, the theme of which was “Hydrography – An Instrument for Regional Cooperation and Maritime Safety” and ten other associated sub-themes. The Seminar was held at the Manekshaw Centre in New Delhi on 3-4 March 2011. The Defence Minister of India, Shri AK Antony, inaugurated the Seminar and released the Coffee Table book titled “Copper to Computer” which gave an insight into the journey of the department over the past few decades and the multifarious capabilities within the organisation. The Honourable Minister for Shipping, Shri GK Vasan, released the Seminar Souvenir on the occasion. The Chief of the Naval Staff, Admiral Nirmal Verma, delivered the key note address to the eminent gathering during the inaugural function. The President of the International Hydrographic Organization, Vice Admiral Alexandros Maratos, very kindly attended the event which was held in the Zorawar Auditorium of the Manekshaw Centre, New Delhi on 3 March 2011.

3. An Exhibition was also held alongside the International Hydrographic Seminar and was inaugurated by the Honourable Defence Minister, Shri AK Antony. The exhibitors comprised representatives from industry who showcased the latest 2 developments in the field of hydrography and cartography. Most of the leading hydrographic equipment manufacturers from all over the world had stalls showcasing their products. A stall showcasing the services and products including ENC’s marketed by the Indian Naval Hydrographic Department was also on display at the exhibition. The seminar attracted a varied participation from a wide diaspora of Hydrographers, cartographers and professionals in allied fields including the maritime industry.



*Keynote address by the  
Chief of Naval Staff*



*Address by the President of IHB*



## VISITS TO IHB

### **VISIT BY STUDENTS FROM THE INTERNATIONAL TRIBUNAL ON THE LAW OF THE SEA (ITLOS)**

IHB, Monaco, 21<sup>st</sup> February 2011

A course leader and six students attending a 9-month course, funded by the NIPPON Foundation, at ITLoS in Hamburg, Germany, visited the IHB on Monday 21 February 2011 where they were given a briefing on “Hydrography and UNCLOS” followed by a Question and Answer Session. The visit was part of the International Liaison section of their course. In addition to the IHB they have visited or will visit the International Maritime Organization (IMO) in London, the International Court of Justice (ICJ) in The Hague and the European Union (EU) in Brussels.

The course leader was from Germany and the students were from: Argentina, Brazil, Greece, Mozambique, South Africa and Togo.



## IHB VISITS

### MISSION TO STOCKHOLM

3-5 May 2011

A meeting - aimed at bringing together the key experts conducting bathymetric mapping in the Arctic and Antarctic waters - was organized by Prof. Martin JAKOBSSON (IBCAO) from the Stockholm University, Sweden and Dr. Hans-Werner SCHENKE (IBCSO) from the Alfred Wegener Institute for Polar and Marine Research, Germany, under the name "Arctic-Antarctic Seafloor Mapping Meeting 2011". This meeting was held in Stockholm on 3-5 May, hosted by the Department of Geological Sciences, Stockholm University.

The International Bathymetric Chart of the Arctic Ocean (IBCAO) and the International Bathymetric Chart of the Southern Ocean (IBCSO) are two projects aimed at compiling the most up-to-date bathymetric portrayals of these two regions. The meeting was identified as a coordination mechanism to improve IBCAO and IBCSO and to discuss the uses and technical requirements of regional bathymetric compilations.

This event was considered to be very important by the IHO Hydrographic Commission on Antarctica, which decided at its last meeting that Captain Hugo GORZIGLIA, IHB Director and Chairman of HCA, should participate. The opening keynote speech was given by the IOC Executive Secretary, Mrs. Wendy WATSON-WRIGHT, on "Why do we need to learn more about the Arctic and Southern Ocean?" and Captain GORZIGLIA reported on the "Status of Hydrographic Surveying and Nautical Charting in Antarctica".

Around 50 people from 15 different countries attended and over 11 oral presentations were given on Arctic Seafloor Mapping and 7 on Antarctic Seafloor Mapping. Also 5 presentations covered new data compilation methods and the situation on IBCAO and IBCSO, followed by separate breakout sessions on the Arctic and Antarctic. In addition, a poster session was organized.

Both IBC projects got organized and identified Members of their respective Editorial Boards. Coordination between these two IBCs and the Arctic Regional Hydrographic Commission (ARHC) and the Hydrographic Commission on Antarctica (HCA), respectively, was considered vital for the improvement of the Sea Floor Mapping of these regions. Technical details and deliverables were also identified and its execution coordinated. GEBCO parent organizations, the IOC and particularly the IHO, were recognized for the efforts made to provide support to the development of the projects. The GEBCO Nippon Foundation Project was identified as a potential support for the development of an Antarctic project, aimed at the continuation of the bathymetric compilation work so far conducted by IBCSO.

In order to follow up and gain momentum, it was decided to have the next joint coordination meeting in May 2012; the venue is yet to be decided.



*From left to right:*

*Prof. Martin JAKOBSSON (IBCAO) from the Stockholm University, Sweden; Captain Hugo GORZIGLIA, IHB Director and HCA Chairman, and Dr. Hans-Werner SCHENKE (IBCSO) from the Alfred Wegener Institute for Polar and Marine Research, Germany.*

## NEW HYDROGRAPHERS

### NEW DIRECTOR OF THE GEORGIAN STATE HYDROGRAPHIC SERVICE

Mr. Revaz BABILUA has assumed the position of Director of the State Hydrographic Service of Georgia. Mr. BABILUA was born in the city of Gagra, in May 1972, and studied in the Faculty of Law at the Tbilisi Javakhishvili University.



### NEW HYDROGRAPHER OF THE REPUBLIC OF KOREA

Mr. Joo Bin IM was appointed General Director of the Korea Hydrographic and Oceanographic Administration on 2 March 2011.

Mr. IM was born in March 1960 in Hongsung, Republic of Korea. In 1983, he graduated from the Yonsei University and in 1985 he obtained a Master's Degree in Science of Public Administration at the Seoul National University.

He began his career at the National Railroad Administration in 1985. Thereafter, he acquired experience in various divisions, including - amongst others - the Railroad Operation Division, the Civil Aviation Team, the Central Land Tribunal of Ministry of Land, Transport and Maritime Affairs.

### ACADEMIC BACKGROUND

- Feb. 1983 - Bachelor Degree in Science of Public Administration, Yonsei University ;
- July 1985 - Master's Degree in Science of Public Administration, Seoul National University.

### PROFESSIONAL CAREER

- March 2011 - General Director, Korea Hydrographic and Oceanographic Administration, MLTM ;
- Aug. '09 - Mar. '11 - Secretary General, Central Land Tribunal, MLTM ;
- Mar. '08 - Aug. '09 - Head of Air Traffic Office, Aviation Safety Authority, MLTM ;
- Mar. '07 - Mar. '08 - Head of Railroad Operation Team, Ministry of Construction and Transportation ;
- Sep. '05 - Mar. '07 - Head of Civil Aviation Team, MOCT ;
- Jul. '03 - Sep. '05 - Director of the Oversea Construction Cooperation Division, MOCT ;
- Dec. '01 - Jul. '03 - Director, Logistics Facility Division, Transportation Policy Office, MOCT.

## INFORMATION OF INTEREST

### MEMORANDUM OF UNDERSTANDING BETWEEN IHO AND SPC

In April the IHO agreed a Memorandum of Understanding (MoU) with the Secretariat of the Pacific Community (SPC).

The Pacific Community, formerly the Pacific Island Commission, comprises 26 States: American Samoa, Australia, Cook Islands, Federated States of Micronesia, Fiji Islands, France, French Polynesia, Guam, Kiribati, Marshall Islands, Nauru, New Caledonia, New Zealand, Niue, Northern Mariana Islands, Palau, Papua New Guinea, Pitcairn Islands, Samoa, Solomon Islands, Tokelau, Tonga, Tuvalu, United States of America, Vanuatu and Wallis and Futuna. The SPC, as an organisation, assists the States of the Pacific region by delivering a wide range of technical, research, educational and planning services. The SPC headquarters are in Noumea, New Caledonia.



*Admiral MARATOS signs the MoU on behalf of IHO; meanwhile Dr. Jimmie RODGERS, Director-General of SPC signs on behalf of SPC, in the company of Dr. Russell HOWARTH, Director of SOPAC*

Establishing closer ties with the SPC has been a goal of the South West Pacific Hydrographic Commission (SWPHC) for some time. The MoU between the two inter-governmental organisations describes the aims, roles and mechanisms for improving regional hydrographic capability. It has already helped to raise the levels of awareness of the importance of hydrography and nautical charting among the SPC Member State governments. The MoU provides a single, high-level point of reference for the practical initiatives that both the IHO and the associated SWPHC will undertake in the future. This includes training and capacity building in the region, and notably establishing an improved hydrographic surveying capability in SPC's own Applied Geoscience and Technology Division (SOPAC). This could then be deployed throughout the region assisting those States with little or no hydrographic surveying capacity of their own.



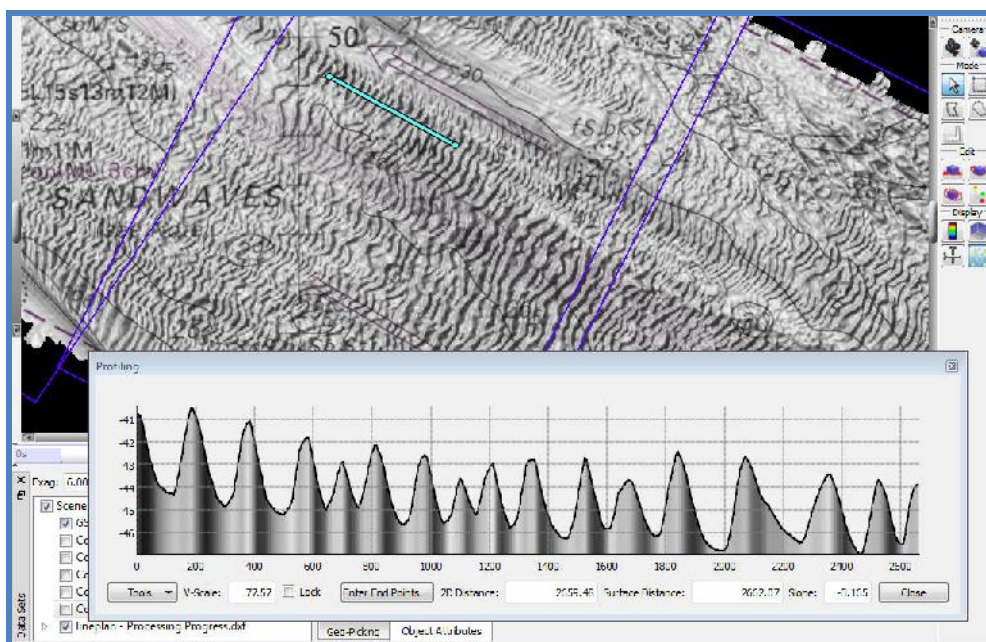
## STRAITS OF MALACCA AND SINGAPORE MARINE ELECTRONIC HIGHWAY

Environmental Data Feed Workshop  
Singapore, 30 May to 3 June 2011

A workshop on the provision and distribution of environmental data was held in Singapore at the end of May as part of the Marine Electronic Highway (MEH) Demonstration Project.

The MEH Project is being funded by the Global Environment Facility (GEF) and the International Bank for Reconstruction and Development (IBRD) and is supported by the International Maritime Organization (IMO) as manager of the Project. Additional financial support has been provided by the Republic of Korea – particularly for the provision of the shore side IT equipment and necessary software development. The three littoral States - Indonesia, Malaysia and Singapore, are all providing practical support and input to ensure the successful implementation of the Project with significant involvement from their Hydrographic Offices together with the Departments of Marine and other environmental agencies. The IHB, represented by Captain Ward, has participated throughout the Project providing technical advice, particularly in relation to hydrographic and nautical charting standards.

The purpose of the Project is to improve safety of shipping and protection of the marine environment by making digital environmental information available in real-time. This will include important information such as the observed height of tide, state of the tidal stream, and wave height information. Later, the Project will include the modelling and prediction of sandwave movement and a hydrodynamic model of the Straits to support predictions for any oil spill pollution incidents that might occur. Mariners transiting the Straits of Malacca and Singapore and shore-based agencies, interested parties and the general public will all have access to this information.



*Sandwave Area Surveys in the Straits of Malacca*

A comprehensive hydrographic survey of some of the most critical sandwave areas in the Malacca Strait was conducted earlier in the Project using multibeam echo sounders and side scan sonar. In addition, the Project has provided training and additional production software to the three littoral States to assist them with the production of Electronic Navigational Charts (ENCs) of the area.

The MEH Project has now reached another important stage, with the establishment of a data control centre, hosted by Indonesia in a custom-equipped facility in Batam, and the final preparations for system testing and acceptance before a live data service begins later in the year.

The main activity of the Environmental Data Feed workshop, hosted by Singapore, was to finalise details on the availability of environmental data and how the data will be formatted, collated, and portrayed. The MEH Project will be using Marine Information Overlays (MIO's) based on the IHO S-57 data standard as the method of providing its data to users. Advice will be sought from the relevant IHO Working Groups such as TSMAD, SNPWG and CSPCWG, on how best to create those MIO's and any extensions required to S-57. The Project members will also be making use of the earlier work of the IHO-IEC Harmonization Group on MIO's (HGMIO) that established the IHO's generic MIO Product Specification. They will also refer to the environmental MIO's including coral reef information and Marine Protected Areas that have already been created in other parts of the World.

The next phase of the Project will provide a real-time continuous broadcast of environmental information to ships and shore based authorities. This will mean that for the first time in the Straits of Malacca and Singapore, which is one of the busiest sea lanes in the World, vital environmental information will be available in real-time on the bridges of ships in an easy and intuitive map display format. In the beginning, the information will be provided via an internet portal, but in the longer term, after a permanent service is established, it should become an integral part of the emerging e-Navigation concept. Once the service is activated, vessels will be able to log-on when they enter the Straits and view a continuous stream of up to date environmental information – all free of charge. Most of the data will be presented as MIO's superimposed on the ENC's of the area.

The formal handover of the Data Coordination Centre in Batam and the start of a live data service will take place in the third quarter of 2011.

## O B I T U A R I E S

### **Mr. Rachid SEMLALI (1962-2010)**

IHB General Services Assistant / Office Manager (1987-2010)



The Directing Committee and staff of the IHB had the immense sorrow to announce, by way of CL 41/2010, Rachid SEMLALI's sudden death on 1st July 2010 at the age of 48 years following a short illness. Rachid had joined the IHB in 1987 as a General Services Assistant and later was appointed Office Manager. He will be well remembered by the many Member State delegates who have attended meetings at the Bureau, as well as the five-yearly Conferences, where Rachid was always present to ensure the proper functioning of all the technical requirements and the provision of logistical support to social events.

A memorial service was held in Monaco and his funeral took place in Rabat, Morocco, in the presence of his close family.

### **Mr. Bernard LAHIRE (1933-2011)**

IHB Office Manager (1968-1998)

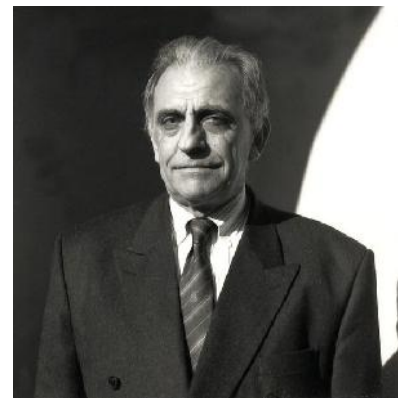
The Directing Committee and staff of the IHB are very sad to announce the death of Mr. Bernard LAHIRE on 6 January 2011, who had just celebrated his 77th birthday.

He joined the IHB in 1968 after having served in the French Navy as a Petty Officer and worked for 30 years for the Organization as Office Manager, serving under several Directing Committees with devotion and integrity.

The Member States' delegates will remember his role in the organization of the International Hydrographic Conferences and the receptions which were held alongside the conference, as well as his active participation in revising regulations for inclusion in the IHB Staff Regulations, at the 10<sup>th</sup> International Hydrographic Conference in 1972.

He also supervised the technical installations in the building on Quai Kennedy as well as the fitting out of the new premises on Quai Antoine 1<sup>er</sup> provided to the IHB as from the summer of 1996.

Mr. LAHIRE's funeral was held on Friday 14 January 2011 in the presence of close family and friends.



**Commander N.N. SATHAYE (1930-2011)**  
IHB Professional Assistant (Editorial) (1979-1986)



The Directing Committee and staff of the IHB were sad to learn of the death of Commander N.N. SATHAYE, at the age of 80, on 27 January 2011 in India surrounded by his family.

Commander SATHAYE, or “Nana” as he was known by many, joined the IHB in 1979, after having held the post of Hydrographer of Singapore, as the Professional Assistant (Editorial). He remained in this post until 1986. During his time at the Bureau he was in charge, amongst other things, of the IHO publications and, in particular, was responsible for the International Hydrographic Review which was published twice-yearly in English and in French at that time.

After leaving the IHB, Commander SATHAYE returned to live in India with his wife and daughters where he undertook consultancy work for a number of years. He was a devoted father and grandfather and made annual visits with his wife to New York to spend time with his two daughters and their families.

**Vice Admiral A. DOS SANTOS FRANCO (1913 – 2011)**

Vice Admiral Alberto DOS SANTOS FRANCO was born in the State of Rio de Janeiro, Brazil, on 5<sup>th</sup> December 1913.

In 1933, he was promoted to Midshipman and, after a successful naval career, was promoted to Rear Admiral in 1961.

He graduated from the Naval Academy with a Bachelor’s Degree in Naval Sciences, and completed the Course of Hydrography and Navigation for Officers at the Brazilian Directorate of Hydrography and Navigation (DHN) in 1937.

He served on a number of Brazilian ships, and was in command of hydrographic surveying ships, as well as Chief of Commission of many hydrographic surveys. During the war years 1944-1945, he served as Executive Officer on the warships - Corvette *Cabedelo* and the Destroyer *Beberibe*.

His shore service embraced a range of high level posts, faculty, and advisory activities, including a term as an IHB Director from 1962 to 1967.

Upon his return to Brazil, he was appointed Coordinator of the former Brazilian National Space Activities Commission, and in 1970 he was nominated Director of the Oceanographic Institute of the University of São Paulo (IOUSP). From 1974 to 2009 he worked as an advisor to various institutions on projects related to tides, which included the concept and production of software on tide prediction.

Admiral SANTOS FRANCO was the author of innumerable articles, papers and books on hydrography and oceanography, mainly concerning tides, and was recognized as an international reference on the subject.



He was awarded a number of decorations amongst which the Conrado Wessel Foundation Award in Applied Sciences to Water and a World War II Medal.

Admiral SANTOS FRANCO died in the city of São Paulo, Brazil on 3<sup>rd</sup> May 2011.