

19TH MEETING OF THE MESO AMERICA – CARIBBEAN SEA HYDROGRAPHIC COMMISSION (MACHC19)

Cartagena de Indias, Colombia, 28 November – 1 December 2018

NATIONAL REPORTS FROM BRAZIL TO THE MACHC19

Reference: IHO Resolution 2/1997 as amended

Executive summary

1. Hydrographic Office / Service:

a) Name of the institution: Directorate of Hydrography and Navigation (DHN).

b) Description: DHN is responsible for hydrographic surveys and its analysis, nautical chart production, nautical publication release, weather forecast broadcast, maritime safety information and navigational warning broadcast, oceanographic data analysis, hydrographic training and capacity building implementation.

c) Submitted by: LCdr. (Engineer) Ricardo Ramos Freire, ricardo.freire@marinha.mil.br .

2. Surveys:

a) Coverage of new surveys: during 2018, the Brazilian Navy Hydrographic Vessels carried out surveys in the Amazon Basin, mainly in the Madeira, Solimões and Amazon rivers and in the northern region of NAVAREA V, contributing to the nautical cartography production of the area.

b) New technologies and /or equipment: no new technologies nor equipment have been used.

c) New ships: Brazilian Navy Ship AvPqHo “Aspirante Moura”.

d) Problems encountered: no problems to report.

3. New charts & updates:

a) ENCs

BR404412 - Da Foz do Rio Trombetas ao Lago Paru

BR404211 - Da Foz do Rio Jari à Ilha Xavier

b) ENC Distribution method: Brazilian ENCs are distributed by IC-ENC. In 2018, the Brazilian company EMGEPRON began working as reseller of VAR PRIMAR (<https://cartasnauticasbrasil.com.br/>).

c) RNCs

DHN provides Raster Navigational Charts for NAVAREA V. 513 RNC (77 in MACHC region) are currently available at no cost for the entire community (<https://www.marinha.mil.br/chm/dados-do-segnav/cartas-raster>).

d) INT charts:

- 407 - Northeast Coast of South America - Costa Nordeste da América do Sul
- 4196 - Do Cabo Norte ao Cabo Maguari
- 4197 - Do Cabo Maguari à Ponta Boíuçucanga

e) National paper charts

- 4025 - Das Ilhas do Caldeirão ao Paraná do Ramos
- 4024 - Da Ilha de Santa Rita às Ilhas do Caldeirão
- 4023 - De Óbidos à Ilha de Santa Rita
- 4023A - Paraná de Santa Rita
- 4022 - Da Ilha do Patacho à Ilha do Amador
- 4215 - De Porto Alegre à Ilha Marapi
- 4753 - Do Porto de Amparo a Porto Velho

f) Problems encountered

DHN is facing a new challenge: decentralize cartographic production by using Navy local hydrographic branches to conduct surveys, analyse hydrographic data, load and validate bathymetric and cartographic databases and produce nautical charts, aiming at timeless update (ping-to-chart). In order to achieve this goal, some difficulties need to be overcome: capacity building, database connection between DHN and other branches (Distance to the Amazon region branches; 1,500 km up to 3,000 km) and Inland ENC production.

4. New publications & updates:

- a) New Publications: Sailing Directions - North Coast DH1-I 12th Edition (December 2018).
- b) Updated publications: Tide Tables DG6 56th Edition (November 2018) and Nautical Almanac DN5 75th Edition (October 2018).

c) Means of delivery: accessible through paper format (EMGEPRON's website - <https://cartasnauticasbrasil.com.br/>) and digital format (DHN's website - <https://www.marinha.mil.br/chm/dados-do-segnav/publicacoes>).

d) Problems encountered: XXX

5. MSI

a) Existing infrastructure for transmission: Brazilian Navy Hydrographic Centre is responsible for the reception, processing and promulgation of MSI for NAVAREA V, on behalf of DHN, in accordance with GMDSS Master Plan. Navigational warnings and meteorological information are broadcast by SafetyNET service at scheduled times (0030 and 1230 UTC) twice a day. Meteorological information is broadcast at scheduled times (0730 and 1930 UTC) twice a day. Bad weather warnings are forwarded any time, whenever it's necessary. MSI is also broadcast in VHF/HF by the Brazilian Navy Radio Station in Rio de Janeiro, at least twice a day. Local navigational warnings are broadcast only by VHF/HF.

SERVICE	YES	NO	PARTIAL	NOTES
LOCAL WARNINGS	X			
COASTAL WARNINGS	X			
NAVAREA WARNINGS	X			
INFORMATION ON PORTS AND HARBOURS	X			

b) New infrastructure in accordance with GMDSS Master Plan

SERVICE	YES	NO	PARTIAL	NOTES
MASTER PLAN	X			
A1 AREA	X			
A2 AREA	X			
A3 AREA	X			
NAVTEX		X		
SafetyNET	X			

c) Problems encountered: XXX

6. C-55

C-55 Region B was subdivided in 3 regions: Amazon Basin, Brazilian Coast, and São Pedro and São Paulo Archipelago.

Status of hydrographic survey:

Survey coverage, where:

A - Percentage which is adequately surveyed.

B - Percentage which requires re-survey at larger scale or to modern standards.

C - Percentage EEZ which has never been systematically surveyed.

1 - Amazon Basin

	A	B	C
0 - 200m	70	30	0
Depths > 200m	---	---	---

2 - Brazilian Coast

	A	B	C
0 - 200m	70	20	10
Depths > 200m	100	0	0

3 - São Pedro and São Paulo Archipelago

	A	B	C
0 - 200m	0	100	0
Depths > 200m	100	0	0

Status of nautical charting:

Coverage of charts published by your organization, where:

A - Percentage covered by INT series/paper chart series meeting the standards in S-4.

B - Percentage covered by Raster Navigational Charts (RNCs) meeting the standards in S-61.

C - Percentage covered by ENC's meeting the standards in S-57.

1 - Amazon Basin

Chart coverage	Passage (%)	Coastal (%)	Port (%)
INT	---	---	---
RNC	---	---	100
ENC	---	---	100
Status of Paper Charts			
Paper charts with depths in meters (%)	100		
Paper charts referenced to a satellite datum (%)	89		

2 - Brazilian Coast

Chart coverage	Passage (%)	Coastal (%)	Port (%)
INT	100	100	100
RNC	100	100	100
ENC	100	100	100
Status of Paper Charts			
Paper charts with depths in meters (%)	100		
Paper charts referenced to a satellite datum (%)	100		

3 - São Pedro and São Paulo Archipelago

Chart coverage	Passage (%)	Coastal (%)	Port (%)
INT	100	100	---
RNC	100	100	---
ENC	100	100	---
Status of Paper Charts			
Paper charts with depths in meters (%)	100		
Paper charts referenced to a satellite datum (%)	100		

7. Capacity Building Offer of and/or demand for Capacity Building

a) Training received: XXX

b) Training needed, offered:

COURSE	DESCRIPTION	DURATION
C-Esp-HN	Aims to qualify the student to be a technician in Hydrography and Navigation issues.	42 weeks
C-Ap-HN (IHO Cat. "B")	Aims to increase the capability of the student as a technician in Hydrography and Navigation.	35 weeks
CAHO (IHO Cat. "A")	Aims to provide the student with the capability to plan, to conduct and to execute the activities related with the Hydrographic Office.	50 weeks

On October 2018, DHN hosted, within SWAtHC CB Work Program, a Maritime Safety Information (MSI) Workshop. Despite the initial offer of one vacancy for MACHC, it was possible to register 4 (four) requests received.

A total of 18 (eighteen) participants from 12 (twelve) different countries attended: Brazil (6) Argentina (2), Uruguay (1), Bolivia (1), Peru (1), Ecuador (1), Venezuela (1), El Salvador (1), Guyana (1), Paraguay (1), Liberia (1) and Colombia (1).

In 2018, an Officer from the Bolivian Navy is attending the Cat. "A" Hydrographic Training Course (CAHO) offered by DHN.

In 2019, DHN expects to receive up to 12 representatives from Angola (6 TBC), Mozambique (4 TBC) and Saint Vincent and the Grenadines (2 Confirmed) for the Cat. "A" Hydrography Training Course (CAHO) and the Cat. "B" Hydrography Training Course (C-Ap-HN). The Bolivian and the Colombian Navies recently expressed interest in sending Officers to attend CAHO in 2019.

8. Oceanographic activities

a) General: deployment of XBTs by Brazilian Navy Ships in international waters and maintenance of 8 (eight) moored buoys of the PIRATA Moored Array Project by Brazilian Navy Survey Ships.

b) GEBCO/IBC's activities: GEBCO soundings are performed by the Brazilian Navy Survey Ships during all hydrographic and oceanographic surveys.

c) Tide gauge network: 431 tide gauges are distributed throughout the Brazilian territory (October 2018). 43 tide gauges are placed in the MACHC region.

d) River gauge network: 52 river gauges are placed in the MACHC region.

e) New equipment: XXX

f) Problems encountered: XXX

9. Other activities

a) Participation in IHO Council / Commissions / Committees / Sub-Committees / Working Groups: IHO Council, MACHC, SWAtHC, HCA, HSSC, IRCC, S-100WG, ENCWG, NCWG, NIPWG, DQWG, MSDIWG, TWCWG, CBSC, WENDWG, IBSC, GEBCO-SCUNF, WWNWS-SC, CSBWG, ABLOS, IEHG, NCSR and IC-ENC Steering Committee.

b) Meteorological data collection: meteorological data are collected by fixed meteorological stations placed all over Brazil, by ships and are also received from other institutions through internet links. All data are used for the Marine Meteorological Service products, broadcast at no cost along and offshore the Brazilian coast and by internet.

c) There is a massive effort to analyze hydrographic data and load cartographic database. Highly dynamic riverine environments demand time series analysis which will define survey areas priorities.

d) S-100 subjects, same people that analyze data and produce charts must study multiple publications, which impacts on cartographic production.

e) MSDI Progress:

i. Technical Progress: Production and test environments under development to support MSDI-DHN. Analysing open source solutions (Geonetwork, Geoserver), private company products (Caris Spatial Fusion Server and Viewer), as well as combining both resources to get the most adherent workflow to DHN needs. It was also created a web form tool to automatically load structured metadata;

ii. Policy and Governance: Data Access Policy (NAD-DHN) approved and issued.

10. Main achievements during the year

a) DHN released a shallow water current prediction system which extrapolates current velocities and directions in shallow waters from the astronomical tides. The first version is constrained to the Guanabara Bay, in Rio de Janeiro (<https://www.marinha.mil.br/chm/dados-do-smm/corrente-de-mare>).

b) Until November, the IC-ENC Latin America Regional Office located at DHN, on its second year of activities, has conducted 1,260 ENC validations from 25 MS^{*1} from the IC-ENC. 785 ENCs from these validations were produced by MACHC MS. On the past two and a half years DHN has validated about 2,500 cells from almost all of the 42 IC-ENC MS. The team is composed by one Engineer Officer and two Enlisted. They all received specific training from IC-ENC to conduct their activities.

c) DHN approved a new Data Access Policy (NAD-DHN) to regulate about data publicly accessible on DHN's website (<https://www.marinha.mil.br/dhn/?q=pt-br/nad>). Metadata catalogue is produced using XML format files based on ISO 19115/19139. It will also be used to populate the Brazilian National Spatial Data Infrastructure (INDE).

d) DHN is releasing new nautical charts of Madeira River. By the end of 2018, 24 paper charts and respective raster charts will be issued, as well as the associated 11 Inland ENCs. The goal is to have all Madeira River (between Porto Velho and Itacoatiara) covered by the end of 2019, which will comply 43 paper charts and respective raster charts, as well as 23 Inland ENCs. All data are being processed by a cartographic production database.

¹ 25 IC-ENC MS - Argentina, Australia, Belgium, Brazil, Colombia, Cuba, Denmark, Ecuador, Germany, Greece, Iceland, Italy, Mexico, Netherlands, Panama, Peru, Portugal, Russia, South Africa, Spain, Suriname, Turkey, United Kingdom, United States, Uruguay, Venezuela.

e) DHN maintains 143 raster charts of the Paraguay River on its website (<https://www.marinha.mil.br/chm/dados-do-segnav/cartas-raster>), covering approximately 2,200 km. Recently, DHN released, free of charge, 25 Inland ENC's regarding Brazilian waterway portion and 11 for Paraguayan waters (<https://www.marinha.mil.br/chm/dados-do-segnav/cartas-ienc>). All those Inland ENC's are maintained using CARIS Hydrographic Production Database.

11. Conclusions: DHN reassures its commitment with MACHC and plans continuous hydrographic activities so as to keep its nautical charts updated, as stated in regulations V and IX of the SOLAS Convention.