



PORTUGAL NATIONAL REPORT

To the

13th Meeting of the

Eastern Atlantic Hydrographic Commission

Casablanca, Morocco

16th – 18th September 2014

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INTRODUCTION

This report describes the main technical activities and developments at the Portuguese Hydrographic Institute (IHPT) during the period from November 2012 to September 2014. It was elaborated in order to be presented at the 13th Conference of the EAtHC, and covers the following areas: Hydrography, Cartography, Information Technologies and GIS, safety of navigation and Technical Assistance and Training.

1- HYDROGRAPHIC OFFICE

The most relevant information is presented in Annex A.

Since 30th of June IHPT has a new Director-general, Rear-admiral José Luís Branco Seabra de Melo.

2- SURVEYS

Hydrographic surveys within IHPT are carried out mainly with multibeam systems but singlebeam echosounders are still in use. Positioning is obtained using GPS (Differential or RTK/OTF mode).

The oceanic hydrographic ships NRP “D. Carlos I” and NRP “Almirante Gago Coutinho” (see figure 1), are very well equipped for hydrographic surveys. Each one has a multibeam echosounder system for deep waters (KONGSBERG EM 120) and NRP “Almirante Gago Coutinho” also has a multibeam system for medium depths (KONGSBERG EM 710). To complement its survey capacities, each ship may carry a small survey launch with a multibeam echosounder for shallow waters.



Figure 1 – Hydrographic ship NRP “D. Carlos I”.

At the end of 2013 IHPT modernized and increased its capacity to perform hydrographic surveys in shallow waters with a full seafloor search. To complement the two multibeam systems KONGSBERG EM 3002, two new systems were acquired, one multibeam system KONGSBERG EM2040C and one bathymetric sonar KONGSBERG GeoSwath 500 Plus.

To improve the quality of the bathymetric data, IHPT also acquired an MVP UnderwaySV of the OceanScience (see figure 2). This system allows the acquisition of sound velocity profiles almost continuously and consequently reduces the time interval between consecutive profiles, which will result in an improvement of the bathymetric data quality.

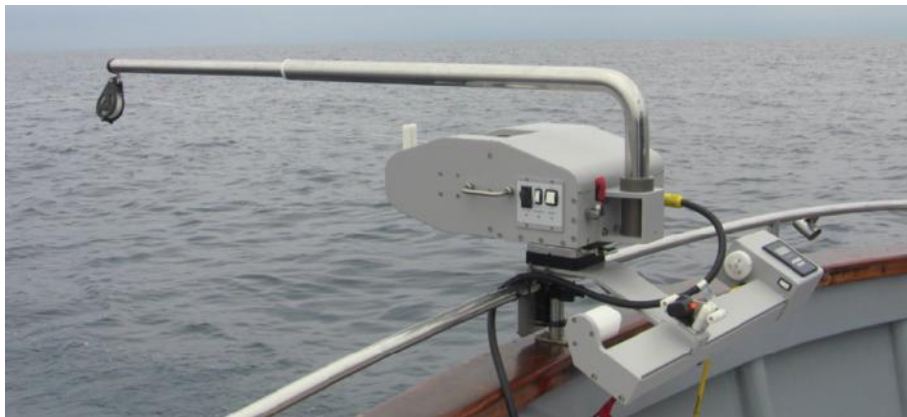


Figure 2 – Moving Vessel Profiler.

There was also an investment in the analysis of the water column acoustic reflectivity, with the acquisition of a software license to record these data obtained by our multibeam systems (see figure 3).

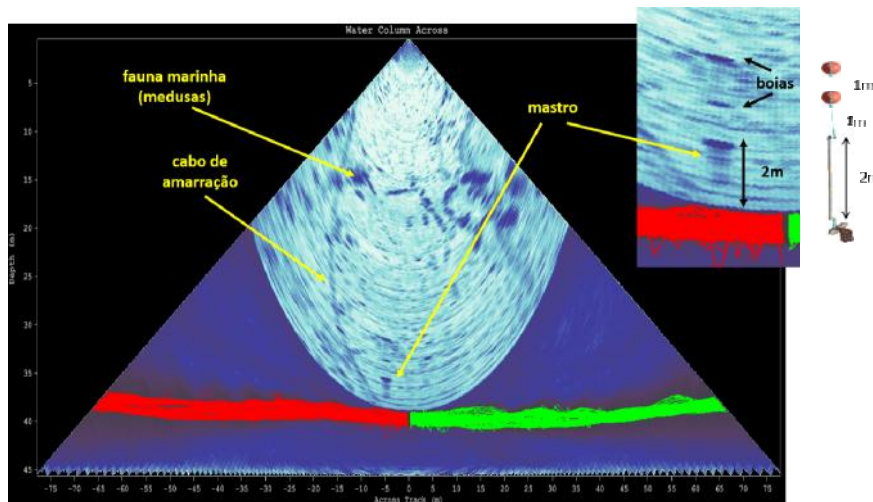


Figure 3 – Water column acoustic reflectivity from an anchored array.

Special attention continues to be paid to the development of procedures for Quality Assurance (QA) and Quality Control (QC) of hydrographic data.

Due to the limitations of the previous bathymetric database, the Hydrographic Data Warehouse (HDW), IHPT has recently purchased the BathyDatabase from CARIS.

In the last two years, most of the hydrographic surveys have been focused on the Portuguese coast. During that period, seventeen hydrographic surveys were executed in harbours and their approaches (see figure 4 and 5), such as: Guadiana river, Póvoa de Varzim, Vila do Conde, Douro, Leixões, six in Lisbon harbour (Passo da Barra Sul, Doca da Marinha, Baía do Seixal, BNL, canal CUF e Terminal Sólidos Barreiro e Canal da Siderurgia), Sesimbra, Portimão, and four in Madeira Archipelago (Funchal, Caniçal, Quinta do Lorde and Parque Natural do Garajau).



Figure 4 – Hydrographic Surveys realized in Portugal Continental.

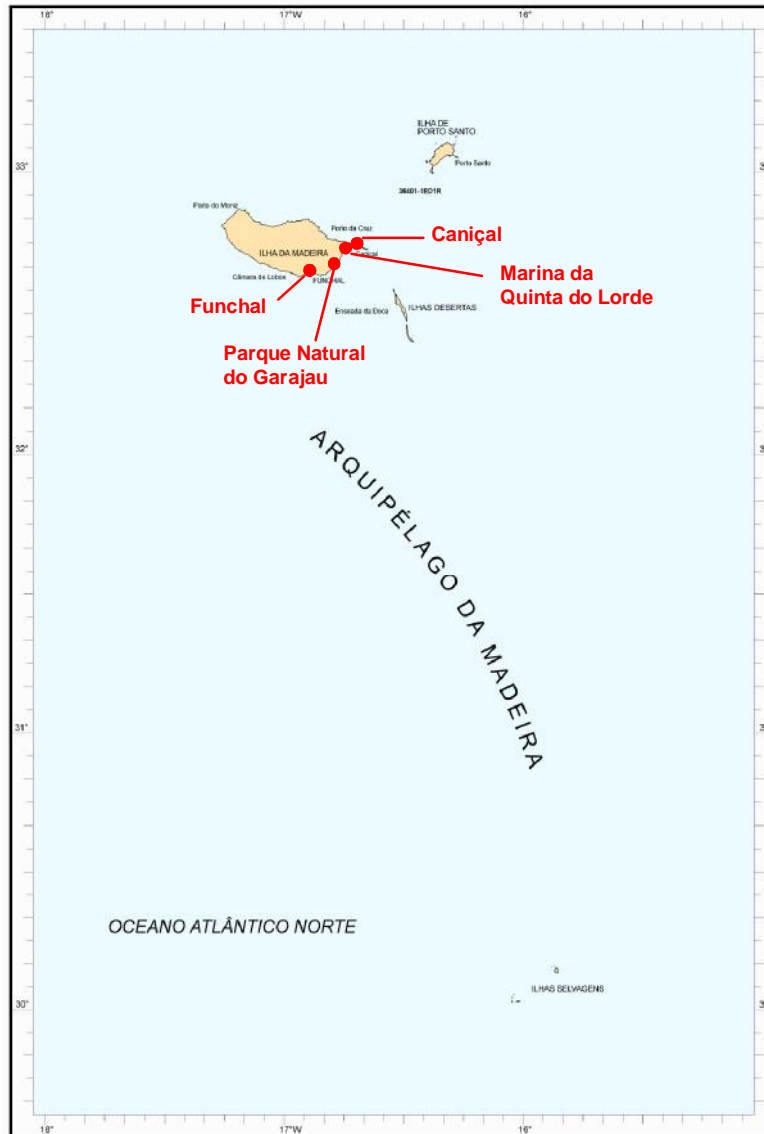


Figure 5 – Hydrographic Surveys realized in Madeira Archipelago.

Both oceanic hydrographic ships “D. Carlos I” and “Almirante Gago Coutinho” were employed on surveys for the project of the Extension of the Portuguese Continental Shelf and on other projects related with the environmental studies, geophysics and dynamic characterization and coastal protection. In those surveys, hydrographic and topographic integrated methods were used and, in some cases, seismic geological methods and sediment and water chemical analysis were included.

3- NEW CHARTS AND UPDATES

IHPT continues the implementation of CARIS – Hydrographic Production Database (HPD) as the unique cartographic production system.

In addition to the Nautical Charts and the Electronic Navigational Charts, some special purposes charts are also produced, for instance: charts for fishermen, charts for recreational boating, sedimentological charts and special charts for training purposes. All those charts are in accordance with IHO specifications and were very well accepted by the users.

Paper Charts

Since the last EAHC meeting, IHPT published one new chart (in blue), 5 new editions (in red) and 5 revised reprints (in green), depicted in the figures 6, 7 and 8, within the areas of the Commission.

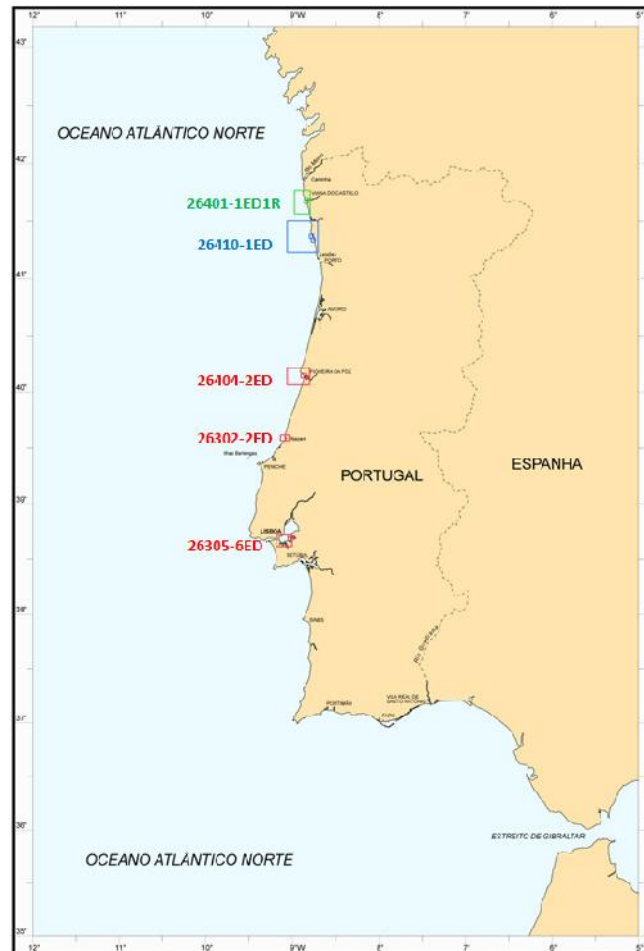


Figure 6 – New editions in Portugal Continental.

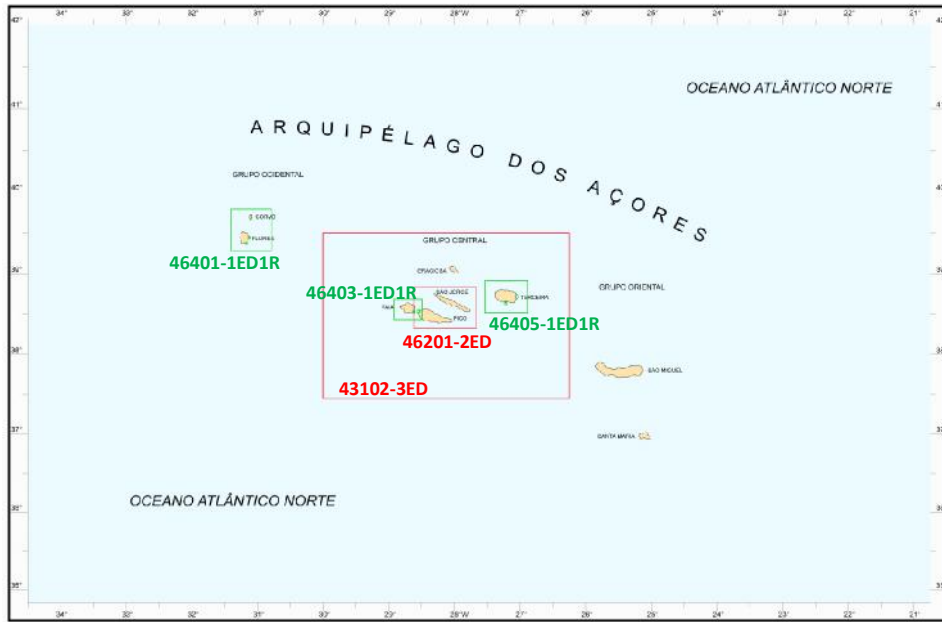


Figure 7 – New editions in Azores Archipelago.

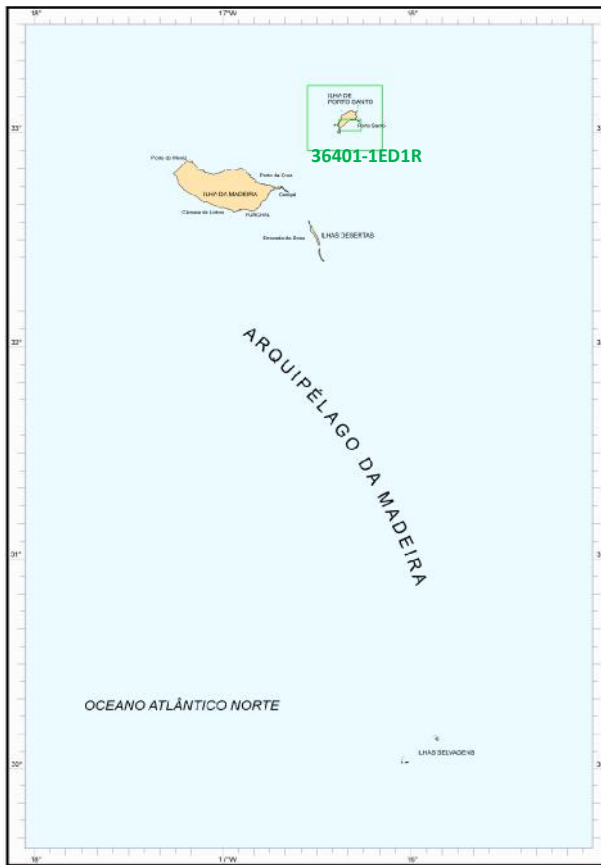


Figure 8 – New editions in Madeira Archipelago.

All the IHPT new charts and new editions are bilingual (Portuguese and English) and follow the INT specifications, whether or not they belong to the INT series. A list of the paper charts produced by the IHPT since OUT 2012 is presented in Annex B.

Print on Demand (PoD).

Presently IHPT provides 100% of the national Nautical Charts using a PoD system.

PoD charts are continuously updated according to the published “Notices to Mariners”.

Electronic Navigational Charts (ENCs).

IHPT ENC cells format is S-57/Edition 3.1. Each ENC is broadly equivalent to a paper chart both in terms of area and content.

IHPT is a member and participates actively in the works of the International Centre for ENCs (IC-ENC), including their Technical Experts Working Groups. Presently, 74 Portuguese ENC cells are available for distribution through IC-ENC, covering all the oceanic and coastal waters of Portugal, as well as the main harbours and their approaches.

In 2010, IHPT completed the entire folio of 74 ENCs that can be classified according to the following navigational purposes:

NP1 Overview	NP2 General	NP3 Coastal	NP4 Approaches	NP5 Harbour
1	3	11	18	41

Furthermore, Portugal has completed 13 ENCs of the folio in the area of Cape Verde, classified according to the following navigational purposes:

NP2 General	NP5 Harbour
1	12

Since the last meeting, 3 new ENC's (in blue) were produced, and 13 new editions (in red) represented in the following figures.

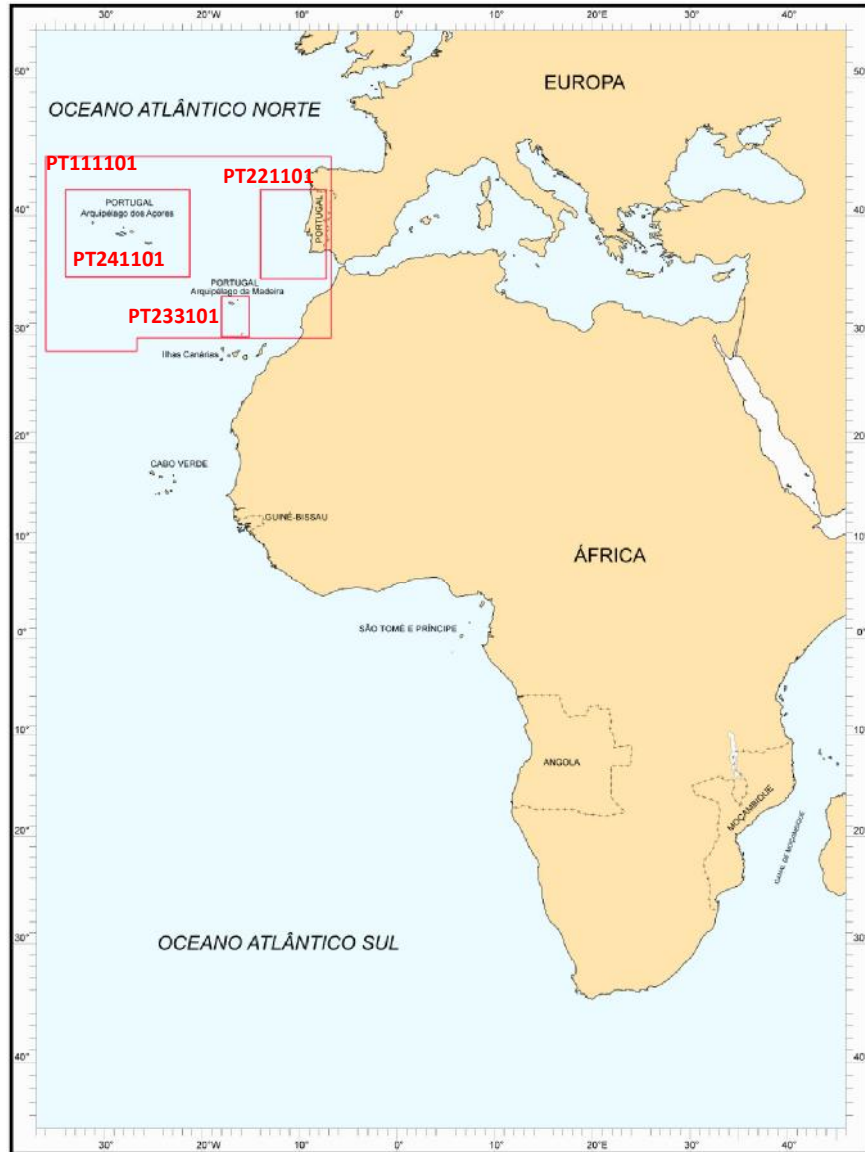


Figure 9 - New ENC editions in Portugal.

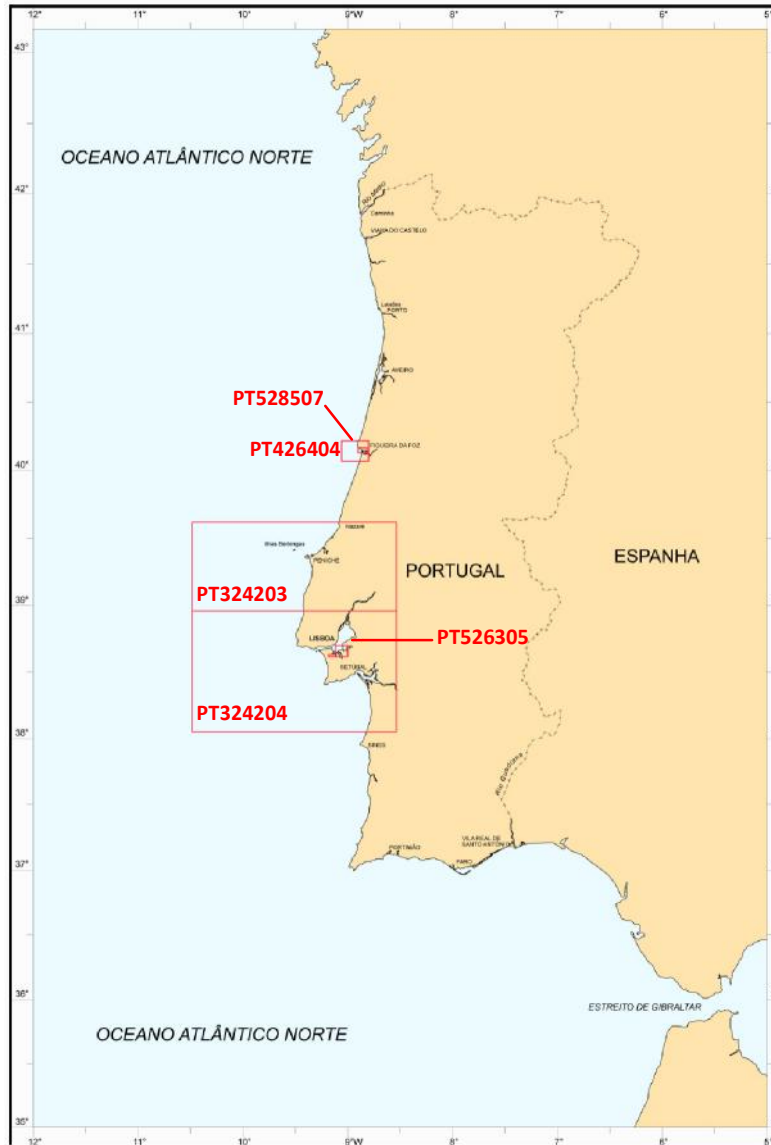


Figure 10 - New ENC editions in Portugal Continental.

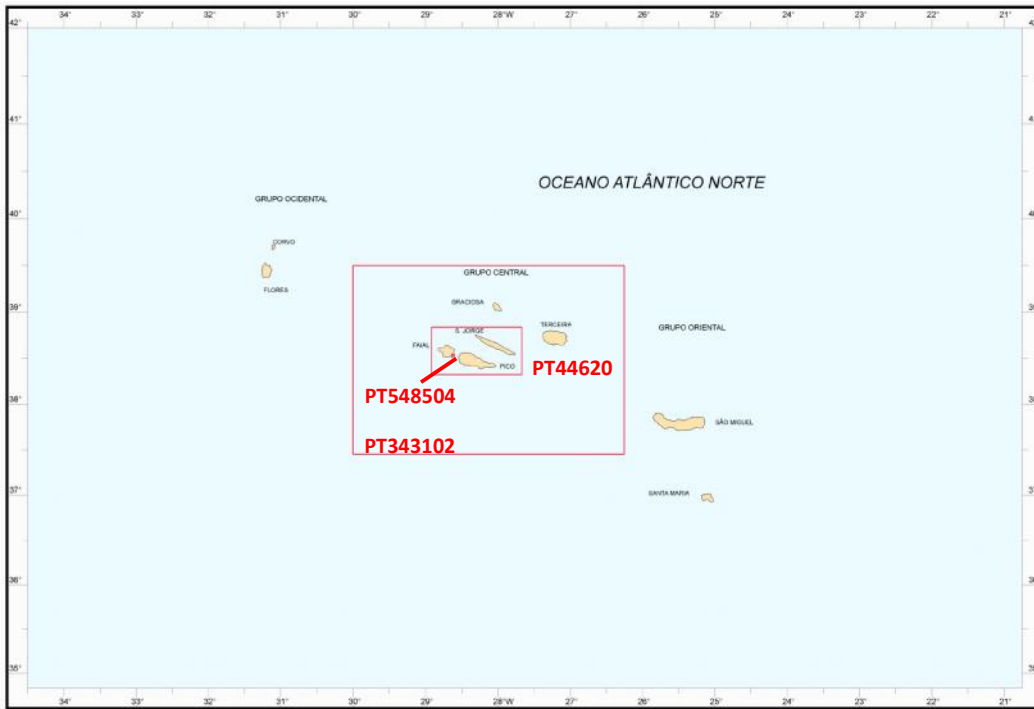


Figure 11 – New ENC editions in Azores Archipelago.

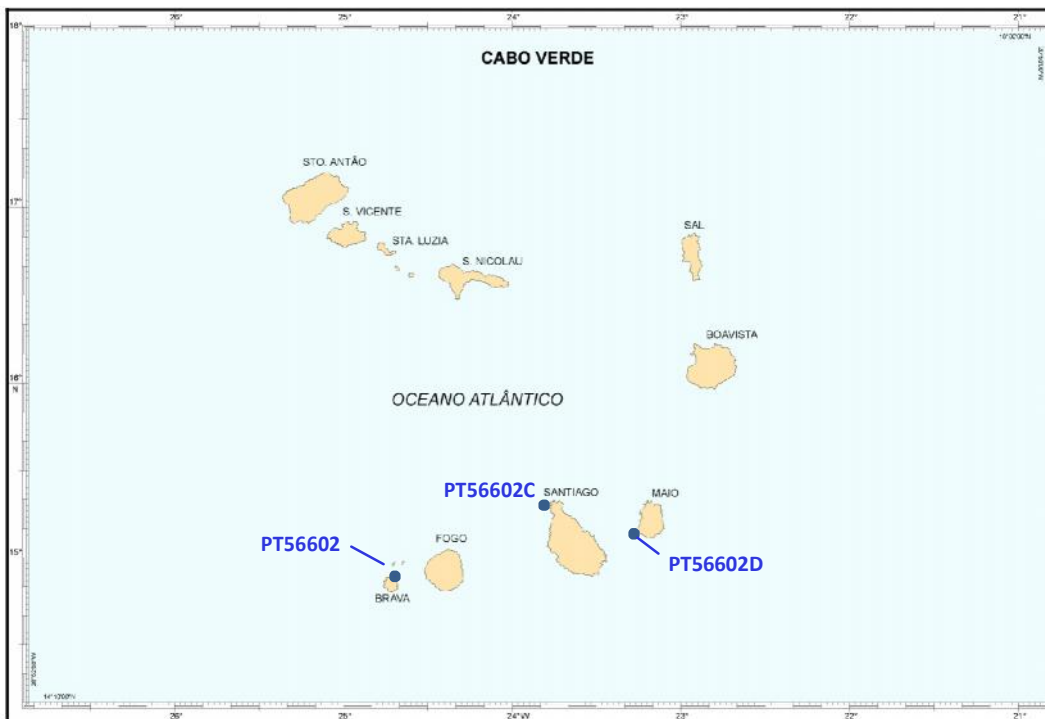


Figure 12 - New ENC editions in Cape Verde Archipelago.

A list of the ENC cells produced by IHPT during the report's period is presented in Annex B.

4- NEW PUBLICATIONS AND UPDATES

Since November of 2012, IHPT published the following nautical publications:

- Annual Group of Notices to Mariners (2013);
- Annual Group of Notices to Mariners (2014);
- List of Lights, Buoys, Beacons and Fog Signals – Portugal Volume I - 10th edition (2013);
- List of RadioBeacons and Services – Volume I – 6nd edition (2013);
- Maritime Buoyage System and other Aids to Navigation – 3rd edition (2013);
- Nautical Communications Table – 1st edition (2013);
- Maritime Buoyage System Table – 1st edition (2013);
- Weather Chart (North Atlantic / North Sea / Western Mediterranean - 1st edition (2013);
- Weather Chart (North Atlantic / Western Mediterranean - 1st edition (2013).

Annually, the IHPT also publishes the Tide Tables for the main harbours of Continental Portugal and the Azores and Madeira Archipelagos. During the last years some of the tidal constituents continued to be recalculated using more recent tidal observations.

IHPT also publishes annually the Tide Tables for the African Portuguese Speaking Countries which, in the EAthC, region includes the main harbours of Cape Verde, Guinea-Bissau and Sao Tome and Principe.

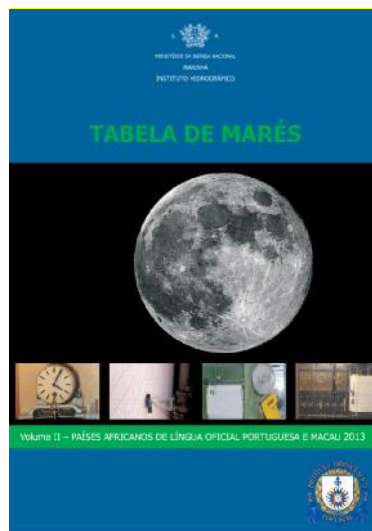


Figure 13 – Tide table for African Portuguese Speaking Countries.

5- MARTIME SAFETY INFORMATION

Until October 2012, IHPT, as the national coordinator for the Maritime Safety Information, provided a 24h service of Navigational Warnings, in cooperation with the NAVAREA II coordinator. Since that date, this service is provided by the Maritime Operations Centre of the Portuguese Navy (COMAR), remaining IHPT the National Coordinator.

NAVTEX broadcast is made both in English and Portuguese and it is transmitted from the Maritime Communications Center (Lisboa), S. Miguel (Azores Archipelago) and Porto Santo (Madeira Archipelago) stations.

The GMDSS coverage is not completed yet, due to some delays on the establishment of the Digital Selective Call capability. Efforts are being made to cover all the Portuguese maritime territory.

Monthly IHPT publishes a Group of Notices to Mariners, containing all the permanent, temporary and preliminary warnings in force for the corresponding period. This information, covering all navigation charts and publications of Portugal, Angola, Cape Verde, Guiné and São Tomé e Príncipe, is also available on the web site.

IHPT built a friendly on-line application – ANAVNET, supported by robust and secure databases, capable of providing either entire NtM publications, or single NtM affecting individual documents; allowing in any case the consult and print, including entire correction pages of nautical publications and blocks to apply on nautical charts.

ANAVNET allows the consult of Navigational Warnings broadcasted by any of the Portuguese NAVTEX stations (coastal and local), both in Portuguese and English languages.

Regarding the Broadcast Stations (BS) from the national differential GPS network (DGPS), the Continental Portugal component consists of two DGPS BS, with redundancy and integrity monitoring, located at Cape Carvoeiro and Sagres. There are also two BS in the Portuguese Archipelagos: One in the Açores Archipelago (Horta station) and another one in Madeira Archipelago (Porto Santo station).

Portugal has also three AIS coastal stations in Continental Portugal and in Azores and Madeira Archipelagos.

6- C55

Updates to C55 are listed in Annex C.

7- CAPACITY BUILDING

IHPT continues to compute and publish annually the Tide Tables for the Portuguese Speaking African Countries, including, within the EAHC area, Cabo Verde, Guiné-Bissau and S. Tomé e Príncipe.

During the report's period, under the existing Cooperation Agreement Portugal – Cape Verde, IHPT produced three ENC's from Cape Verde.

It is expected that, in the near future, under the mentioned agreement, surveys will be conducted and produced new editions of the Nautical Charts and ENC's of the following harbours:

- Porto de Palmeira – Ilha do Sal;
- Porto de Porto Novo – Santo Antão;
- Porto de Vale de Cavaleiros – Ilha do Fogo;
- Porto da Furna – Ilha Brava.

In February of 2012 an IHPT officer integrated the IHO EAHC/CHAo team that conducted a Technical Visit to the Guiné-Bissau in the scope of the Capacity Building program.

The Portuguese Hydrographic Institute and the Hydrographic Office de la Marina – Spain (IHM) have been over recent years strengthen their relations.

This excellent relationship has been materialized, over the past two years, in a collaborative project that aims to intensify the collaboration between both, promoting the share of knowledge, methodologies, procedures and information, having in view a further development of the respective hydrographic capabilities conjugated with an optimization of resources.

Within this project two joint hydrographic surveys were performed, one involving small survey vessels (see figure 14) and another with hydrographic ships. Both institutions intend to continue and extend this collaboration to other areas, such as the cartographic production and operational oceanographic forecasting.



Figure 14 – Directors of IHPT and IHM in a survey launch.

8- OCEANOGRAPHIC ACTIVITIES

a. GEBCO/ IBCEA

The IBCEA Sheet 1.02 (Portugal - Archipelago of Madeira) still in the phase of bathymetric information compilation at the scale of 1:250000.

The compilation of IBCEA Sheet 1.07 (Cabo Verde) was not initiated yet.

b. Tide Gauge Network

The Portuguese tide gauge network consists of 22 tidal stations spread over continental Portugal, Açores and Madeira Archipelagos. Most of the stations belong to the IHPT which is in charge of the installation, maintenance and data collection (some with cooperation of harbour authorities). Cascais and Lagos stations are property of the Direção Geral do Território, although IHPT also collects and processes the data from these stations. The Portuguese tide gauge network has installed the following tide gauge technologies: radar (17 stations with VegaPuls and Krohne gauges), acoustic (3 stations with Next Generation Water Level Measurement Systems) and also pressure (from Druck and LevellTroll) and float and stilling well gauges (from A.OTT). Annex D depicts the Portuguese tide gauge network.

Portugal is a member of the Global Sea Level Observing System (GLOSS) contributing with seal level data from Cascais, Ponta Delgada, Lajes das Flores and Funchal. As a GLOSS member, mean sea level data is regularly sent to the Permanent Service for Mean Sea Level (PSMSL) based in Liverpool at the UK National Oceanography Centre.

Sea level data is stored in a database, "TIDE", which allows the storage of sea level heights, mean sea levels, tide predictions, harmonic constants and tidal levels, along with the corresponding metadata. Data from stations is directly sent to this database in near real time.

9- OTHER ACTIVITIES

a. Information technologies and GIS

Since 2009, IHPT has been publishing free access data for public download at his website. The available data includes physical oceanographic parameters and bathymetry. IHPT is also fulfilling the EU Inspire directive requirements by publishing some geodatasets, using the OGC formats, in some areas such as hydrography, altitude, geology and administrative boundaries.

IHPT has several portals at Internet and Intranet (hidrografico.pt) presenting information about its organization, main activities, products offered and specific geo-spatial on-line data.

In the last year an operational forecast system for sea state, called "Qual é a tua Onda?" was developed, depicting sea state forecasts and other generic information to the public. This information system covers all the Portuguese mainland coasts and several parts of the archipelagos. This system is available to the general public, on the IHPT web portal, organized into usability sectors, such as the surf community, recreational navigation and fisheries.

Notices to Mariners and Navigational Warnings issued by the IHPT are also available at IHPT Internet portal ANAVNet, as well as general information on the Portuguese Nautical Charts and Nautical Publications.

IHPT also supports IC-ENC by providing a world ENC availability catalogue (independent of maker or distributor) to support the mariners.

b. Courses in Hydrography

IHPT School of Hydrography and Oceanography provides Specialization Courses in Hydrography (FIG/IHO Category A and B). During the period of this report attended the courses the following students:

- 2012/2013 – Cat. B - 3 petty officers of the Portuguese Navy and 3 Portuguese civilians;
- 2013/2014 – Cat. A – 5 officers of the Portuguese Navy and 3 civilians, one Spanish (see figure 15). From March 11 to April 14 of 2014 a cartographer from Mozambique attended the Cartographic Projections and Nautical Cartography modules.
- 2014/2015 (about to start) - Cat. B - 3 petty officers of the Portuguese Navy and 1 Portuguese civilian. IHPT also expect 6 students from Angola and 2 from Morocco.



Figure 15 – IHPT School of Hydrography and Oceanography.

ANNEX A

HYDROGRAPHIC OFFICE GENERAL INFORMATION PORTUGAL (PORTUGUESE REPUBLIC)

INSTITUTO HIDROGRAFICO Rua das Trinas – 49 1249-093 LISBOA	
Department of which the Hydrographic Office is part <i>Ministère dont dépend le Service Hydrographique Ministerio del que depende el Servicio Hidrográfico</i>	Ministry of National Defense – Navy.
Principal functions of the H.O. - <i>Attributions principales du S.H. Principales funciones del S.H.</i>	Hydrographic Surveys, Paper and Electronic Nautical Charts, Sailing Directions, Lights and Radio Signals Lists, Notices to Mariners (monthly), Immediate Navigational Warnings, Tide Tables, Tidal Currents, Magnetic Compass Certification and Adjustment. Aids to Navigation Plans. DGPS, AIS projects. Oceanography. Provision of geophysical and environmental information for scientific and defence issues.
National day - Fête nationale – Fiesta nacional	10 June
Telephone : Fax : E-mails : WEB site:	+ 351 21 094 3000 + 351 21 094 3299 dirgeral@hidrografico.pt dirtecnica@hidrografico.pt hidrografia@hidrografico.pt http://www.hidrografico.pt
Date of establishment and Relevant National Legislation – <i>Date de fondation et législation nationale concernée – Fecha de establecimiento y Leyes nacionales dereferencia</i>	22 September 1960 • Territorial Sea: Law n° 34/2006 • Baseline: Laws n° 2130/66 and 495/85 • EEZ: Laws n° 34/2006, n° 119/78 and n° 52/85
Name and rank of the Director or Head - <i>Nom et grade du directeur – Apellidos y graduación del Director</i>	Rear-admiral José Luís Branco Seabra de Melo, Director General
Tonnage – Tonelaje	2011 = 1,334,011
Total Budget - Budget total – Presupuesto Total	8 million Euros
Staff employed - Effectifs – Plantilla	For details, consult the WEB site: http://www.hidrografico.pt
N° of charts published - Nombres de cartes publiées – <i>N° de cartas publicadas</i>	225
N° of INT charts published – Nombres de cartes INT publiées - N° de cartas INT publicadas. N° of ENC cells published – Nombres de cellules ENC publiées - N° de células ENC publicadas.	35 74
Type of publications produced (e.g. Tide Tables, Sailing Directions, List of Lights etc.) – Type de publications produites (par ex: Tables des marées, Instructions nautiques, Livres des Feux, etc. - Tipo de publicaciones producidas (por ej: Tablas de mareas, Derroteros, Libros de Faros etc.)	- Catalogue of Charts and Nautical Publications; - Catalogue of Nautical Charts of Portugal; - Tide Tables – Volume I – Portugal; - Tide Tables – Volume II – African Portuguese Speaking Countries; - List of Radio Aids and Services; - List of Lights – Volume I – Portugal; - List of Lights – Volume II – African Portuguese Speaking Countries; - Sailing Directions – Continental Portugal – Volumes I to III; - Sailing Directions – Azores Archipelago; - Sailing Directions – Madeira Archipelago;

	<ul style="list-style-type: none"> - Sailing Directions - Angola and São Tomé e Príncipe Ports Pilot; - Sailing Directions - Cabo Verde – Volumes I to V; - Sailing Directions (Pleasure Craft) – Continental Portugal (Portuguese/English); 		
Surveying vessels/ Aircraft – Bâtiments <i>hydrographiques/aéronefs – Buques</i> <i>hidrográficos/Aeronaves</i> Almirante GAGO COUTINHO D. CARLOS I ANDRÓMEDA AURIGA ATLANTA FISÁLIA	Displacement	Date Launched	Crew
	2285	1985	49
	2285	1989	49
	245	1985	24
	245	1987	24
	38.7	1981	3
	38.7	1981	3
Other information of interest – Autres informations utiles - Otra información de interés.	IHPT School of Hydrography and Oceanography provides Hydrography and Oceanography FIG/IHO category A and B courses.		

ANNEX B

Nautical and Electronic Navigational Charts Published by Portugal since OUT 2012

Since the last Meeting, INT charts published covering areas of the Commission are listed in the following table:

NAUTICAL CHARTS					
Number		Title	Scale 1:	Issue	
National	INT			National	INT
61101	104	Lisboa a Freetown	3 500 000	1 st Mai 2013	
26305	1877	Porto de Lisboa (de Alcântara ao Canal do Montijo)	15 000	6 th Mai 2013	-
		A - Azinheira	7 500		
		B - Montijo	15 000		
26401	1870	Aproximações a Viana do Castelo	15 000	1 st Dez 2001 (Revised reprint Jan2013)	-
		A - Porto de Viana do Castelo	7 500		
26404	1873	Aproximações à Figueira da Foz	15 000	2 nd Jan 2014	-
		A	7 500		
		B	7 500		
36401	1922	Ilha do Porto Santo	50 000	1 st Fev 2001 (Revised reprint Dez2012)	-
		A – Baía do Porto Santo	15 000		
		B – Porto do Porto Santo	5 000		
43102	1893	Arquipélago dos Açores – Grupo Central	300 000	3 rd Jan 2013	-
46403	1891	Ilha do Faial e Canal do Faial	50 000	1 st Out 1999 (Revised reprint Dez2012)	-
		A – Porto da Horta	7 500		
		B – Porto da Madalena	7 500		

Since the last Meeting, national paper charts published covering areas of the Commission are listed in the following table:

NAUTICAL CHARTS					
Number		Title	Scale 1:	Issue	
National	INT			National	INT
46405	-	Ilha Terceira	75 000	1 st Mar 2001 (Revised reprint Nov2012)	-
		A – Porto de Angra do Heroísmo	10 000		
		B – Porto da Praia da Vitória	10 000		
46401	-	Ilhas das Flores e do Corvo	75 000	1 st Dez 2002 (Revised reprint Dez2012)	-
		A – Porto das Lajes das Flores	5 000		
		B – Porto de Santa Cruz das Flores	10 000		
		C – Porto da Casa	5 000		
46201	-	Canal de São Jorge (Ilhas de São Jorge e Pico)	75 000	2 nd Nov 2012	-
26302	-	Porto da Nazaré	7 500	2 nd Fev 2014	-
		A	3 000		
26410	-	Póvoa do Varzim e Vila do Conde	40 000	1 st Abr 2014	
		A – Póvoa do Varzim	10 000		
		B – Vila do Conde	10 000		

Since the last Meeting, national electronic charts published covering areas of the Commission are listed in the following table:

ELECTRONIC NAVIGATIONAL CHARTS					
Number	NC	UB	Title	Edition	Date
PT111101	11101	1	PORTUGAL CONTINENTAL, ARQUIPÉLAGO DOS AÇORES E ARQUIPÉLAGO DA MADEIRA	5	SET13
PT111101	11101	1	PORTUGAL CONTINENTAL, ARQUIPÉLAGO DOS AÇORES E ARQUIPÉLAGO DA MADEIRA	6	OUT13
PT221101	21101	2	MONTE DE S.GIAN A AYAMONTE	3	JAN14
PT233101	33101	2	ARQUIPÉLAGO DA MADEIRA	3	MAI14
PT241101	41101	2	ARQUIPÉLAGO DOS AÇORES	2	MAI14
PT324203	24203	3	NAZARÉ À ERICEIRA	4	FEV13
PT324204	24204	3	ERICEIRA À PRAIA DAS AREIAS BRANCAS	5	FEV13
PT343102	43102	3	ARQUIPÉLAGO DOS AÇORES – GRUPO CENTRAL	3	SET13
PT426404	26404	4	APROXIMAÇÕES À FIGUEIRA DA FOZ	2	JUN14
PT446201	46201	4	CANAL DE S.JORGE (ILHA DE S.JORGE E PICO)	3	SET13
PT526305	26305	5	PORTO DE LISBOA (CANAL DO BARREIRO AO CANAL DO MONTIJO)	6	JAN14
PT528507	26404	5	PORTO DA FIGUEIRA DA FOZ	2	JUN14
PT548504	46403	5	ILHA DO FAIAL – PORTO DA HORTA	2	JAN13
PT 56602A	67502	5	ARQUIPÉLAGO DE CABO VERDE – ILHA BRAVA - FURNA	1	FEV13
PT 56602C	67502	5	ARQUIPÉLAGO DE CABO VERDE – ILHA DE SANTIAGO – TARRAFAL	1	FEV13
PT 56602D	67502	5	ARQUIPÉLAGO DE CABO VERDE – ILHA DO MAIO – PORTO INGLÊS	1	NOV12

ANNEX C

UPDATES TO C55

Status of Hydrographic Surveys

		A	B	C
Portugal (Continental Portugal)	depths < 200 m	100	0	0
	depths > 200 m	99	0	1
Portugal (Madeira Archipleago)	depths < 200 m	65	0	35
	depths > 200 m	66	1	33
Portugal (Azores Archipelago)	depths < 200 m	60	40	0
	depths > 200 m	56	1	43

Status of Nautical Charting

		A	B	C
Portugal (Continental Portugal)	Offshore passage / Small	100	0	100
	Coastal passage / Medium	100	0	100
	Approaches Ports / Large	100	0	100
Portugal (Madeira Archipleago)	Offshore passage / Small	100	0	100
	Coastal passage / Medium	100	0	100
	Approaches Ports / Large	100	0	100
Portugal (Azores Archipelago)	Offshore passage / Small	100	0	100
	Coastal passage / Medium	100	0	100
	Approaches Ports / Large	100	0	100

The other items have no changes.

ANNEX D

Portuguese Tide Gauge Network

