

9th Conference of the EAthC

6-8 December 2006, Dakar, Senegal

REPORT FROM PORTUGAL

INSTITUTO HIDROGRÁFICO
(IHPT)



INTRODUCTION

This report describes the main technical activities and developments of the IHPT during the period from October 2004 to December 2006. It was elaborated in order to be presented to the 9th Conference of the EAHC, and specially covers the following areas: Hydrography, Cartography, Information Technologies and GIS, Marine safety, IBCEA project and Technical Assistance and Training.

1- HYDROGRAPHIC OFFICE

All the information is included in Annex Alfa.

2- SURVEYS

The hydrographic surveys within the IHPT are done with both singlebeam and multibeam echosounders, using the GPS (Differential or RTK/OTF) for positioning.

The singlebeam echosounders with digital output (ATLAS DESO 20/22/25, MARIMATECH E206, and KNUDSEN 320 M) are used with automated data acquisition systems (currently the HYPACK). The values of sound speed in the water are collected by sound speed profilers (APPLIED MICROSYSTEMS SVP-16 and SVP PLUS). ATLAS calibration transducers are also used. The heave is measured with an inertial motion sensor (TSS 320/333/335, SEATEX MRU5 or MRU H). One echosounder KONGSBERG EA600 with side scan transducers was recently acquired and is currently under evaluation.

Data processing is done with the same applications used for the data acquisition (HYPACK). For presentation and archive purposes the data is transferred to CARIS GIS. The CARIS files are the layout used to store the hydrographic data that can be readily used for cartographic production.

The IHPT is presently operating several multibeam echosounder systems (MBES): for shallow waters a portable system (KONGSBERG EM 3000), for coastal waters (KONGSBERG EM 950) on board a 15 metre launch and for deep waters (KONGSBERG EM 120) on the hydrographic ship N.R.P. "D. Carlos I". One portable KONGSBERG EM 3002 is currently under evaluation.

The new hydrographic ship N.R.P. "Almirante Gago Coutinho" is being equipped with two multibeam echosounder systems, one for deep waters (KONGSBERG EM 120) and other for coastal waters (KONGSBERG EM 710). She will be operational in April 2007.

All the referred multibeam systems include one SEATEX SEAPATH 200 or SEAPATH 200 RTK (for positioning, heading, pitch, roll and heave measurements), one sound speed sensor at the transducer draft (APPLIED MICROSYSTEMS SMART PROBE) and a sound speed profiler (APPLIED MICROSYSTEMS SVP-16 or SVP PLUS). Data processing is done with the Hydrographic Information Processing System (CARIS HIPS).

The coastal topography and horizontal control is being done, for the most part, with geodetic GPS methods, including kinematic positioning and RTK/OTF (with TRIMBLE 4000/5700/5800 series). Sometimes hydrographic surveys are complemented with GPS surveys on-shore, done by walking surveyors or with a moto-quad. Nevertheless, to complement GPS observations, topographic total stations (LEICA TC 305 and LEICA TC 1800) are also used. Data processing is performed with TRIMBLE software (TRIMBLE Geomatics Office), AutoCAD MAP and in-house software COORD (for pure traditional measurements - angles and distances).

GPS RTK/OTF techniques for tide measurements are sometimes used. For the areas that are surveyed on a regular basis, the local geoidal height was computed, in order to have a geoid model with an adequate accuracy.

The procedures (planning, execution and processing) of hydrographic surveys within the IHPT are in accordance with the IHO Special Publication S-44 (4th Edition, 1998). Special attention has been paid to the development of procedures for Quality Assurance (QA) and Quality Control (QC) of hydrographic data. These include: error budgets, analysis of the digital terrain model from the raw data, statistical analysis per beam, and analysis of the spatial and temporal variation of sound speed profiles on depth measurement and positioning.

A new side scan sonar system (KLEIN 5000) was also acquired, including a digital processing software package (TRITON ELICS).

During the last two years, most of the hydrographic surveys were done in specific coastal areas and in harbours and their approaches. The geological continental shelf of Continental Portugal is completely surveyed with echosounders and electronic positioning systems, as well as the more critical areas of the Archipelagos of Açores and Madeira. So, the next systematic resurvey of Portuguese coastal waters will be done with MBES and GPS positioning.

The Hydrographic Ship “D. Carlos I” is being employed on surveys for the project of the extension of the Portuguese Continental Shelf to be presented to United Nations Organization.

Nevertheless she has been used in several research projects in cooperation with national and foreign universities and other research institutions.

Some surveys for environmental studies and coastal protection were also done. In these surveys, hydrographic and topographic integrated methods were used and, commonly, simultaneous wave, tidal and current data were acquired. In some cases, these surveys included light seismic geological methods and sediment and water chemical analysis.

An in-house Hydrographic Data Warehouse (HDW), using an ORACLE database management system, was implemented and is being uploaded with

all the bathymetric data available. The older survey fair sheets are being vectorized to integrate the HDW too.

3- NEW CHARTS AND UPDATES

The paper chart production in the IHPT is fully done by the Computer Assisted Cartography system (CAC), since mid 2004. All charts are stored in digital files, which are then used for Electronic Navigational Chart (ENC) production.

The CAC is based on CARIS GIS. Some topographic data processing and import/export are also done using AutoCAD MAP. Developments using the several CARIS modules were done, as for instance the automatic chart correction and several scripts for QC and spatial data assimilation, these using specially the Visual Basic, C and TCL/TK programming languages. The main development in the last years was the total transfer from UNIX to WINDOWS workstations, running the new versions of CARIS GIS.

The IHPT also produces nautical charts for special purposes as charts for fishermen, charts for pleasure crafts and special charts for training purposes. All those charts are in accordance with IHO specifications and were very well accepted from users.

All the IHPT new charts and new editions are bilingual (in 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 2004 is presented in Annex Bravo.

The production of ENC cells started with some CARIS software modules (HOM) but the main work is done using software produced by 7 -C's (ENC Tools) and HydroServices (dKart Inspector). The IHPT cells format is S-57/Edition 3.1. Each of the IHPT ENC is broadly equivalent to a paper chart both in terms of its area of coverage and its content.

The final validation of the ENC cells is made with the ECDIS software ECPINS-M. The Portuguese Navy ships equipped with ECDIS continuously verify the IHPT ENC cells in real navigation conditions.

The IHPT is a member and participates actively in the works of the International Centre for ENCs (IC-ENC), including in their Technical Experts Working Groups. Presently, 56 Portuguese ENC cells are available for distribution by the IC- ENC, charting all the oceanic and coastal waters of Portugal, as well as the main harbours and their approaches.

The issuing of Notices to Mariners (NtM), which affect the paper charts and the corresponding ENC cells, is coordinated with the issue of the ENC CDs by the IC- ENC. It should be noted that the number of ENC updates increased enormously and so the production and validation of updates continues to be one of the major works of the IHPT ENC production team.

A list of the ENC cells produced by the IHPT is presented in Annex Bravo.

The IHPT is using CARIS Hydrographic Production Database (HPD), which allows a full integration of the cartographic production, both paper charts and ENC cells. The HPD works with an ORACLE 9i database management system and provides a single and seamless database for all the cartographic information available in the IHPT. The data format follows the S-57 specifications and all the spatial information use WGS84. This system is currently in use and the first chart is expected to be produced in 2007.

Following the full digital cartographic process, since middle 2005 and upon exhaustive tests of plotters, papers and inks, the IHPT is using the Print-on-Demand system in order to print the nautical charts, as well their sub products, as they are requested by the users.

The IHPT participates in the COASTCHART project, funded by the European Space Agency, as well as UKHO, SHOM-FR and IHM-ES. This project aims to get the digitized coastline of central and western Africa with

the access to satellite imagery. Nevertheless, until present date no work has been done on this project.

4- NEW PUBLICATIONS AND UPDATES

Since 2004, the IHPT published the following nautical publications:

- Annual Group of Notices to Mariners (2005);
- Annual Group of Notices to Mariners (2006);
- Sailing Directions of Portugal – Continental Portugal – “Rio Minho ao Cabo Carvoeiro” – 3rd Edition (2005);
- Sailing Directions of Portugal – Continental Portugal – “Cabo Carvoeiro ao Cabo de São Vicente” – 3rd Edition (2006);
- Sailing Directions of Portugal – Continental Portugal – “Marinas e Portos de Recreio” – 3rd Edition (2005);
- Aids to Navigation – List of Lights, Buoys, Beacons and Fog Signals – 7th edition (2005)

Annually, the IHPT also publishes the Tide Tables for the main harbours of Continental Portugal and the Archipelagos of Açores and Madeira. During the last years some of the tidal constituents continued to be recalculated using more recent tidal observations. In 2002 started a project to automate the tidal stations in order to provide remote access to their data.

5- MARTIME SAFETY INFORMATION

The IHPT, as national coordinator for the Maritime Safety Information, provides a 24h service of Navigational Warnings, in cooperation with the NAVAREA II coordinator.

NAVTEX broadcast is made both in English and Portuguese and it is transmitted from Monsanto (near Lisbon) and from Horta (in the Açores Archipelago). Madeira Archipelago NAVTEX will be established in the near future.

The GMDSS coverage is yet not completed due to some delays on the establishment of the Digital Selective Call capability.

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

Regarding the Broadcast Stations (BS) from the national differential GPS network, 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 in Madeira Archipelago (Porto Santo station).

AIS coastal stations are operational since summer of 2006 both in Açores and Madeira Archipelagos. For the continental coast of Portugal, this system is being installed.

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Updates are listed in Annex Charlie

7- CAPACITY BUILDING

The 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.

In 2005 under the existing Cooperation Agreement with Portugal, a technical visit to Cabo Verde was carried out in order to assess the current hydrographic and cartographic situation of the state, aiming to define a new chart scheme and the corresponding hydrographic surveys.

These visits, together with hydrographic surveys, already done in 2004, led to the first Edition of Cabo Verde nautical chart number 66301 “Porto da Praia” (Santiago Island).

In 2006 hydrographic surveys were carried out in Porto Grande (São Vicente Island) in order to publish the new edition of the nautical chart for that harbour.

Several foreign students from Moçambique, Tunisia and Cabo Verde attended the Specialization Course in Hydrography (FIG/IHO Category A) at the IHPT. In this academic year, 2006/2007, there is one civilian attending the Course from Moçambique and one officer from the Tunisian Navy.

8- OCEANOGRAPHICS ACTIVITIES

a. GEBCO/IBCEA

The 2nd Edition of IBCEA Sheet 1.01 (Portugal - Continental Portugal) and the 1st Edition of the IBCEA Sheet 1.03 (Portugal - Archipelago of Açores) were published in April 2006.

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

The work for IBCEA Sheet 1.05 (Cabo Verde) was not initiated yet.

b. Tide Gauge Network

The Portuguese tide gauge network consists of 19 tidal stations spread over continental Portugal, Açores and Madeira Archipelagos. All stations but Cascais and Lagos belong to the IHPT. The IHPT is in charge of their installation, maintenance and data collecting. Cascais and Lagos stations are property of the Portuguese Geographic Institute. Mainly the tide gauges in our network are floating and stilling well (A.OTT), acoustic (Next Generation Water Level Measurement System) and pressure type (Minitroll, Valeport and Druck).

Recently there was an acquisition of several Krohne radar tide gauges which are being installed at this time.

Annex Delta depicts the Portuguese tide gauge network, with its major stations.

Portugal is also a member of the Global Sea Level Observing System (GLOSS) contributing with mean sea level data from Cascais, Ponta Delgada, Santa Cruz das Flores and Funchal.

9- OTHER ACTIVITIES

a. Information technologies and GIS

The IHPT has an Internet site (www.hidrografico.pt) presenting information about its organization, main activities, products offered and specific on-line data.

The Notices to Mariners issued by the IHPT are also available in the IHPT Internet site, as well as general information on the Portuguese Nautical Charts and Nautical Publications.

Databases and related applications are being developed using ORACLE 8i or 9i. They include not only hydrographic and cartographic applications but also environmental and coastal management products. The basis of these is SIGAMAR (Geographic Information System for the Marine Environment).

SIGAMAR is a geographic information system for the marine environment under development at IHPT and deals with technical and scientific data within IHPT. The main SIGAMAR's development objectives are to improve the internal production processes and to support the operational, planning and strategic decision-making. Its core is an Oracle Spatial database management system that is explored in several ways producing tables, charts, web pages and reports, and feeding several GIS packages.

This system is also being used to support IC-ENC by providing a world ENC availability catalogue (independent of maker or distributor) for mariners to use.

ANNEX ALFA

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>Atributions principales du S.H.</i> <i>Principales funciones del S.H.</i> | Hydrographic Surveys, Analogue and Digital Nautical Charts, Sailing Directions, Lights and Radio Signals Lists, Notices to Mariners (bi-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 defense 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 de referencia</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 –</i> <i>Apellidos y graduación del Director</i> | Vice-admiral José Augusto de Brito, General Director |
| Tonnage – Tonelaje | 2006 = 1,271,004 |
| Total Budget - Budget total – Presupuesto Total | 7 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> | 227 |
| 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. | 34 56 |
| 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; - Sailing Directions - Angola and São Tomé e |

| | | | |
|---|--|---------------|------|
| | Principe 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> | Displacement | Date Launched | Crew |
| Almirante GAGO COUTINHO | 2285 | 1985 | 49 |
| D. CARLOS I | 2285 | 1989 | 49 |
| ANDRÓMEDA | 245 | 1985 | 24 |
| AURIGA | 245 | 1987 | 24 |
| ATLANTA | 38.7 | 1981 | 3 |
| CORAL | 38.7 | 1981 | 3 |
| FISÁLIA | 38.7 | 1981 | 3 |
| Other information of interest – Autres <i>informations utiles - Otra información de interés.</i> | Own coast and harbours plus main traffic routes linking the Portuguese speaking countries in Africa. Hydrography and Oceanography level A and B course | | |

ANNEX BRAVO

PAPER AND ELECTRONIC CHARTS EDITED BY PORTUGAL SINCE 2004

PAPER CHARTS

| NUMBER | INT | TITLE | EDITION | REPRINT | DATE |
|--------|------|--|----------------|----------------|--------|
| 26408 | 1883 | APROXIMAÇÕES A SINES | 2 ^a | - | OCT 04 |
| 26302 | - | PORTO DA NAZARÉ – Plano do Porto da Nazaré | 1 ^a | - | OCT 04 |
| 26306 | 1878 | PORTO DE LISBOA – do Cais do Sodré a Sacavém | 4 ^a | 1 ^a | AGO 04 |
| 25R08 | - | CABO ESPICHEL À LAGOA DE SANTO ANDRÉ | 1 ^a | 3 ^a | NOV 04 |
| 26403 | 1872 | APROXIMAÇÕES A AVEIRO – Barra e Porto de Aveiro | 1 ^a | - | JAN 05 |
| 26404 | - | APROXIMAÇÕES A FIGUEIRA DA FOZ – Barra e Porto da F. Foz | 1 ^a | - | MAI 05 |
| 25R11 | - | PONTA DE SAGRES A VILAMOURA | 2 ^a | - | FEB 05 |
| 24205 | - | CABO DE SINES A LAGOS | 2 ^a | - | JUN 05 |
| 24204 | - | CABO DA ROCA AO CABO DE SINES | 2 ^a | - | JUN 05 |
| 24P05 | - | CABO DE SINES A LAGOS | 2 ^a | - | JUN 05 |
| 24P04 | - | CABO DA ROCA A CABO DE SINES | 2 ^a | - | JUN 05 |
| 24206 | - | CABO DE S. VICENTE À FOZ DO GUADIANA | 2 ^a | 1 ^a | APR 05 |
| 157 | - | SELVAGEM PEQUENA E ILHÉU DE FORA | 2 ^a | 1 ^a | MAR 05 |
| 156 | - | SELVAGEM GRANDE | 2 ^a | 1 ^a | MAR 05 |
| 25R09 | - | LAGOA DE SANTO ANDRÉ AO CABO SARDÃO | 2 ^a | - | JUL 05 |
| 105 | - | ILHAS SELVAGENS | 2 ^a | 1 ^a | JUL 05 |
| 26303 | 1875 | BAÍA DE CASCAIS E BARRAS DO RIO TEJO | 7 ^a | - | JUL 05 |
| 26304 | 1876 | PORTO DE LISBOA – de Paço de Arcos ao Terreiro do Trigo | 6 ^a | - | MAY 05 |
| 24I01 | - | CABO DA ROCA AO CABO DE SINES | 1 ^a | - | DEC 05 |

PAPER CHARTS (Cont.)

| NUMBER | INT | TITLE | EDITION | REPRINT | DATE |
|--------|------|--|----------------|---------|--------|
| 66401 | - | PORTO DA PRAIA – ILHA DE SANTIAGO – CABO VERDE | 1 ^a | - | MAI 06 |
| 26312 | - | BARRA E PORTO DE VILA REAL DE SANTO ANTÓNIO | 2 ^a | - | FEB 06 |
| 26305 | 1877 | PORTO DE LISBOA – de Alcântara ao Canal do Montijo | 4 ^a | - | MAY 06 |
| 25R12 | - | VILAMOURA À FOZ DO GUADIANA | 2 ^a | - | MAY 06 |
| 25R07 | - | CABO DA ROCA AO CABO ESPICHEL | 2 ^a | - | JUL 06 |
| 25R10 | - | PONTA DA ATALAIA AO BURG AU | 2 ^a | - | JUL 06 |
| 23203 | 1811 | CABO CARVOEIRO A VILAMOURA | 4 ^a | - | SEP 06 |

ELECTRONIC NAVIGATIONAL CHARTS

| NUMBER | NR | N.Purp. | TITLE | EDITION | ISSUE DATE |
|-----------|-------|---------|---|---------|------------|
| PT 111101 | 11101 | 1 | Portugal Continental, Arquipélago dos Açores e Arquipélago da Madeira | 2 | 15 DEZ 04 |
| PT 111101 | 11101 | 1 | Portugal Continental, Arquipélago dos Açores e Arquipélago da Madeira | 3 | 29 SET 05 |
| PT 200201 | 201 | 2 | Arquipélago de Cabo Verde | 1 | 02 MAI 06 |
| PT 221101 | 21101 | 2 | Cabo Finisterre a Casablanca | 1 | 15 JUN 05 |
| PT 241101 | 41101 | 2 | Arquipélago dos Açores | 1 | 14 DEZ 04 |
| PT 324201 | 24201 | 3 | Caminha a Aveiro | 2 | 14 DEZ 04 |
| PT 324202 | 24202 | 3 | Aveiro a Peniche | 3 | 14 DEZ 04 |
| PT 324203 | 24203 | 3 | Nazaré a Lisboa | 2 | 14 DEZ 04 |
| PT 324204 | 24204 | 3 | Cabo da Roca a Sines | 2 | 14 DEZ 04 |
| PT 324204 | 24204 | 3 | Cabo da Roca a Sines | 3 | 28 DEZ 05 |
| PT 324205 | 24205 | 3 | Cabo de Sines a Lagos | 3 | 14 DEZ 04 |
| PT 324205 | 24205 | 3 | Cabo de Sines a Lagos | 4 | 28 DEZ 05 |
| PT 324206 | 24206 | 3 | Cabo de S. Vicente à Foz do Guadiana | 4 | 14 DEZ 04 |
| PT 336201 | 36201 | 3 | Ilha da Madeira | 2 | 15 JUN 05 |
| PT 343101 | 43101 | 3 | Arquipélago dos Açores – Grupo Ocidental | 1 | 14 DEZ 04 |
| PT 343102 | 43102 | 3 | Arquipélago dos Açores – Grupo Central | 1 | 14 DEZ 04 |
| PT 343103 | 43103 | 3 | Arquipélago dos Açores – Grupo Oriental | 1 | 14 DEZ 04 |
| PT 426401 | 26401 | 4 | Aproximações a Viana do Castelo | 2 | 08 MAI 06 |
| PT 426402 | 26402 | 4 | Aproximações a Leixões | 3 | 15 JUN 05 |
| PT 426403 | 26403 | 4 | Aveiro | 1 | 03 MAI 05 |
| PT 426404 | 26404 | 4 | Aproximações à Figueira da Foz | 1 | 12 SET 05 |
| PT 426407 | 26407 | 4 | Sesimbra | 2 | 28 DEZ 05 |
| PT 426408 | 26408 | 4 | Aproximações a Sines | 2 | 14 DEZ 04 |
| PT 426408 | 26408 | 4 | Aproximações a Sines | 3 | 28 MAR 05 |
| PT 436401 | 36401 | 4 | Ilha de Porto Santo | 2 | 17 FEV 06 |
| PT 446401 | 46401 | 4 | Ilha das Flores e Ilha do Corvo | 2 | 14 FEV 06 |

ELECTRONIC NAVIGATIONAL CHARTS (Cont.)

| NUMBER | NR | N.Purp. | TITLE | EDITION | ISSUE DATE |
|-----------|-------|---------|--|---------|------------|
| PT 446403 | 46403 | 4 | Ilha do Faial e Canal do Faial | 1 | 08 MAI 06 |
| PT 446405 | 46405 | 4 | Ilha Terceira | 1 | 14 DEZ 04 |
| PT 446406 | 46406 | 4 | Ilha de S. Miguel | 1 | 14 DEZ 04 |
| PT 446407 | 46407 | 4 | Ilha de Santa Maria | 1 | 12 SET 06 |
| PT 526302 | 26302 | 5 | Porto da Nazaré | 1 | 16 FEV 05 |
| PT 526303 | 26303 | 5 | Barras do porto de Lisboa e baía de Cascais | 5 | 08 MAR 06 |
| PT 526304 | 26304 | 5 | Porto de Lisboa (Paço de Arcos ao Terreiro do Trigo) | 4 | 09 MAR 06 |
| PT 526305 | 26305 | 5 | Porto de Lisboa (Alcântara ao Montijo) | 4 | 17 JUL 06 |
| PT 526308 | 26308 | 5 | Barra e porto de Setúbal | 2 | 27 OUT 05 |
| PT 526309 | 26309 | 5 | Porto de Setúbal (da Carraca à Ilha do Cavalo) | 1 | 15 JUN 05 |
| PT 526311 | 26311 | 5 | Barra e portos de Faro e Olhão | 1 | 27 OUT 05 |
| PT 526312 | 26312 | 5 | Barra e porto de Vila Real de Santo António | 1 | 08 MAI 06 |
| PT 528501 | 26401 | 5 | Porto de Viana do Castelo | 2 | 08 MAI 06 |
| PT 528505 | 26402 | 5 | Barra do rio Douro | 3 | 15 JUN 05 |
| PT 528506 | 26403 | 5 | Barra e Porto de Aveiro | 1 | 03 MAI 05 |
| PT 528507 | 26404 | 5 | Barra e Porto da Figueira da Foz | 1 | 12 SET 05 |
| PT 528513 | 26407 | 5 | Porto de Sesimbra | 2 | 27 OUT 05 |
| PT 528514 | 26408 | 5 | Porto de Sines | 2 | 14 DEZ 04 |
| PT 528514 | 26408 | 5 | Porto de Sines | 3 | 28 MAR 05 |
| PT 538501 | 36401 | 5 | Baía e Porto do Porto Santo | 2 | 09 MAR 06 |
| PT 548501 | 46401 | 5 | Porto da Casa | 2 | 19 SET 06 |
| PT 548504 | 46403 | 5 | Porto da Horta | 1 | 11 MAI 06 |
| PT 548505 | 46403 | 5 | Porto da Madalena | 1 | 17 JUL 06 |
| PT 548514 | 46405 | 5 | Porto de Angra do Heroísmo | 2 | 12 SET 06 |
| PT 548519 | 46406 | 5 | Porto de Ponta Delgada | 2 | 12 SET 06 |
| PT 548524 | 46407 | 5 | Porto de Vila do Porto | 1 | 12 SET 06 |

ANNEX CHARLIE

UPDATES TO S55

Status of Hidrographic Surveys

| | | A | B | C |
|--|----------------|----------|----------|----------|
| Portugal (Continental Portugal) | depths < 200 m | 100 | 0 | 0 |
| | depths > 200 m | 83 | 0 | 17 |
| Portugal (Madeira Archipleago) | depths < 200 m | 62 | 0 | 38 |
| | depths > 200 m | 28 | 0 | 72 |
| Portugal (Açores Archipelago) | depths < 200 m | 53 | 46 | 1 |
| | depths > 200 m | 3,5 | 1 | 95,5 |

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 (Açores 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 DELTA

Portuguese Tide Gauge Network

