Note

History of the Argentinian Naval Hydrographic Service (1879 – 2004) Marking Its 125th Anniversary

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On 6 June 2004, **the Naval Hydrographic Service of the Argentine Navy** celebrated its 125th anniversary, thus making it one of the oldest hydrographic services in the southern hemisphere responsible for the safety of navigation and the production of specific nautical charts.

Hydrographic surveying activities were very slow to develop along the coast of Argentina. In the distant past, at the beginning of the country's history, adventurous seamen came to these coasts and helped to update the charts of that time, but it was really in the last quarter of the XVIIIth century that the scientific nature of hydrographic activities took on more importance.

The need to find new maritime routes to facilitate trade and other types of activity obliged Argentina to improve its knowledge of the ports and coastlines. This sit-

Hydrographic ship A.R.A. "Comodoro Rivadavia" (left) and Oceanographic ship A.R.A. "Puerto Deseado" (right)

uation resulted in the need to create a body which could coordinate all hydrographic activities which, up to that time, had been undertaken in a rather disorganised manner and to meet the requirements of the safety of navigation.

By decree, dated 1 January 1879, the Central Hydrographic Office was created. This hydrographic office was responsible for collating and maintaining the country's charts and sailing directions and those of the world's oceans, as well as for producing charts and the creation of a meteorological observatory to assist naval ships; this was quite unprecedented, as at that time ships undertook voyages without any knowledge of the meteorological conditions. The Hydrographic Office was responsible for providing information on shallows and drying reefs and advising shipmasters that any information obtained should be reported as soon as they returned to port. Finally, on 6 June 1879 the functioning of the Hydrographic Office was formalised with proper regulations, establishing that the charts and maps to be produced should be referenced to the Cordoba national meridian and should be reduced to a scale of 1:200,000. Colonel Clodomiro UTURBEY was appointed Hydrographer and the Professor of the Naval College, Rafael LOBO, became Deputy Director. Over the years the Hydrographic Office changed its name from Dirección General de Navegación e Hidrografía (1920) to to the present name, which it has kept since 1957. Knowledge of the Argentinian territory, both inland and along the coastline, constituted the most significant activity of the Navy. The efforts made in improving the knowledge of the coasts and in establishing a buoyage and system of beacons should be underlined.The first Marine Observatory was built in 1881 and a little later the first Meteorological Observatory was created. In that same year the gunship "*Bermejo*" was tasked with hydrographic surveying work in the Bahía Blanca zone. The captain placed an old schooner, "*Manuelita*", as a light ship in front of Monte Hermoso, to indicate the entrance to the port of Bahía Blanca. As a result on 6 October 1881, the first lighthouse was established on the Atlantic coast.

The Law of 29 October 1883 gave more importance to exploration and construction of aids to navigation including the establishment of a complete signal station at the entrance of the Rio de la Plata, in the port of Bahía Blanca and on the Isla de los Estados. The lighthouse of San Juan del Salvamento was built on the Isla de los Estados (1884).

Work undertaken by the gunship "*Constitución*", under the command of Martin Rivadavia, in the Bahía de San Blas between 1881 and 1884, was very important due to its far-reaching impact and results: the work included buoyage, soundings, meteorological surveys and local explorations. It is noteworthy that all this information was used in the preparation of the first nautical chart **Puerto san Blas**, which was produced in 1883.

In 1889 the Argentinian Chart No. 1 of the Rio Negro bar was published. This chart was the result of intensive and complex hydrographic surveying activity in the area due to the river's particular characteristics. A detailed survey was carried out between 1899 and 1900 to update the chart of the Beagle Channel, south of Tierra del Fuego. The survey results provided important information on the behaviour of the channel.

The Hydrographic Office also began to publish its first nautical publications: the first **Derrotero de las Costas Argentinas** (Sailing Directions of the Argentinian Coasts) was published (1900); the first edition of the official list of "**Faros y Senales Maritimas**" (Lighthouses and Maritime Signals) (1916) was published and the fortnightly publication "**Avisos a los Navegantes**" (Notices to Mariners) (1918) was introduced, which referred to the sea and coast of Argentina; all these publications were issued based on information collected during hydrographic surveys. In 1917 the "**Anales Hidrograficos**" (Hydrographic Annals) was published, comprising reports on surveys and specific tasks. In 1920 the annual publication of the **Tide Tables** was introduced in an official edition, covering the six main ports of the country.

Following the Swedish expeditions to Antarctica, the first Magnetic and Meteorological Observatory was set up on the Isla del Año Nuevo (1902), which would provide support to the subsequent tasks of explorers who planned to spend winter in the Antarctic. Immediately afterwards, surveys were carried out to produce the magnetic chart of the Argentinian coasts.

In 1921, Argentina, represented by the General Directorate of Navigation and Hydrography, was

amongst the 18 founding Member States of the **International Hydrographic Bureau**. Today the Hydrographic Office is a full member state of the International Hydrographic Organization (IHO), and participates through its presence at various international events, its active membership in some of the Working Groups and Commissions established by this Organization or simply by providing their views on various subjects of interest.

The first Argentinian Antarctic Naval Detachment (1947) was sent to the Melchior Archipelago followed by Decepción (1948) and Almirante Brown (1950). In that last year various oceanographic tasks and observations at depths reaching 700 m were carried out in Argentinian Antarctic.

Around 1950 the nautical charts covering the coasts between the Rio de la Plata and Tierra del Fuego were completed.

From 1956 onwards, in conjunction with the joint participation in the surveys related to the International Geophysical Year, the systematic tasks began (which are still being carried out today), which include physical, chemical, biological, geological and geophysical aspects, in addition to the tidal ones, already started at the beginning of the XXth century, together with geomagnetic observations. At the same time, marine meteorological tasks, including observations at fixed stations and on floating units, covering glaciology and floating ice surveys were carried out.

In 1962, in order to cater for the needs of cartographers, the Buenos Aires School of Cartography was established. From 1966, the School has been using a classroom in a building situated very close to the central headquarters and today operates in the same location under the name - School of Marine Sciences.

Hydrographic launch A.R.A. "KUALCHIN"

During the period 1963-1967 a complete hydrographic survey of the Rio de la Plata was undertaken providing important hydrographic information which has been used in producing the charts of that area.

Argentina, through the Naval Hydrographic Service, co-operated in two global projects: the

"International Year of the Quiet Sun" (1967- 1968) and the "Upper Mantle Committee" (1968). The main objective of this latter project was the geophysical study of the first 1000 kilometres of the Earth's mantle.

The Argentinian Oceanographic Data Centre (CEADO) was established in 1977, as part of the Hydrographic Service and as the National Official Centre. It is through this Centre that Argentina participates in the International Marine Information Exchange System.

On 1 January 1977 the Service started broadcasting NAVAREA messages, a worldwide radio navigational warning service for mariners including urgent notices to mariners, and on 1 April that same year the Omega Station ARGENTINA Golfo Nuevo of the global positioning system, became operational as a public service.

Today this Service is responsible for NAVAREA VI and liaises with international and national institutions concerned with this matter. It also maintains the lighthouses on the southern coasts of the Southwest Atlantic, islands and Antarctic Peninsula, and defines and coordinates the marking of more than 3,000 kilometres of river navigation. Enormous technological advances have been made as regards satellite geodetic positioning over the past years. This is due to the Service permanently working on the improvement and execution of hydrographic and oceanographic surveys and the production of nautical charts referenced to the World Geodetic System 1984 (WGS84).

Modern navigation has been linked for some years with the concept of electronic navigation, which has involved many changes and developments in the navigation of a vessel using all the technology available to the mariner. The important changes made to navigational systems allow mariners today to take advantage of a certain level of information and automatic assistance which had previously not been available, whether it be in terms of quantity and continuity, accuracy, certainty and availability thanks to the configuration of an expert system on board which has greatly assisted in improving the conditions of navigational safety. This system can optimise the employment time of the vessels, the routes and maritime terminals; in the case of the latter, it is not only from the point of view of their use, but also their upkeep, and therefore all port arrival and departure manoeuvres can be executed more safely, reducing probable damage to berthing places and vessels.

The development of this technology has led to Hydrographic Offices all over the world abandoning former technologies and has made them adopt changes and innovation in the use and presentation of hydrographic information in a digital format, making use of IT support to satisfy the ever-increasing demand for accurate charts.

As in the rest of the world, the Argentine Hydrographic Office was challenged by radical transformation in the nautical chart production process in accordance with the specifications and standards established by the International Hydrographic Organization (IHO), whether it be conventional (paper chart), electronic or raster versions.

The first charts prepared digitally were edited in 1997, both covering the Rio de la Plata. At the same time the compilation of the first ENC cell of Puerto de Mar del Plata was started.
At the end of 1998, digitally processed charts were provided on CD ROM in BSB Raster format, updated every two weeks.

The Naval Hydrographic Service has been working with the IHO Transfer Standard for Digital Hydrographic Data (S-57) since 1998. The first ENC cells were prepared following Edition 3.0 and today Edition 3.1 is being used. The first ENC cells produced were the following:

AR602510 - Puerto Mar del Plata, Scale 1:2,500
AR603590 - Puerto Caleta Paula,
Scale 1:12,500
AR60357B - Puerto Comodoro Rivadavia,
Scale 1:5,000

To identify the most useful area to be covered by ENC data, the main Shipping Routes published on the IHO web site were reviewed.

Among these routes, the only one of global interest was in the South Atlantic which directly links up the area of the Rio de la Plata, with the ports in Brazil. It is the commercial route that comes from northern Europe, heading to the Buenos Aires zone, providing access to the Paraguay – Parana waterway.
Due to the commercial importance of the area, and

the interest highlighted by the IHO to cover these routes with ENC data, it was decided to continue the preparation of ENC cells of the Rio de la Plata area.

The objective of the first phase was to provide complete coverage with data in S-57 format of the Rio de la Plata area; therefore the following ENC cells were prepared:

AR201160 - Rio de la Plata Medio y Superior, Scale 1:250,000
AR201130 - Rio de la Plata Exterior, Scale 1:250,000

Once the total coverage of this area was completed, the production of cells, at large scales, was begun. Today, in the production process we have:

AR60155A - Puerto de Olivos y Centro Naval, Scale 1:7,500
AR501560 - Puerto de Buenos Aires, Scale 1:20,000
AR40155A - De Puerto Tigre a Darsena de Propaneros, Scale 1:50,000

Amongst the usual tasks that any Hydrographic Office in the world carries out, it is important to underline that the Naval Hydrographic Service carries out certain other activities which, in many countries, are undertaken by other national agencies.

1. Provides the official national time service (as from 1923) and the frequency service (since 1955), through the Naval Observatory.
2. The publication of the Nautical Almanac.
3. Executes and cooperates in combined research and development projects in the areas of Oceanography, Marine Meteorology and Tidal Observations, services not only provided to the Navy but which also contribute to the economic progress of the country.

The Naval Hydrographic Service has cooperated and continues to cooperate in large international projects and has an active and productive relationship with other Hydrographic Offices, Universities, Research and Technical Institutions. The activities conducted by the Service have increased and continue to grow in number and importance as years go by. This is due to:

1. The geographic characteristics of the Republic of Argentina generate a great interest in the maritime aspects of the country.
2. The country's attitude and public awareness as regards the sea and its importance.

Argentina, which is situated in the southern hemisphere, is predominantly oceanic with vital water ways which are used for the major part of its foreign trade; it has a large continental shelf (one of the largest in the world) and abundant natural resources which are all aspects which highlight the importance of the sea and its primary role in our country's development.

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