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THE SITUATION OF HYDROGRAPHY AND NAUTICAL CHARTING IN THE REPUBLIC OF SEYCHELLES

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THE REPUBLIC OF SEYCHELLES

The Republic of Seychelles consists of 115 islands, with a total surface area of 453 km², spread over a vast Exclusive Economic Zone of over 1 374 000 km². Mahé, the largest of the islands, on which stands the country's capital and port, Victoria, is 27 km long and 8 km wide. Seychelles is made up of two distinct physical features, the granitic island clustered in a radius of 30 km and the coralline islands sprawling over a much wider area. The granitic islands of Seychelles, with their rocky surfaces, tall hills, narrow coastal plains, and mist forest, are the only ones of their kind in the world situated in the middle of an ocean.

The Seychelles is believed to have been sighted by the great navigator Vasco da GAMA at the turn of the 16th century. The first known map to show Seychelles was said to have been charted by the Portuguese cartographer, Alberto CANTINO. During 1742 and 1744, two French expeditions came to Seychelles with the object of charting its waters as they were considered a navigational hazard to ships on the Indian sea route. The first settlement of the islands, consisting of French landowners and African slaves, took place in 1770. Today, the population which consists of a mixed race of European, African and Asian origin is estimated to be 73,000. France maintained control over the islands until 1814 when it was ceded to Britain and in 1976 the Seychelles became independent.

THE HYDROGRAPHIC BRIGADE

During the colonial period, the United Kingdom carried out surveys until 1976, in various parts of the seas surrounding the Seychelles islands when the

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activity had to be abandoned by the UK due to resource constraints and commitments within its own waters.

The Brigade was established in 1981 with the assistance of the French Cooperation Ministry, which provided the Republic of Seychelles with a 7.5 m survey launch and the necessary equipment to conduct hydrographic surveys of harbour and adjoining coastal waters. From 1981 to 1993, one senior petty officer from the French Service Hydrographique et Océanographique de la Marine (SHOM) has been in charge of the Hydrographic and Topographic Brigade of the Seychelles (BHTS). The plan to create such a Brigade, was to train local personnel and then to establish a modest Hydrographic Service which was to steadily expand as soon as the requisite trained manpower and the survey equipment became available. The BHTS is part of the Coast Guard (formally called Navy) and personnel has been provided by the Coast Guard on an *ad hoc* basis.

Unfortunately, due to an overall shortage of manpower in the Coast Guard, the continuous availability of the staff of the Hydrographic Brigade considered essential for any useful and sustained hydrographic activity, has not yet materialized. The SHOM has until now provided hydrographic training to two officers (the author and one officer) which until 1993 was not permanently attached to the Hydrographic Brigade.

A number of sailors, during the past, were given "on-the-job" training but due to the service requirements, they were transferred away. However, since the new organisation of the Coast Guard in 1993, it has put new emphasis on the Hydrographic Brigade, the two officers are now permanent and assisted by 5 sailors. During the month of April this year one hydrographic officer and one sailor were sent on board a French hydrographic vessel for practical training.

EQUIPMENT

The French Cooperation Ministry has so far well assisted the Republic of Seychelles by providing the following:

a) Sounding Equipment
   1 Elac LAZ 72 (now faulty)
   1 Atlas Deso 20.

b) Electronic positioning systems:
   Syledis SR 3 with 4 beacons and other accessories, (not being used at the moment due to lack of a trained technician).

c) Geodetic equipment:
   1 T 2, T 16. (now faulty)
   1 Sextant
   1 EDM Citation C 7-450 for traverse work.

d) Tides and Levelling equipment
1 wild K 01 level (unsuitable for precise work).
1 Tide Gauge OTTR 16 (installed on a permanent basis at the Coast Guard Base).

e) 1 Current meter. Type Braystoke
BFM 00 MK3.

f) Data processing system "DALI" comprising: 1 computer HP 9845; 2 disc drive units and 1 drive type plotter model 7570A (out of service due to lack of spare parts and lack of qualified personnel for maintenance).

g) 1 7.5 metre survey launch.

h) Communications: 1 Fixed VHF radio set.
5 Portable VHF radio sets.

In addition the Hydrographic Brigade has also received 5 Anderaa RCM 7 current meters and 1 WRC 7 tide gauge from the Seychelles Public Utilities Cooperation to carry out studies related to a sewerage project off the East coast of the Mahé island.

Two current meters were lost and replaced and a lost tide gauge has not yet been replaced.

At present there is no organised coordination of survey plans at a national level although the Hydrographic Brigade responded positively to the requirements of the Port and Marine services, Division and other Departments.

TIDAL OBSERVATION

A sea level bench mark was established in the early 1960's. Currently the prediction times and heights of high and low water for each day are prepared by the British Institute of Oceanographic Sciences. A tide gauge has been in operation in Victoria since the 1950's. The predictions for Victoria are computed from collected tidal data. Analysis of the data is being undertaken at the University of Hawaii for the TOGA Program. The Meteorological Office of the Ministry of Tourism and Tranport, with the collaboration of the University of Hawaii, installed a tide gauge at the Seychelles International Airport in February 1993, which transmits real time data to Hawaii.

OCEANOGRAPHIC DATA

The Hydrographic Brigade received 5 current meters from the Public Utilities to undertake current measurement around Mahé in connection with a sewerage project. The French research and development agency ORSTOM has initiated computerized oceanographic data bases for the Indian Ocean. The four data bases available are : Oceanographic Cruises Measurement, Vertical Profiles of sea temperature, sea surface conditions, Remote sensing satellite measurements. These data bases were established for fisheries research and management but they can also be used in monitoring environment and shoreline change.

TOPOGRAPHY

The Survey Division of the Ministry of Community Development is responsible for providing cadastral, engineering, topographic and control surveys of all the 115 islands. Most of the control points were established by the Directorate of Overseas Surveys of the United Kingdom, between 1950 and 1981 and some dating before that, but most of them need to be updated using modern, high precision satellite receivers.

The Survey Section has been cooperating with the Hydrographic Brigade in establishing a geodetic network for hydrographic surveys of Port Victoria and some of the islands.

Early in 1989, Seychelles submitted to the IMO certain documents relating to maritime areas to be avoided by vessel navigating in the Seychelles waters and these documents were also sent to the International Hydrographic Bureau (IHB). The IHB expressed its concern over the inadequacy of the hydrographic data within the routes which were to be followed by the ships in the approaches of Port Victoria. After an exchange of correspondence a request was made by the Seychelles Government for an expert from IHB to come and evaluate the national hydrographic and nautical charting requirements. In 1990, the expert visited the Seychelles and held discussions with various top officials involved in maritime activities and concluded that a National Hydrographic Service should be set up. This National Hydrographic Service would have a committee consisting of the BHTS and official from other Ministries and Departments involved in maritime activities. The role of the Committee would be: To approve a training programme of all personnel involved and nominate suitable officers for training abroad; To formulate a suitable schedule for surveys of Port Victoria; To prepare a hydrographic programme to cover the whole EEZ of the Republic of Seychelles; To prepare a charting scheme to cover the Republic of Seychelles; To organise a chart agency, Notices to Mariners organisation and Radio Navigation Warning Service.

Approval of short term and long term budgets including arrangement for an acquisition of funds under aid programmes, allocating priorities to the various hydrographic requirements and to monitor their progress.

It is with regret that the author notes that until now, the National Hydrographic Service has not been set up.

NEEDS FOR THE NATIONAL HYDROGRAPHIC SERVICE

The Republic of Seychelles is covered by the following nautical charts published by the British Admiralty.

Chart No.	Title
BA 721	Southern Approaches to the Seychelles Group
BA 722	Port Victoria and Approaches
BA 724	Anchorages in the Seychelles Group and outlying island
BA 740	The Seychelles Group
BA 742	Mahé, Praslin and Adjacent Islands

Most of the data depicted on those charts derives its origin from soundings dating from 1820 to 1976, some of which is clearly inadequate for the needs of modern navigation. It is also unsuitable to contribute to the exploration and exploitation of living and non living resources, recreational activities, adoption of measures to protect marine environment and for the development of ports and anchorages.

The Seychelles Bank which extends about 200 nautical miles east-south eastward and west-north westward between the parallels 3°40′ and 6°35′ South and between meridians 53°56′ and 57°10′ East is composed of many islands, islets and shoals located within its limits. Very few of the shoals and banks have been surveyed to modern and precise standards. Even the approaches to the only port, Port Victoria, have not been surveyed using side scan sonars, which is necessary to ensure that no coral pinacle has gone undetected. The only parts of the sea around the principal island, Mahé, which have been surveyed at various scales between 1958 and 1976, lie to the north east and south east and south west of Mahé.

The economy of the Republic of Seychelles is totally dependant on sea borne trade, so the government has a great responsibility to maintain up to date charts of its waters, provide adequate navigation aids to the numerous islands, to advise mariners of any charges by Notices to Mariners and Navigation Warning Services and to ensure availability of nautical publications such as tide tables, pilot's handbooks and local traffic regulations.

In addition to the above mentioned requirements for the safety of navigation, there is an increasing demand and requirement for nautical charts based on modern hydrographic data by other national agencies, to enhance the national economy by promoting tourism, fisheries research, development and maintenance

of ports, anchorages and marinas, the exploration of non living resources potential, the protection of its unique and sensitive marine environment and the establishment of extended limits of jurisdiction, including delimitation of its maritime boundaries with neighbouring States.

With the fast growing economic activities in the Republic of Seychelles it is timely and appropriate for it to consider strengthening the Hydrographic Brigade and setting up the National Hydrographic Service.

REQUIREMENTS

The 7.5m survey launch, provided by SHOM, is only suitable for inshore and harbours surveys and inadequate for surveying the vast areas of exposed waters. The Government must accord priority to undertaking surveys of the Seychelles Bank Plateau, extending over a large area, for which the country needs a vessel of 35-40 metres in length equipped with two survey echo sounders, side scan sonar, data acquisition system, microwave positioning and a GPS receiver. This vessel should have accommodation for 10-12 crew including 3 hydrographic officers and 3 survey technicians with an endurance of 8-10 days at sea. This vessel should be able to hoist and carry the existing survey launch.

It is necessary for the Hydrographic Brigade to obtain the assistance from a qualified and experienced surveyor for at least five years in order to help and assist in planning and carrying out hydrographic work.

As previously stated, it is necessary to establish the Hydrographic Committee and to form a National Hydrographic Service at the earliest opportunity.