

## **THE DEVELOPMENT OF THE BANGLADESH HYDROGRAPHIC OFFICE: AN EXAMPLE OF GOOD USE OF TECHNICAL ASSISTANCE**

by Pierre-Yves DUPUY <sup>1</sup>, M.A. AZIZ <sup>2</sup> and Erwan L'ARVOR <sup>3</sup>

---

The French Naval Company for Training and Advice (NAVFCO) guarantees the transfer of the expertise of the Hydrographic and Oceanographic Service of the French Navy (SHOM) for the benefit of requesting foreign services.

The current HydroBangla project illustrates the transfer of one area of expertise of SHOM, namely, the maintenance of hydrography.

### **HYDROGRAPHY : A NECESSITY IN BANGLADESH**

Bangladesh is situated at the innermost point of the Bay of Bengal on the alluvial plain of the Ganges and Brahmaputra deltas (Fig. 1). In this country, the many arms of the rivers and flooded areas represent so many obstacles to the development of a dense road network. River navigation is, in fact, a preferred mode of transport in Bangladesh.

As a consequence, the Bangladesh ports such as Chittagong and Mongla are the principal points for the country's international commercial exchanges.

Cartographic updating does not only concern the approaches to the ports of Bangladesh. It is also important for the areas surrounding the islands which lie along its coast. The island populations, often faced with difficulties as a result of cyclones and flooding, receive help via the sea, notably from vessels of the Bangladesh Navy bringing medical assistance, food, fresh water and various items of equipment.

<sup>1</sup> Head of HydroBangla Project, NAVFCO, 2, place Rio de Janeiro, BP 49, 75362 Paris Cedex 08, France.

<sup>2</sup> HydroBangla project Officer, BNS Issakhan, New Mooring, Chittagong, Bangladesh.

<sup>3</sup> Head of HydroBangla, SHOM/MHA, CM La Villeneuve, 29240 Brest Naval, France.

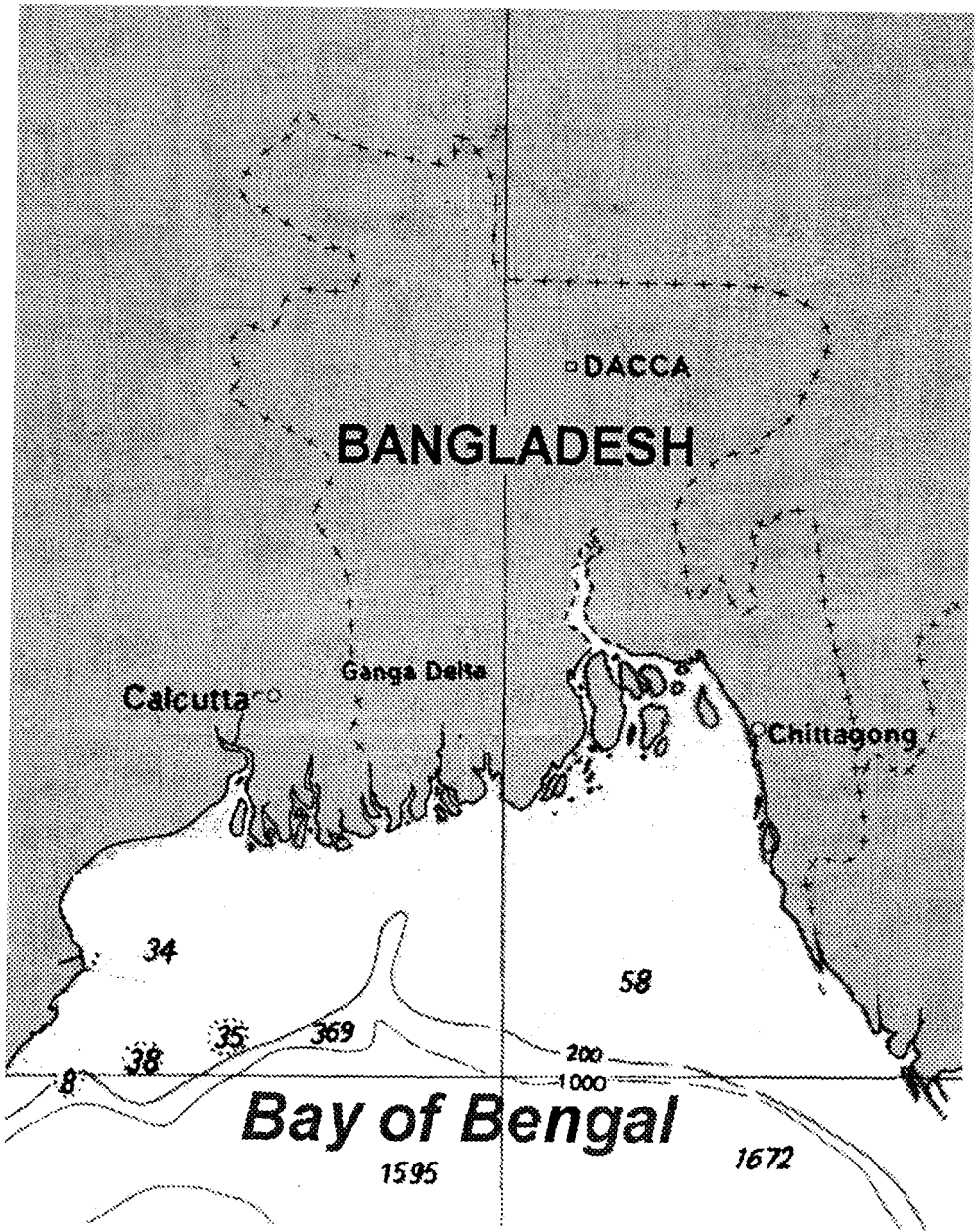


FIG. 1.- Bangladesh.

Moreover, for Bangladesh, which wishes to exploit and manage the wealth contained in and under its waters (fish stocks and natural gas, for example), hydrography is necessary in order to define and establish the legal maritime boundaries of these waters.

Since the country's independence in 1971, the upkeep of hydrography in its rivers and streams is the responsibility of the Bangladesh Inland Water Transport Authority (BIWTA) under the Ministry of Shipping. This Service carries out surveys of areas very close inshore, as required, from time to time.

The Hydrographic Department, created in 1983, is responsible for renewing and maintaining hydrography in the country's maritime waters.

In fact, the maintenance of marine cartography on the coast of the Bay of Bengal is an ongoing activity, since changes to the coastal bathymetry occur very rapidly as a result of the enormous build-up of sediments and alluvial material in the delta, particularly during the rainy season.

To be remembered, too, is the fact that knowledge of the characteristics of the tides and currents remains incomplete for certain points along the coast.

Hydrographic surveys carried out from boats are the only means of updating the bathymetry in the turbid waters which bathe the shores of Bangladesh.

## THE EARLY DAYS OF THE HYDROGRAPHIC DEPARTMENT

Placed under the authority of the Director of Hydrography (DoH), all of the Department's facilities are situated at Chittagong.

The Department's efforts have from the early stages been concentrated upon the training of staff. A hydrographic school was created in Chittagong to train hydrographic survey recorders.

A first officer was trained in France from 1984 to 1988 at ENSIETA,<sup>4</sup> specialising in hydrography-oceanography. Others have taken courses in India and in the United States.

Since 1983, two light landing craft, the BNS DARSHAK and BNS TALLASHI, have been used to carry out hydrographic surveys. These vessels, equipped with RAYTHEON sounders and DECCA positioning receivers, enable some surveys to be made very close to the coast.

<sup>4</sup> L'Ecole Nationale Supérieure des Ingénieurs des Etudes et Techniques d'Armement (Higher National School of Engineers in Studies and Techniques of Armament) trains SHOM's hydrographic engineers (course recognized as Category A by FIG and the IHO). It accepts foreigners with appropriate entry requirements.

Finally, the Chart Depot, responsible for supplying the Bangladesh Navy with nautical documents, has produced a number of original charts based on the surveys carried out.

### THE HYDROBANGLA PROJECT

The HydroBangla Project, master-minded by NAVFCO, began in 1994. The various steps in the first phase, which has just been completed, were as follows:

- Evaluation of needs by SHOM and NAVFCO <sup>5</sup> in 1994,
- Seeking of technical solutions leading to a technical and financial draft plan developed by NAVFCO and approved by the Hydrographic Department,
- Obtention by NAVFCO of funds by the French Government in 1994,
- In 1995, organization of training in France and ordering of the hydrographic equipment to be delivered,
- Receipt of equipment in 1996 and setting up of technical assistance to Bangladesh in May 1996 (with the aim of putting the equipment delivered into operation and training the hydrographic personnel for their jobs),
- Completion of technical assistance in June 1997.

It is also relevant to note that since 1995 two officers have been following courses at SHOM's Hydrographic School in Brest.

### HYDROGRAPHIC EQUIPMENT DELIVERED

In 1996, NAVFCO delivered a large amount of hydrographic equipment to Bangladesh. The principal aim is to be able to carry out hydrographic surveys efficiently and with the necessary precision.

In addition to BNS DARSHAK and TALLASHI, three new rigs have been equipped, namely the BNS SHAIBAL and two work boats.

Thus, NAVFCO has delivered, in all:

- 4 Micrel OSSIAN 100 hydrographic sounders (bi-frequency with digital output),
- 2 Mors SV510 bathyvelocimeters,
- 2 Thomson SMM-II shipboard magnetometers,
- 4 Mors OT660 offshore pressure tide gauges and their operating cages,
- 3 Mors HT200 coastal pressure tide gauges with solar panels,

<sup>5</sup> The project Head responsible for hydrography at NAVFCO is a hydrographic engineer from SHOM.

- DSNP<sup>6</sup> GPS equipment: 2 HF differential GPS stations (range up to 800 km); 3 NDR 200 HF stations with their solar panels, and 5 NR103 receivers allowing positioning to within 2m,
- 2 networks of DSNP AXYLE beacons for positioning close inshore with an accuracy of a few tenths of a metre,
- 4 Cap Gemini HYDROPORT data acquisition systems (each system comprises a PC, the HYDROPORT shipboard software under Windows, an acquisition server with several drives, an indicator of the route to be followed and a printer),
- 4 Cap Gemini HYDROPORT data-processing systems (each system comprises a PC with SCO/UNIX configuration, the HYDROPORT processing software, an A0 or A3 plotter, a digitizing table and a printer).

For carrying out current measurements, the following were supplied:

- Mors MC360 rotor current meters,
- mooring lines (ballast, cable, towfish cables, and buoys).

Finally, two pairs of DSNP NR101 GPS geodesy receivers were delivered, making it possible to fix few position points on the geodetic network maintained by the Survey of Bangladesh (SoB) <sup>7</sup>.

It should be emphasized that NAVFCO takes particular care in defining the contents of the sets of equipment delivered. It is material known to SHOM in general and checked in France with the help of SHOM before being sent abroad. The sets also include major spare parts, all the necessary cables, consumable materials and maintenance tools.

### ON-SITE TECHNICAL ASSISTANCE

Assigned by SHOM to work with NAVFCO, Erwan L'ARVOR and Alexandre GUYOT, hydrographic engineer and hydrographic survey recorder, respectively, made up the technical assistance team present at the Hydrographic Department for one year.

Essential for the setting up of the new material in Bangladesh and for its correct use, the work of this team constituted the core of the first phase.

Based at Chittagong in the premises of the Hydrographic Department, the NAVFCO team provided several types of training for about twenty hydrographers in the following subjects:

- utilisation of the equipment and its maintenance (in respect of certain items of equipment, the manufacturers took part in this training),
- validation of measurements and processing and interpretation,
- preparation, conduct and processing of a hydrographic survey.

<sup>6</sup> Dassault-Sercel-Navigation-Positioning.

<sup>7</sup> The Survey Of Bangladesh (under Defense Secretary) also prints the land maps of the country.

During the period when the training team was present, the Bangladesh hydrographers carried out a hydrographic survey from A to Z using the equipment delivered.

More significantly, the NAVFCO team accomplished advisory tasks as follows:

- making recommendations for the conversion of the minesweeper BNS SHAIBAL into an ocean-going survey vessel (installation of sounders and an air-conditioned processing room, a scientific PC and premises for oceanographic equipment) and for the equipping of the coastal survey vessels BNS DARSHAK and BNS TALLASHI,
- recognizing sites for the implantation of the long-range, HF, differential GPS station and the fixed tide gauges,
- creating a laboratory for the maintenance of the equipment (electronic and computer material),
- fitting out shore premises as data-processing rooms,
- initiating contacts between the Hydrographic Department and various Bangladesh authorities with related activities (ports, BIWTA, SOB, etc.),
- proposing a new organization of the Hydrographic Department.

## HYDROBANGLA PHASE TWO

A new phase of the HydroBangla project, requested by the Hydrographic Department, is now being studied, with the following specific aims:

- creation of a chart-producing facility (delivery of equipment for computer-assisted cartography),
- *creation of a facility for carrying out reconnaissance surveys of recommended navigation routes (delivery of side-scan sonars),*
- modernization of the Hydrographers' School.
- technical assistance with setting up and operation of the new systems delivered.

It should be noted that the second phase will be conducted on the basis of the results of the assistance project which the French National Geographic Institute (IGN)<sup>8</sup> began in 1997 for the SOB.

## EMERGENCE OF A NATIONAL HYDROGRAPHIC SERVICE

In a few years, the Hydrographic Department has appreciably strengthened its capabilities, as a result of:

<sup>8</sup> The IGN is responsible in France for the publication of land maps.

- solid training abroad for young officers destined to make up the Department's senior staff,
- new hydrographic equipment,
- modernized work methods,
- the setting up of a new organization.

Encouraged by this progress, the Bangladesh Government applied for membership of the IHO in 1996 (its representative will be the Hydrographic Department).

The fact remains that the renovation and maintenance of the charting of Bangladesh waters still require a great deal of time and effort in order to elaborate and carry out a hydrographic survey programme, to define a chart production programme, to set up procedures for the management of nautical information on a country-wide scale, to train future generations of hydrographers, to guarantee the maintenance and renewing of equipment, and so on.

The second HydroBangla phase will allow the Bangladesh hydrographers to make progress in these directions, well aware of the task to be accomplished and proud to serve the mariners of their country in this way.

Thus, together with the determination of the Bangladesh authorities and the tenacity of the Bangladesh hydrographers, the HydroBangla aid programme has helped to ensure that the Hydrographic Department is a national Hydrographic Office capable of contributing effectively towards the safety of navigation in the Bay of Bengal and along the Bangladesh coasts.