

CHARTING THE OCEANS

and mapping the maritime interests of the country demand that its coast and the seas around are systematically surveyed and that accurate nautical charts are readily available for facilitating navigation. Navigators need charts for conducting their ships by the shortest and safest route, in most suitable direction. Nautical charts are also required for port development schemes, coast erosion and oceanographic research.

Probing unknown depths has been the mission of hydrographers for centuries so that every hidden danger lurking beneath the surface of the sea could be revealed and navigation made safer. All information laboriously and systematically collected by the surveyor is continuously published in the form of navigational charts and nautical publications available for mariners, so that they may sail the seas with confidence.

Hydrographic charting, i.e., charting of lakes, rivers and seas is the art of science of compiling and producing charts of the water-covered areas of the earth's surface, whereas hydrography itself is the science dealing with all the waters of the earth's surface, including the description of their physical features and conditions. Hydrographic charting thus involves the vital task of preparing charts showing positions of lakes, rivers and seas, the contours of the seabed, the positions of shallows, deeps and reefs and the direction and volume of currents, whereas hydrography is confined to a scientific description of the position, volume, configuration, motion and condition of all the waters of the earth. The word *chart*, as is known, has been derived from the French *Charte* and the Latin *Charta*, meaning a card.

The Indian Hydrographic Department is as old as the Navy itself. It has its roots deep into the past. It is one of the oldest surveying organisations of the country and has worked under different names in different periods. One of the earliest of the famous race of Indian Marine Surveyors was Captain John McCluer. The general accuracy with which he surveyed a considerable part of the coast of India, entitles his work to be regarded as amongst the best charting undertaken in these waters. In the year 1787, McCluer commenced systematic surveys of the west coast of India. In the conduct of these surveys he was guided by the following instructions issued by

the East India Company: 'Let what is done be done completely and nothing left undetermined in this space; if any doubt arises, let the observations be repeated in such part, that an implicit confidence may be placed in the work when finished'.

Captain Daniel Ross, the well known hydrographer of the Indian Navy, is called the father of the Indian surveys. He, indeed, introduced scientific methods of surveying. Ross commenced surveys in the China seas in 1806. He surveyed the Paracel Islands and the nearby shoals, the coast of Canton Province, the Islands of Formosa and Borneo, the Straits of Malacca and a portion of the Philippines. He did his work with great care and regard to scientific accuracy and based his surveys on trigonometric control. His triangulation was often verified by astronomical observations. These surveys, though made more than a century and a half ago, with inferior instruments, and at a time when the science of hydrography was in its infancy, show surprising accuracy and attention to detail.

Till the early fifties, results of hydrographic surveys carried out by the surveying ships were forwarded to the British Hydrographic Department (Admiralty), the then pioneer institution in the science of hydrography, which undertook responsibility for the production of nautical charts and ancillary publications for the Indian waters. Experience showed that this arrangement was unsatisfactory particularly keeping in view the overall maritime interests of the nation. It was, therefore, decided to establish the Hydrographic Office in India for undertaking these tasks. This office is a technical establishment and is staffed by professional hydrographic surveyors, nautical cartographers and printing personnel, all of whom are qualified in the special skills required of them.

After considering many sites, it was decided to establish the office at 'Dehradun, where the printing facilities of the Survey of India could be utilised and close liaison between the two premier survey departments maintained, for exchange of survey data. The proximity of Survey of India also proved useful in obtaining services of experienced cartographic officers and draughtsmen on deputation to meet the immediate requirement. The Naval Hydrographic Office was established at Birpur, Dehradun on June 01, 1954 and shifted to its present location on Rajpur Road, Dehradun on March 29, 1957. Meanwhile, the Hydrographic Surveying Service which in the beginning of 1950 was known as the Marine Survey of India and was headed by a hydrographic surveyor designated as 'Surveyor-in-Charge', Marine Survey of India was changed to Naval Hydrographic Office on August 15, 1954 and the designation to The Chief Hydrographer. Later, the post of Chief Hydrographer was redesignated as The Chief Hydrographer to the Government of India, as the Hydrographic Branch was not only working for the Navy but was also the sole national authority for the production of nautical charts and publications essential for the development of the country. The Naval Hydrographic Department was fully nationalised in 1955 with the appointment of Captain (later Admiral and the Chief of the Naval Staff) J. Cursetji as Chief Hydrographer to the Government of India.

Acquisition of Surveying Ships/Equipments

The most famous name of a Survey Ship in Indian Hydrographic history is that of the ship *Investigator*. The fifth successive *Investigator* converted from a River class Frigate *Kukri*, carried out the major surveying duties in the post independence period. However, keeping in view, the task that lay ahead for revision of surveys of the entire Indian coastline, measuring approximately 6000 nautical miles, several major and minor ports and to meet the urgent requirement of shipping, *Rohilkhand*, a minesweeper, was converted to carry out surveying duties from 1952-54. In 1953, the frigate *Sutlej* (1300 tons) was converted into a surveying ship and joined the surveying service in place of *Rohilkhand*. Another frigate *Jumna* (1300 tons), later spelt as *Jamuna*, was also converted and commissioned as a surveying ship on November 15, 1956. The first Indian-built hydrographic ship *Darshak*, fully air-conditioned and with accommodation for 22 officers and 272 sailors, equipped with two 35 feet survey launches, three motor boats fitted with echo-sounders for sounding and a helicopter for aerial photography and survey reconnaissance, was commissioned by Vice Admiral B.S. Soman, the then Chief of the Naval Staff, on December 28, 1964. The techniques of surveying took a quantum leap with the advent of electronics in the surveying service during 1962 when Tellurometers were introduced for distance measurements. In 1963, electronic position fixing system (Hi-Fix equipment) was acquired to increase efficiency and positional accuracy in surveying. This system, to a large extent, replaced the conventional position-fixing method.

Hydrographic Training

Since no specialised training facilities were available in India till the late 1950s, personnel were deputed to foreign hydrographic offices for training. In order to attain proficiency in hydrography however, an extensive, systematic and planned training in various facets was essential. Keeping this in view, a Hydrographic Training Unit was set up at the Naval Chart Depot, (*Angre*) Bombay, in 1959 under the administrative control of the Commodore-in-Charge, Bombay. This Unit was primarily meant for training junior officers and sailors as well as a few civilians of hydrographic organisations of maritime states and ports of India. However, the Naval Hydrographic School was sanctioned and established in the premises of the Navigational & Directional School, *Venduruthy*, Cochin and commenced functioning from September 21, 1961. The number of surveying offices was 19 in 1954, 27 in 1959 and rose to 32 in 1965.

Cartographic Training

As in the case with any new scheme, it was difficult to get trained technical personnel for the Naval Hydrographic Office, Dehradun. To overcome the situation, one Chief Instructor Officer, who volunteered to become a Civilian Hydrographic Officer (CHO) was trained for a year at the British Hydrographic Department. On his return to India in 1956, he was appointed as the first Principal Civil Hydrographic Officer (PCHO). The services of two surveyors were requisitioned from the Survey of India in 1957 and appointed as Civilian Hydrographic Officers. These personnel were organised on the same model as the British Hydrographic Department. Three Civil Hydrographic Assistants were recruited in 1959 and were imparted training at Dehradun, in the production of nautical charts and on board the surveying ships in the conduct of hydrographic surveys. On December 31, 1965,

a total of nine civilian Hydrographic Officers and civilian Hydro-graphic Assistants were available in the Naval Hydrographic Office, Dehradun.

National and International Activities

On April 01,1956 India became a member of the International Hydro-graphic Organisation (IHO), an intergovernmental body of hydrographers, which has its Headquarters at Monaco (Monte Carlo). The IHO endeavours to standardise navigational charts and publications on a common format so that mariners of the world can use the charts without doubts or ambiguity. IHO holds its conferences every five years. Captain J. Cursetji attended the 7th International Hydrographic Conference in 1957.

distinction or nothing — --* — '~*~i~tu-TA*_nr_nhar<t_ have had
the following appointments at Monte Carlo:
(a) Rear Admiral D.C. Kapoor, Director, International Hydrographic Bureau -1972 to 1982

(b) Rear Admiral F.L. Fraser. President Director Committee.

tional Hydrographic Bureau -1982-87.

Hydrographic Surveys

Hydrographic surveys for the purpose of charting Indian and adjoining waters include areas not only in the coastal belt along peninsular India but also the waters in and around the Laccadives and the Andaman and Nicobar group of islands.

During the period 1950-65 about 5000 Square Sea Miles of soundings and about 1500 miles of coastlining were carried out by the surveying ships operating around the Indian peninsula. The following is the chronological list of hydrographic surveys carried out during this period.

1951-52

(a) Gulf of Kachchh - Mandvi and Kanwara shoals

1952-53

- (a) Gulf of Kachchh
 - Mandvi to Navinar
 - Godia Creek
- (b) Gujarat Coast
 - Karanja Island
- (c) Maharashtra Coast
 - False Point
- (d) Orissa Coast
 - (Approaches to Mahanadi river)
 - Mahanadi River - Northern Entrance
 - Mahanadi River - Southern Entrance
 - Port Blair
 - Kori Creek

1954-55

- (a) Port of Bombay
- (b) Approaches to Bombay Harbour
- (c) Andaman Islands - FJphinstone Harbour
- (d) Andaman Islands - RongatBay

1955-56

- (a) Port of Bombay - Southern & Northern portion
- (b) Tuticorin Roadstead & Harbour
- (c) Pondicherry
- (d) Approaches to Madras
- (e) Madras Roadstead

(f) Andaman Islands

(g) Nicobar Islands

(h) Gulf of Cambay

2956-57

(a) Gulf of Kachchh

(b) Gujarat Coast

(c) Kerala Coast

(d) Kerala Coast

(e) Kerala Coast

(f) Tamil Nadu Coast

(g) Andhra Coast

(h) Andhra Coast (i) Andhra Coast (j) Approaches to

Vizagapatnam - (Vishakhapatnam)

(k) Vizagapatnam (Vishakhapatnam) Harbour

(l) Andaman Islands - Middle Strait to Shoal Bay

The first navigational chart of Elphinstone harbour and Approaches was published by the Naval Hydrographic Office on January 15, 1959 based on data collected by our ships in Andamans; 28 modern navigational charts were published until 1965.

The Hydrographic Department of the Indian Navy essentially serves the needs of mariners and defence but in no less a measure, the interests of agencies engaged in the exploration and exploitation of the marine resources in our ocean zone. As time goes on, the responsibilities of surveyors will increase with the developing emphasis on oceanographic science. Personnel engaged on survey duties invariably spend nearly eight months of the year at sea, working on many occasions in uninhabitable environments for long periods. There is a specialisation requiring considerable perseverance and dedication in an unobtrusive manner.

The three arms of the Indian Navy, the surface, the naval air and submarine are quite well known; the fourth, 'hydrographic dimension' though as old as the Navy itself, keeps a low profile but a continuous silent activity of the silent service.