



100 YEARS OF INTERNATIONAL COOPERATION IN HYDROGRAPHY

ROLE OF SL NAVY HYDROGRAPHIC SERVICE

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The vast ocean is a vibrant frontier with its own marine ecosystems. Being an island nation Sri Lanka is duly embellished with her own share of oceanic resources. Today we discover the importance of hydrography and the role of the Navy Hydrographic Service.

Basically hydrography comes from the word hydro meaning water, and graphy meaning to write. Hydrography is a science that measures and describes the navigable areas of the oceans, lakes and rivers. In the early days, mariners sailed with limited information. It is recorded that in 1795, the British Admiralty appointed Alexander Dalrymple as the first hydrographer of the Royal Navy. The first navigation chart was printed in 1800.

In order to gain some deeper insight into this naval branch, I visited their main Hydrographic Service Office, located in Crow Island, within the compound of the National Aquatic Resources Research Agency (NARA). Many people know that NARA has been engaged in its own research of oceanic and marine related topics. I met up with Commander (H) Sunanda Appuhamy, Director - Human Resources and Training. According to the naval officer, hydrography covers an extensive process of measuring, tabulating and analysing data that subsequently manifest into charts and information used by all sailing ships, harbours and all those who have some connection to the vast oceans that



RV Samudrika

surround almost 75 percent of the world's mass.

Commander Sunanda explained "The origins of hydrography in Ceylon can be traced when the Royal Ceylon Navy did a hydrographic survey in 1962 for the Pulmoddai Mineral Corporation. Later in 1970, a hydrographic survey was conducted to chart the approach to Kayts Island. In 1976, naval hydrographers completed a survey and charting of the India-Ceylon maritime boundary."

In the early stages of this meticulous task, many countries in the world used the lead line survey method and three-point Sexton fixes; horizontal sexton angles done manually to measure and chart the depth of the ocean bed. Height, location and depth are precisely measured in hydrography. Later in 1870, a piano-wire sounding machine came into use, invented by William Thomson. This was said to be faster than the old rope system. By 1919, the single beam echo sounder (also called a

fathometer) was introduced to augment this process at sea. This system was advanced to a multibeam echo sounder.

A few years later, side scan sonar began to dominate the process of measuring seafloors. In the past years, hydrographic services were enriched with the development of the LiDAR system (Light Detection and Ranging) which uses water penetrating lights (red and green). The ultimate aim of hydrographic services is to facilitate safe navigation at sea. In the extensive process, it can take weeks for the hydrographic survey to get information on navigation, topography and composition of the terrain. Just like on land, the sea bed has its own ocean ridges, ocean trenches, rock formations and the unique coral bed that supports various marine life forms.

Commander Sunanda added: "Each country has its demarcated boundaries at sea. For Sri Lanka from the baseline we have 12 Nautical Miles of territorial waters. The

next 12 Nautical Miles (24 Nautical Miles from the baseline) is what we call the Contiguous Zone. Finally, we have our Exclusive Economic Zone (EEZ) which extends 200 Nautical Miles from the baseline. This area is the deep sea. It is this EEZ sea area that is patrolled by the Advanced Offshore Patrol Vessels (AOPV) and Offshore Patrol Vessels (OPV) of the Sri Lanka Navy. We have made submissions for the Continental Shelf Claim, which further enhances the sea area for our beautiful island nation."

At present, NARA owns a research vessel named RV Samudrika, which is fully manned by a naval crew. The RV Samudrika is equipped with many facilities, including wet and dry lab to conduct oceanographic research and hydrographic survey whilst sailing at sea.

As the Sri Lanka Navy was engaged heavily in the period of conflict, the hydrographic task was delegated to NARA in 1983. In 2012, the Navy began its Hydrographic Service after a lapse of many years. Presently, the Sri Lanka Navy has a Hydrography School located within the Naval and Maritime Academy, Trincomalee. At this school, sailors learn and become qualified in hydrography. Naval officers who specialise in hydrography can augment their skills with overseas training leading to a Master of Science degree in this field. At present, there are 38 officers and 106 sailors attached to the Navy Hydrographic Service. Sri Lanka is a member of the International Hydrographic Organization (IHO), which is divided into 15 regions across the world. The IHO was established on June 21, 1921. The IHO



has 94 Member States. For administrative purposes, Sri Lanka reports to the North Indian Ocean Hydrographic Commission. Interestingly the present Chairman of this commission is Rear Admiral Y.N. Jayaratne, who is the Chief Hydrographer of the Sri Lanka Navy (and also Joint Chief Hydrographer to the Sri Lankan government). The vision of the Sri Lanka Navy Hydrographic Service is to provide quality hydrography data in support of decision making towards sustainable development, protection and safe use of the Sri Lankan maritime domain.

We walked around the large office where officers and sailors were at work. Some were processing data on computers. Others were busy making

digital charts. With global advances in the maritime industry, many countries have switched to Electronic Navigation Charts (ENC), replacing the large printed paper charts used for many decades. It is the global practice that all merchant ships using these ENCs pay in US dollars for each cell of a navigation chart. Given the flow of so many ships passing each harbour, any country can gain massive revenue if these Electronic Navigation Charts are done and updated by them. Detailed hydrographic charts not only guide ships at sea but even give precise details of the seabed terrain, whereby a captain can decide where to cast the ship's anchor.

The vital information obtained by naval hydrography is used to plan and model harbours, decide on port engineering, coastal zone protection and even in times of natural disasters to plan the deployment of rescue vessels. For example, before building a new harbour, naval personnel measure and monitor the pattern of wave height which is a vital factor in the harbour design. Naval hydrographic data naturally becomes a vital part of national security, which is why a majority of countries assign the task of hydrographic charting to their navies. These charts can be used for defence charting, national charting and commercial charting.

In addition to these duties the Navy has a tide monitoring duty since 2015. This manual task is done by sailors using a tide pole, during rain or sunshine. It presently takes place in Hambantota, Colombo, Trincomalee, Kankesanthurai (KKS), Delft Island and Kalpitiya. Charting is not only restricted to the sea but also covers inland waters (lakes and rivers). The officers and sailors of the Sri Lanka Navy Hydrographic Service have done a silent yet important service to the nation.

