





# NATIONAL HYDROGRAPHIC OFFICE

# OF

# **SRI LANKA**



# NATIONAL REPORT TO THE 21<sup>ST</sup> MEETING OF THE NORTH INDIAN OCEAN HYDROGRAPHIC COMMISSION 22-25 AUGUST 2022

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#### 1 Introduction

The National Hydrographic Office [NHO] of the government of Democratic Socialist Republic of Sri Lanka was established in 1984 under the purview of National Aquatic Resources and Research Agency [NARA]. The National Hydrographic Office has been currently vested with the responsibility of conducting country's Hydrographic and Nautical Charting operations by NARA Act of No. 54 of 1981 as amended by Act No. 32 of 1996.

At present, the NHO is jointly administered by Sri Lanka Navy Hydrographic Service [SLNHS] and NARA, having entered into an MOU in 2016 in order to expedite national hydrographic operations which is demanded by SOLAS regulations. This has enabled joint Hydrographic surveys and expedited updating of existing nautical charts around the country and paved the way for an efficient development in providing of Hydrographic services within the waters of Sri Lanka during the recent past. In addition, this amalgamation has shown a remarkable progress in the field as the same has facilitated to share resources and professionalism to achieve common goals. Thereby, today the NHO of Sri Lanka has been able to complete long outstanding survey requirements within a very short span of time. The principle services of the NHO include conducting of systematic Hydrographic surveys for national, defence and commercial requirements. Further, NHO produces and disseminates information in support of coastal zone management, exploration of exploitation of marine resources, environmental protection and management, maritime boundary delimitation, port development, inland water management projects etc.

# 2 Surveys

Hydrographic surveys, which are conducted by NHO within the waters of Sri Lanka, are a joint effort of the Sri Lanka Navy Hydrographic Service [SLNHS] and the National Hydrographic Office of NARA. Apart from the said surveys, SLNHS conducts defence surveys in support of naval operations in the country.

# 2.1 Coverage of New Surveys

Sr.No.	Name of the Chart	Scale Band	Remark
01	Colombo to Negombo	3	In progress
02	Approaches to Colombo	4	-do-
03	Colombo to Weligama	3	-do-
04	Colombo to Sangamankanda	3	-do-
05	Trincomalee to Kudiramalai	3	-do-
06	Little Basses to Trincomalee	3	-do-
07	Approaches to KKS	4	-do-
08	KKS to Delft	4	-do-
09	Mannar Island	4	-do-

Presently, few surveys are being carried out to produce coastal and approaches charts as indicated in table 1.

The National Hydrographic Office of Sri Lanka, improves safety at sea, increases the protection of the marine environment and advances national development leading for more efficient and safe maritime transport. The economic benefits gained by operating the Norochcholai coal power plant are vital for the development of Sri Lankan power sector and have a significant positive effect on the national economy. By considering the contribution to the national economy of the country, the nautical chart of Puttalam Harbour for Norochcholai coal power plant was produced including the identified barge channel for the coal transportation to the power plant.



Figure 1: Nautical chart of Puttalam harbour

In addition to the above new surveys, NHO and SLNHS have involved in bathymetric surveys providing consultancy services to local institutes such as Department of Coast Conservation and Coastal Resources Management, Sri Lanka Ports Authority, Ceylon Fishery Harbour Corporation, China Harbour Engineering Company limited, National Aquaculture Development Authority etc.

#### 2.2 Problems Encountered

Most of the hydrographic survey activities and capacity building activities were affected due to existing Covid-19 pandemic and survey calendar had to re-arrange as per the new normal. In addition, NHO requires enhancing capacities in maintaining its new chart portfolio when it is completed. Accordingly, it is required to work on preparation and publishing supporting nautical publications including Sailing Directions, List of Lights, and Tide Table etc. covering its waters.

# **3** New Charts and Updates

# 3.1 ENCs

Table 2 provides details of ENCs currently published /in progress of production after fresh hydrographic surveys.

Sr.No.	Scale Band	Cell No.	Area	Remarks
01	5	LK5G16C3	KKS Harbour	Published
02	5	LK5G03D4	Colombo Harbour	-do-
03	4	LK4PG16C	Approaches to KKS	In progress
04	1	LK4PG03D	Approaches to Colombo	-do-
	4		Harbour	
05	5	LK5G04A1	Galle Harbour	-do-
06	4	LK4PG04A	Approaches to Galle Harbour	-do-

#### Table 2: Details of ENC production

At present, the SOLAS requirement of maintaining up to date nautical products within the waters of Sri Lanka is met by UKHO under a bilateral arrangement. However, it is envisaged that NHO in collaboration with UKHO and other supportive hydrographic offices will develop capacities towards producing its own ENCs and INT charts for entire area of Sri Lankan waters within next couple of years. Accordingly, Sri Lanka has produced 05 LK ENCs.

Production of Colombo Harbour ENC (LK 5G03D4) is one of the major achievements of SLNHS. UKHO has announced the acceptance of Colombo Harbour ENC while withdrawing BA ENC cell w.e.f August 2022.



Figure 2: Electronic Navigation Chart of Colombo harbour

# 3.2 INT Charts

Sri Lanka has not produced any INT charts yet. However, NHO is planning to produce new INT chart for Approaches of Colombo and Colombo Harbour, Hambantota Harbour and Approaches and Colombo to Weligama on completion of joint survey with Indian Hydrographic Department and other on-going surveys.

# 3.3 National Paper Charts

The nautical chart of Puttalam harbour was published by including the harbour limits of Puttalam harbour as its gazetted.

# 4. New Publications and Updates

Nil.

# 5. Maritime Safety Information [MSI]

MSI	Y/N	Comments on MSI:
Local warning	NO	NAVAREA warnings disseminated
Coastal warning	NO	through India being NAVAREA VIII
Nav warning	NO	coordinator
Port warning	NO	
GMDSS	Y/N	Comments on GMDSS:
Master Plan	NO	
Area A1	NO	
Area A2	NO	
Area A3	NO	
NAVTEX	NO	
SafetyNet	NO	

# Table 3: Details of Maritime Safety Information

# 6. C-55

The updated C-55 table is attached as Annex 'A' to this report.

# 7. Capacity Building

# 7.1 Training Received

Since the last NIOHC, following training opportunities have been received from regional navies and through IHO Capacity Building programme.

SR.	Name of Training	Sponsored by	Country	Duration	No. of
No					berths
1	CAT "A" Hydrography	Indian Navy	India	44 weeks	02
2	Advanced Hydrography	UKHO	UK	26 weeks	01
	Course				

3	CAT "B" Hydrography	Bangladesh	Bangladesh	23 weeks	02
		Inavy			
4	Training module on	UKHO	Sri Lanka	02 Weeks	05
	Electronic Navigation				
	Charts				
5	Survey Recorder I	Indian Navy	India	20 Weeks	02
6	Survey Recorder II	Indian Navy	India	10 Weeks	03
7	Survey Recorder III	Indian Navy	India	16 Weeks	02
8	Cat "A" Hydrography	Nippon	USA	44 weeks	01
		Foundation			
9	Geo spatial Information	Indian Ocean	Mauritius	01 week	01
	Technology for Disaster	Rim			
	Risk Management	Association			

Table 4: Training received from 2021-2022

#### 7.2 Training Provided

Sri Lanka Navy Hydrographic School was established in 2014 and since then, has provided one Survey Recorder III course annually. From 2016 onwards, one Survey Recorder II course for the sailors of Sri Lanka Navy Hydrographic Service.

In addition, SLNHS conducts lectures on Hydrography for students of University of Ruhuna, University of Uva Wellassa and Southern Campus of Kothelawala Defence University, Ocean University to cover theory and practical aspects in their degree programmes.

Also, Faculty of Geomatics, Sabaragamuwa University of Sri Lanka is conducting 4 year degree programme in Surveying Sciences and the expertise of NHO conduct lectures for students who are specialized in Hydrography in the said degree programme including six months industrial training programme at NHO. The programme is accredited as FIG/IHO/ICA Category B in Hydrography and RICS.

#### 7.3 Training Needs

Sri Lanka expects capacity building on following aspects to meet future objectives of the field of hydrography through NIOHC and IHO Capacity Building Fund:

- a. CAT 'B' Cartographic Training
- b. CAT 'A' and CAT 'B' Hydrography training
- c. Cartographic training for production of ENCs, AMLs & Paper Nautical Charts and their maintenance
- d. Training and capacity building on MSI
- e. Training and capacity building on MSDI
- f. Joint surveys in SL waters with MB / LIDAR surveying and processing capabilities

#### 8. Oceanographic Activities

Oceanographic activities were focused on enhancing ocean observation, prediction and forecasting. In addition, scientific and technological services, including feasibility studies and environmental impact assessments (EIA) were provided to a wider range of applications such as coastal constructions, living and non-living resource exploitation, and ocean energy harnessing. Further, assessment and monitoring of environmental impact due to the MV 'X' Press Pearl maritime accident off the west coast of Sri Lanka was conducted. In addition following Oceanographic activities were conducted by NARA.

#### 8.1 Tide Gauge Network

Sri Lanka Navy Hydrographic Service is maintaining 07 manual tide monitoring stations at Colombo, Kalpitiya, Delft Island, KKS, Trincomalee, Galle and Hambantota with an archive of tide data since 2015 in order re-establish Mean Sea Level of the Chart Datum around Sri Lanka.

National Aquatic Resources Research and Development Agency (NARA) commissioned two automated sea level station, Point Pedro (Northern coast) and Krinda (Southern coast), in addition to the three sea level stations operating in West (Colombo), South (Mirissa) and East coasts (Trincomalee). Point Pedro (North) and Mirissa (South) stations are fitted with meteorological sensors (atmospheric temperature and pressure, humidity, wind direction and speed). Satellite Colombo (West) and Trincomalee (East) data is transferred via satellite, while others use GPRS for data transfer.

#### 8.2 Offshore sand exploration

National Institute of Oceanography and Marine Sciences had conducted Sub-bottom profiling, Side Scan survey and Grab sampling on the Continental Shelf of Southwestern (Dodanduwa, Galle and Weligama) and Eastern (Trincomalee) Coast of Sri Lanka. The purpose of the survey was to identify potential offshore sand reserves for construction industry.

#### 9. Other Activities

#### 9.1 Participation for IHO meetings

Due to COVID - 19 pandemic situations, none of the members of the NHO were attended for IHO meetings.

#### 9.2 Coastline Re-confirming Project

Sri Lanka Navy Hydrographic Service and Survey Department of Sri Lanka collaboratively conducted coastline survey in re-confirming the coastline of Sri Lanka and its Islands.

# 9.3 Submission to CLCS

NHO provides expertise and Hydrographic assistance to National Ocean Affairs Committee [NOAC] in pursuing of submission forwarded to the Commission on the Limits of the Continental Shelf [CLCS] for extension of outer continental margin of Sri Lanka.

# 9.4 Conducting VTC discussion sessions with Member States of NIOHC

Due to pandemic situation, physical meetings with Member States within NIOHC were affected. Therefore, Sri Lanka being NIOHC chair arranged monthly VTC training sessions on hydrography related topics to enhance the knowledge and working capabilities of Member States of NIOHC, which appreciated by all the Member States of NIOHC.

# 9.5 Spatial Data Infrastructure

Ministry of Defence currently maintains data repository with respect to hydrographic and oceanographic data of the country. Online portal for MSDI has launched on 25<sup>th</sup> February 2022 under the web address of <u>https://msdi.navy.lk/</u>



# Figure 3: Online portal for MSDI

However, data is available for government organizations on demand as per availability. National Hydrographic office of NARA is already maintaining the database including the available bathymetric and shore profile information with the relevant metadata since 1996.

#### 9.6 Sea Bed 2030

NHO has been conducting project on establishment of database and online data processing unit for crowd sourced bathymetry parallel with the Seabed 2030 global mapping project of GEBCO/Nippon Foundation.

The spatial database interface was created using ArcGIS platform and model of the surface was created. Crowd sourced bathymetry from the RV "Samuddrika" cruise track data and the bathymetric data from systematic surveys of NHO, bathymetric data from the admiralty charts were associated to the database.



Figure 4: Crowd sourced bathymetry from the RV "Samuddrika"

# 9.7 Innovations

Having pooled resources of SLNHS and NARA, the NHO utilizes state of the art modern technologies, equipment and software applications to conduct surveys and produce nautical charts. Furthermore, the research activities relevant to the hydrography and ocean sciences are conducting by using the sonars, GNSS and remote sensing technology.

#### 9.8 Consultancy and other Research Projects

a.	Survey at Anawilundawa sanctuary for Mangrove restoration Wildlife conservation	on - Department of
b.	Bathymetry survey at Hambatota fishery harbour -	Ministry of Fisheries
с.	Investigations of sand borrow area Off Rathmalana - and Coastal Resources Management Department	The Coast Conservation
d.	Demarcation of areas in the sea cucumber export village - Aquaculture Development Authority (NAQDA)	The National
e.	Volumetric calculation of Inland water bodies -	Ministry of Fisheries

#### 10. Conclusion

The current development of Covid-19 pandemic around the world had greater impact on hydrographic world and Sri Lankan survey activities were also greatly affected by the pandemic. However, with the joint collaboration with NARA and SLNHS, NHO is striving to carryout Hydrographic surveys for coastal charts and ENC productions amidst budgetary constraints to provide updated nautical information for marines and keep in pace with acquisition of modern skills such as developing MSDI, CSB, developing capacity for ENC production, deriving shallow water bathymetry by using high resolution satellite imageries and evaluating existing charts for adequacy, database preparation with crowd sourced bathymetry. Even within this pandemic period, the officers of NHO are engaging to absorb the latest knowledge and technology through the national and international training programs and online courses. As well as the research projects are also moving forward. In this endeavour, NHO Sri Lanka seeks collaboration of regional Hydrographic offices through NIOHC in achieving its future goals and objectives in view of providing professional Hydrographic services to its stakeholders.