



SAIHC16-15.1B



COUNTRY REPORT - MAURITIUS



16th MEETING OF SOUTH AFRICAN ISLANDS HYDROGRAPHIC COMMISSION

Cape Town, South Africa
(2 - 5 September 2019)

1. **Executive Summary**

1.1. **Name of the Institution** - Mauritius Hydrographic Service (MHS), under the aegis of Ministry of Housing and Lands

1.2. **Introduction**

Mauritius is an Island nation of approximately 2040 sq. km. situated 20° South of the Equator and on longitude 57.5° East. Mauritius is a maritime state with a large Exclusive Economic Zone (EEZ) of around 2.3 million square kilometres. In addition, an area of 396,000 square kilometres of seabed in the Mascarene region is jointly managed by the Government of Mauritius and Republic Seychelles as endorsed by the United Nations Commission on Limits of Continental Shelf in 2011. Mauritius being signatory to International Maritime Organisation (IMO) Convention of Safety of Life at Sea (SOLAS) has national and international responsibilities to provide necessary services for enhancing safety of navigation in its area of jurisdiction. For the exploration and exploitation of the potential marine resources, systematic data collection is being carried out in the surrounding ocean. Significant milestones have been achieved since the inception of MHS in 2013 in the field of Hydrography. The unit interacts on a regular basis with national as well as international agencies on the matters related to Hydrography.

1.3. **Cooperation between India and Mauritius**

A Memorandum of Understanding (MoU) between Republic of Mauritius and Republic of India in the field of hydrography was signed on 24 October 2005. The MoU provides for cooperation in the field of hydrography between the two countries and assistance in production of navigational charts, training of staff and expertise for setting up of hydrographic infrastructure in Mauritius. Twelve Joint bilateral Indo- Mauritian Committee meetings on Hydrography have been held since 2006. Through the Joint Surveys undertaken with the Indian Naval Hydrographic Department a total of 28

hydrographic surveys have been completed in the last Thirteen years. This has led to the production of 08 navigational charts and 10 ENC cells.

1.4. **Hydrographic Infrastructure.** Mauritius Hydrographic Service under the Ministry of Housing and Lands is the nodal agency for hydrographic surveying and nautical charting in Mauritius. Over a period of time, MHS has developed the capacity to survey areas critical for shipping and surface navigation, carry out underwater search operations for wreck/ obstruction detection and survey extremely shallow lagoons surrounding the mainland and outer islands for supporting economic/ tourism related activities and is now working towards attaining medium and deep sea survey capability. In addition, significant progress has been made towards hydrographic support for scientific research & disaster management, physical modelling, sale of updated nautical products and developing expertise in matters related to maritime domain. Mauritius Hydrographic Service is also collaborating with Department of Continental Shelf, Maritime Zones and Administration for implementing GIS Platform for Marine Spatial Planning. The expansion of the services is currently being pursued with a firm roadmap for the future. The main areas of focus are as follows:-

- (a) Enhance the capability in terms of equipment and manpower to provide hydrographic support to outer Islands of Rodrigues and Agalega as and when required.
- (b) Develop marine cartography capability through capacity building programmes.
- (c) Integrate MSI infrastructure in Mauritius with NAVAREA warning services.
- (d) Establish maintenance and support procedure for hydrographic equipment to ensure sustained availability for operations.
- (e) Fulfilling deep sea survey requirements through international collaboration.

(f) Procurement of modern equipment like Portable Multi Beam Echo sounder and Acoustic Doppler Current Profiler for enhancing the scope of Hydrographic surveys being carried out by the unit.

(g) Upgrading the current Hydrographic data processing software suite to handle complex data from advanced survey equipment.

1.5. **Submitted by:**

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2. **Surveys**

2.1. **Coverage of New Surveys.** The major surveys carried out since the last one year are enumerated below:-

(a) **Le-Morne Brabant.** A new Chart was schemed which required fresh surveys to be undertaken off Le-Morne Brabant. It is pertinent to mention that the entire survey beyond the lagoons has been undertaken using Multi beam Echo sounder to ensure 100 % coverage by Indian Naval Surveying Ship Sarvekshak. The lagoon areas have also been adequately surveyed using shallow water boats. The new navigational chart would be published at a scale of 1:10,000.

(b) **Rodrigues Island.** The Hydrographic Survey of waters around Rodrigues Island has been undertaken using Multi Beam Echo Sounder by Indian Naval Ship Sarvekshak. This would pave

way for the publication of a new chart of Rodrigues which would replace the vintage BA Chart 715 published in 1876.

(c) **Surveys of Poudre d'Or.** Surveys off Poudre d'Or have been undertaken to facilitate navigation inside the lagoon. The entire survey beyond the lagoons has been undertaken using Multi beam Echo sounder to ensure 100 % coverage by INS Sarvekshak.

(d) **Anse La Raie.** Multi Beam survey off Anse La Raie has been undertaken by Indian Naval Ship Sarvekshak.

(e) **Surveys at Rodrigues.**

Apart from the survey of Port Mathurin Harbour undertaken at a scale of 1:12,500, bathymetric data in 6 Oyster, Algae and Sea Cucumber sites was collected for the benefit of Commission of Environment, Rodrigues Regional Assembly and Continental Shelf Maritime Zone Administration and Exploration.

(f) **Port Louis Harbour.** Port Louis is a major harbour of Mauritius. A detailed check survey was undertaken by MHS last year. Based on the survey, new edition of Port Louis Harbour chart was released on 01 November 2018.

(g) **Surveys for Beach Authority.** The Beach Authority had requested to undertake surveys in order to demarcate swimming zones for the safety and security of the beach users. The beach authority has projected a requirement to survey 26 Beaches out of which 06 have been surveyed so far. The surveys are being undertaken on progressive basis.

(h) **Survey off Deux Freres.** National Coast Guard (NCG) is responsible for law enforcement at near and high seas surrounding Mauritius. The organization is in process of enhancing capabilities to timely prevent any illegal activities at sea. In order to facilitate

navigation in lagoon of Deux Freres for deeper draughts NCG crafts, a hydrographic survey of off Deux Freres was requested by the National Coast Guard. The survey for National Coast Guard has been completed in July this year.

(i) **Survey of Fouquets Island to Ile De La Passe.** The survey of Fouquets Island to Ile De La Passe was undertaken to comply with the request received from the Ministry of Tourism. The data collected during the course of survey would be useful to the numerous pleasure crafts, catamarans and yachts plying in the area.

(j) **Survey of GRSE Cultural Heritage Site.** Department for Continental Shelf, Maritime Zones Administration and Exploration (CSMZAE) in collaboration with Stanford University requested MHS to undertake side scanning operations off Grand Port which is designated as an underwater cultural heritage site. Side scanning and sounding operations were undertaken in the area to locate the wreckage of HMS Sirius which sank in 1810. In addition, personnel from Stanford University also undertook ROV operations after the precise location of the wreck was provided by MHS. The survey was carried out using Fast Interceptor Boat (FIB) provided by National Coast Guard in March this year.

2.2. **New Technologies/equipment.** Mauritius Hydrographic Service has procured shallow water Multi Beam System which would enhance our ability to carry out survey operations. The commissioning of the equipment is scheduled in mid of September this year.

2.3. **New Ships.** Nil

2.4. **Problems Encountered.** Nil

3. **New Charts & Updates.**

3.1. **ENC's.** A total of 10 Electronic Navigation Chart have been produced in collaboration with National Hydrographic Office, Dehradun for Mauritian waters. Since the last SAIHC meet one new Electronic Navigation Chart has been produced. The details of the new ENC is enumerated below:-

- (a) ENC Number - IN42529N
- (b) Chart Number - 2529
- (c) Chart Title - Northern Islets of Mauritius
- (d) Category - Approach
- (e) Publication Year - 2019
- (f) Scale - 50,000

3.2. **ENC Distribution Model.** ENCs covering Mauritian waters are distributed worldwide through UKHO, M/s Jeppesen Marine and M/s Primar Norwegian Hydrographic Service and M/s IIC Technologies Limited.

3.3. **RNC's.** Presently, UKHO is producing RNCs of Mauritian waters.

3.4. **INT Charts.** The list of INT charts for Mauritius are as follows: -

Sl No.	Chart No.	Name
(a)	2514 (INT 7739)	Port Louis and Approaches to Port Louis.
(b)	2503 (INT 77391)	Approaches to Cargados Carajos Shoals
(c)	2504 (INT 77392)	Mathurin Harbour
(d)	2505 (INT 77393)	Approaches to Mathurin Harbour
(e)	2506 (INT 77394)	Grand Bay and Grand Riviere Noire Bay
(f)	2507 (INT 77395)	Grand Port
(g)	2512 (INT 77396)	Agalega Island
(h)	2529 (INT 77397)	Northern Islets of Mauritius

3.5. **National Paper Charts.** Seven out of eight charts of the Mauritian waters

has been accorded INT status. The paper charts of Mauritian waters are available with the following agencies:-

- (a) Cartographic Section Ministry of Housing and Lands, Mauritius
- (b) National Hydrographic Office, Dehradun
- (c) Naval Chart Depots at Mumbai and Vishakhapatnam
- (d) M/s IIC Technologies Limited
- (e) M/s Jeppesen India Private Limited
- (f) M/s Lift o Marine
- (g) M/s C & C Marine Combine
- (h) M/s EW Liner Charts & Publication

3.6. **Other Charts.** The catalogue of charts for Mauritius is being expanded from 7 to 14 charts as per the charting scheme finalised in consultation with National Hydrographic Office, India. The new charting scheme would significantly enhance the navigational safety in Mauritian waters. The details of the additional charts are as follows:-

Sl No.	Proposed Chart	Scale	Remarks
1.	Mauritius	1:125 ,000	Chart in the final stages of Publication
2.	Gabriel and Round Island	1: 50,000	Surveys undertaken by INS Darshak in 2016-17
3.	Point Sud Ouest (Le Morne)	1: 10,000	Surveys undertaken by INS Sarvekshak in December 2018
4.	Souillac	1: 7,500	
5.	Approaches to Grand Port	1:30,000	Surveys undertaken by INS Sarvekshak in 2017-18
6.	Saint James Anchorage (Agalega)	1: 5,000	
7.	Rodrigues Island	1: 50,000	Surveys undertaken by INS Sarvekshak in January 2019

3.7. **Problems Encountered.** Nil

4. **New Publications & Updates.**

4.1. **New Publications.** The Hydrographic Unit has a long term plan to update and publish sailing directions for Mauritius.

4.2. **Updated Publication.** The catalogue of Paper Charts and Electronic Navigational Charts Mauritius has been updated with the publication of the new chart titled “Northern Islets of Mauritius”.

4.3. **Means of Delivery.** The catalogue of Navigational Chart is available at <http://housing.govmu.org/English/Documents/chart/CATALOGUEOCT%2016.pdf>

4.4. **Problems Encountered.** Nil

5. **MSI (Maritime Safety Information).**

5.1. **Existing Infrastructure for Transmission.** Mauritius is located in NAVAREA VIII where the NAVAREA Coordinator is India. A proposal for integrating existing MSIS infrastructure with NAVAREA warnings is presently under implementation in coordination with Shipping Division of Ministry of Ocean Economy, Marine Resources, Fisheries and Shipping.

5.2. **Training.** One Principal Surveyor from the Ministry of Housing and Lands attended the Phase I Skill course conducted at National Institute of Hydrography, Goa from 28 Jan 19 to 01 Feb 19 under the IHO CB plan

5.3. **Problems Encountered.** Nil

6. **C-55.** The updated C-55 table is placed at Annexure to the National Report.

7. **Capacity Building**

7.1. **Training Received, Needed and Offered**

(a) **Training Received**

(i) Training for one Survey Technician at the National Institute of Hydrography from October 2018 – February 2019 under the NIOHC Capacity Building Plan

(ii) 06 Weeks Training on Paper & Electronic Navigation Chart Production at National Hydrographic Office, Dehradun for two Officers under the Indian Technical and Economic Cooperation (ITEC) scheme.

(iii) Training for one Senior Survey Technician at the National Institute of Hydrography from February – June 2019 under the NIOHC Capacity Building Plan

(iv) Phase I Skill course conducted at National Institute of Hydrography, Goa from 28 Jan 19 to 01 Feb 19 under the IHO CB plan

(v) One Officer attended the first International Hydrographic Remote Sensing (HRS) Workshop at Ottawa, Ontario, Canada from 18th - 20th September last year.

(vi) On job training is regularly provided on-board Indian Navy ships during each survey mission.

(b) **Training Needed.** Additional training requirements exist in following areas: -

- (i) Nautical Cartography (Paper Chart and ENC chart production)
- (ii) 06 weeks Electronic Survey Equipment Orientation Course (ESEOC) for two survey Technicians conducted at National Institute of Hydrography.
- (iii) CAT 'A' and CAT 'B' courses for one Officer

(c) **Status of Bilateral Capacity Building Programme.** Since the last SAIHC meet three courses were conducted in India for the benefit of Mauritian Nationals as brought out above. Further, under the existing MoU on hydrography, the Government of India has deputed a Hydrographic team in Mauritius. The functions of this team are as follows:-

- (i) Prepare and regulate long-term program of hydrographic surveying and charting of Mauritian Waters.
- (ii) Carry out specialized survey with other government departments such as Oceanographic, Fisheries, Meteorological and Port authorities.
- (iii) Supervise and provide advice for any hydrographic survey work carried out by a private contractor.
- (iv) Represent Government of Mauritius at International and regional level on Hydrographic matters.
- (v) Act as focal point and repository for hydrographic and nautical information.
- (vi) Coordinate training facilities at national and international level for hydrographic surveying
- (vii) Recommend national policy and take steps for improvement of hydrographic survey services.

8. **Infrastructure and Equipment.** The basic infrastructure available for undertaking Hydrographic surveys at Mauritius Hydrographic Service are listed below:-

- (a) Inshore Survey Vessel “**Pathfinder**”
- (b) Atlas Deso-30 Echo sounder with 210 KHz and 33 KHz Transducers
- (c) Hemisphere R-131 Satellite DGPS.
- (d) TSS Dynamic Motion Sensor 25.
- (e) HYPACK 2019 software.
- (f) Infinity-EM Current Meter.
- (g) CARIS Processing Suite for Single and Multi-beam Sounding
- (h) Side Scan Sonar 4200 FS with Discover and Sonar wiz software
- (i) CTD 48M Sound Velocity Profiler
- (j) Precision Depth Recorders – PDR 601
- (k) Differential GPS – Aquarius 5000 Series (Dassault Sercel)
- (l) Teledyne Portable Single Beam Echo Sounder

9. **Oceanographic Activities.**

9.1. The Mauritius Oceanography Institute (MOI) advises Government on the formulation and implementation of policies and programs in respect to oceanography and marine resources. MHS also works in close collaboration with MOI for providing assistance in the collection of certain oceanographic Datasets like Sound Velocity Profiles, ocean Current Parameters, nature of seabed etc. The Mauritius Meteorological Service is responsible for the maintenance of tide gauges and production of tide tables in Mauritius. The following tide stations are in use:

<i>Locations</i>	<i>Digital Tidegauges</i>	<i>Installation</i>	<i>Sensors used to measure sea level</i>	<i>GPS Positions</i>
Port Louis (Trou Fanfaron)	Sutron SatLink Logger	14 March 2008	Encoder, radar, pressure	20 ⁰ 09.434' South, 57 ⁰ 30.256' East
Port Louis (Trou Fanfaron)	Vaisala (MAWS 301)	May 2005	Encoder, radar, pressure	
Blue Bay	Sutron SatLink (XLITE 9210)	29 November 2008	Radar, pressure	20 ⁰ 26.650' South, 57 ⁰ 42.655' East
Rodrigues (Port Mathurin)	Sutron SatLink Logger	8 March 2008	Encoder, radar, pressure	19 ⁰ 40' South, 63 ⁰ 25' East
Agalega (La Fourche)	Sutron SatLink (XLITE 9210)	22 November 2008	Radar only	10.346 ⁰ South, 56.586 East

9.2. **GEBCO Activities.** Mr Sattiabaruth Seboruth, Surveyor currently working with Mauritius Hydrographic Service was a part of the 16 member team from GEBCO which participated in the Shell Ocean Discovery XPRIZE competition. The team used an Unmanned Surface Vessel housing Kongberg AUV rated to 4500 m to undertake 278 sq Km of sea bed mapping. The Unmanned surface vessel launched and recovered the AUV autonomously at the the dive site which was at Kalamata Greece. The award was presented to the team at a ceremony at Monaco in June this year.



10. **Other Activities**

10.1. **GIS Platform for Marine Spatial Planning.** The information collected by the Indian Hydrographic ships for the last 13 years has been compiled in the form of nautical charts. Additionally, MHS has carried out numerous surveys in the near shore areas for meeting requirements of various stakeholders. The above data and information has been shared with the Department of Continental Shelf, Maritime Zones and Administration for implementing GIS Platform for Marine Spatial Planning, which would be useful for all concerned stakeholders of oceanic domain in future. Mauritius has so far established three technical working groups towards Marine Spatial Planning. These working groups are now focusing their actions on the new Economic Activities addressing issues related to aquaculture sites, marina development and tourism and recreational activities; Sustainable Development Goal 14 (SDG14) to achieve Target 14.5, that is conserving 10% of the marine area by 2020 and provide a relevant indicator for measurement; and mainstreaming Biodiversity Project–Establishing an electronic platform depicting geographical database concerning Environmentally Sensitive Areas within the framework of our Ocean Observatory. MHS is an integral part of the working groups. The bathymetry data collected by MHS is shared with MOI and Mauritius Met Office for the development of a robust Tsunami Surge model. MHS also works collaborates with National Disaster Risk Reduction and Management Centre (NDRRMC) towards certain technical issues.

11. **Areas of Significant Achievement.**

11.1. **CAPAM Award.**

MHS participated in an International level competition organized by the Commonwealth Association of Public Administration and Management. Amongst numerous cases submitted by common wealth



countries, the project submitted by MHS was selected amongst the top three in the final round under the category “Innovation Incubation”.

Any other Matters of Interest to SAIHC

11.2. **World Hydrography Day 2018 Celebrations.** The World Hydrography Day was celebrated on 24 Jun 2019 at Port Louis harbour with the theme “*Hydrographic information driving marine knowledge*”. The opening ceremony was held on board Coast Guard Ship Barracuda. Honourable Purmanund JHUGROO, Minister of Housing and Lands was the chief guest for the event. Dignitaries from various Ministries and several stakeholder organisations associated with maritime safety and security, Coastal Zone Management, oceanographic research, National Coast Guard, environmental protection and port operations were present for the opening ceremony. A sea-sortie was organised on-board CGS Barracuda for all the visiting dignitaries. The fair tracing of Deux Freres and Ile Fouquets to Ile de la Passe was presented by the Honourable Minister to H.E Shri Tanmaya Lal, the High Commissioner of India. Open days were organized for students including a visit to ISV Pathfinder and CGS Barracuda on completion of the opening ceremony. In addition exhibitions were organised for students of Shrimati Indira Gandhi State Secondary School, Quatrier Militaire , France Boyer de la Giroday State Secondary School, Plaine Magnien and Royal College, Curepipe on 26, 28 Jun and 02 Jul 19 in their respective school premises.



WHD 19 Celebrations

11.3. **Article in IHR.** An article titled “*Establishing Hydrographic Services in Mauritius*” has been published the November 2018 edition of the International Hydrographic Review.

Input to the IHO Publication P-5 (Yearbook)

Country : Mauritius
Organization : Mauritius Hydrographic Service

Contact information	
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Web site	housing.govmu.org
Country information	
Declared National Tonnage	Tonnage: 179981 T Date: 2019
-National day -Fête nationale -Fiesta nacional	Independence Day 12 March Republic Day 12 March
Date of establishment and Relevant National Legislation	Hydrographic surveys and nautical charting are under the ambit of Ministry of Housing & Lands. The legislative framework for hydrographic services would be formulated in due course.
Date first joined IHO	August 2005

Date ratification Convention	August 2005
Remarks on membership	Nil
Agency information/ Information sur l'agence/ Información sobre la agencia	
Top level parent organisation	Ministry of Housing and Lands
Principal functions of the organisation or the department	<ol style="list-style-type: none"> 1. Hydrographic surveys for compiling and updating nautical charts and products. 2. Project surveys in support of development activities, scientific research, coastal zone management, environmental protection, fisheries management and maritime security. 3. Compilation of Navigational warnings for promulgation through NAVAREA coordinator. 4. Procurement & Maintenance of hydrographic, oceanographic and marine cartographic equipment for the department. 5. Interact with International Hydrographic Organisation (IHO), North Indian Ocean Hydrographic Commission (NIOHC), South Africa & Islands Hydrographic Commission (SAIHC) on matters related to hydrography. 6. Provide training to surveyors, officers from Ministry of Housing and Lands & other stakeholders in the field of hydrography 7. Cooperate with other stakeholders and provide expertise on matters related to maritime domain.
Annual operating budget	Approximately 100,000 USD
Total number of staff employed	7
Number of INT charts published	7
Total number of paper charts published	8

Number of ENC cells published	10			
Number of Other charts	Nil			
-Type of publications produced	Catalogue of Chart			
Detail of surveying vessels/ aircraft	Name	Displacement	Date Launched	-Number of crew
	ISV Pathfinder	6.5 T	2012	05
Other information of interest	Following a memorandum of understanding in the field of Hydrographic Cooperation with India, a full-fledged Hydrographic Unit has been established at the Ministry of Housing and Lands in 2013.			

**Input to the IHO Publication C-55 (Status of Hydrographic
Surveying and Charting Worldwide)
Country: Mauritius**

C-55 Summary for:				Comments on Charts:
Country:	Mauritius			
Country Iso Code:	MU			
Country SubCode:	-			
INT Region:	H			
Country/Depend:	-			
Last updated:	March 2019			
Provided by:	Mauritius			
Chart coverage	Passage (%)	Coastal (%)	Port (%)	Comments on Surveys:
INT	100	87.5	100	
RNC	100	100	100	
ENC	100	100	100	
Status of Paper Charts				
Paper charts with depths in meters (%)			100	
Paper charts referenced to a satellite datum (%)			100	
Status of surveys	Adequate (%)	Resurvey (%)	No survey (%)	
0-200m	30	70		
> 200m	04	96		

MSI	Y/N	Comments on MSI:
Local warning	Y	
Coastal warning	Y	
Nav warning	Y	
Port warning	Y	
GMDSS	Y/N	Comments on GMDSS:
Master Plan	Y	
Area A1	Y	
Area A2	Y	
Area A3	N	
NAVTEX	Y	
SafetyNet	N	