

NATIONAL REPORT TO REGIONAL HYDROGRAPHIC COMMISSION

REPUBLIC OF INDIA- FEB 2010

1. Hydrographic Office / Service

1.1 The Indian Naval Hydrographic Department (INHD), with the National Hydrographic Office located at Dehradun, is the sole national authority for publication of nautical charts and publications for navigation at sea. As part of its international responsibilities, the Department provides coverage for marine safety information in the region NAVAREA VIII comprising of Indian Ocean, Arabian Sea and Bay of Bengal. With a fleet of eight modern ocean-going survey ships; fully equipped with latest hydrographic and oceanographic sensors and six more ships in the offing, it is a reckonable hydrographic organisation in the world.

1.2 The INHD is involved in systematic and standardised collection of geo-referenced data pertaining to coastal configuration, bathymetry, seabed composition, tides, currents, aids to navigation etc. The data collected by the fleet of survey ships is subjected to a highly controlled processing for creation of databases to be used in production of navigational charts, definition of maritime boundaries and scientific studies on seas and coastal zone. Since the past few years, the department has also been producing digital charts in the form of Electronic Navigation Charts (ENC) in accordance with specifications of International Hydrographic Organisation, for use in the Electronic Navigation Chart Display and Information System (ECDIS). The National Hydrographic Office is also involved in the task of disseminating vital marine safety information round the clock through Global Maritime Distress and Safety Services using International Maritime Satellites.

1.3 On the international front India is an active member of the International Hydrographic Organisation, Monaco and has representation on its various committees. In 2005, a Memorandum of Understanding on hydrographic cooperation was signed with Mauritius and hydrographic surveys of the Mauritian waters have been undertaken. In addition, surveys of ports and harbours of Seychelles and Maldives have also been undertaken.

1.4 The National Institute of Hydrography, Goa, an integral part of the INHD, has the national responsibility for conduct of hydrographic training within India and functions under the overall professional supervision of the Chief Hydrographer to the Govt of India. The Institute conducts courses for hydrographic officers, technicians, civilians as well as personnel from the Indian Ocean littoral states and has been classified as the Regional Hydrographic Training Centre for Africa, Persian Gulf and South East Asian region. The courses conducted by the School are recognised by the International Hydrographic Organisation; responsible for regulating and standardising hydrographic training world wide.

2. Surveys.

2.1 **Coverage of New Surveys.** Indian Naval Hydrographic Department (INHD) has undertaken Hydrographic Surveys both at National and International levels. For the survey season 2009-10, important surveys of some major and minor harbours in India, based on the periodic updation scheme, have been planned such as Mumbai, Karwar, Hazira, Karaikal,

Dighi, Kollam etc. Surveys are also planned towards updation of charts for the Andaman & Nicobar Islands and Gulf of Kachchh. In addition to these Navigational updation surveys, surveys of National importance are also allotted to ships such as Sethusamudram Channel Project and Archaeological survey of Elephanta Island (Mumbai). Additionally, the department also undertook International Hydrographic Co-operation survey of Maldives in Dec 09 - Jan 10 in sequel to earlier surveys undertaken in 2006 & 2007. Surveys for Mauritius have been planned in March-April 2010.

2.2 **New Technologies and/or Equipment.** The Indian Naval Hydrographic Department (INHD) is at the forefront as regarding to the induction and utilisation of modern and high-end surveying equipment/ technologies. Some of them are listed as under:-

2.2.1 **Positioning System**

- (a) Long range DGPS Systems - Thales/ Trimble
- (b) Medium range DGPS systems - Hemisphere
- (c) Terrestrial DGPS systems - Trisponder (DMU 586/ DDMU 1009+)
- (d) Geodetic RTK Receivers - GPS 530/ 1230 sets

2.2.2 **Depth Measuring Equipment.**

- (a) Singlebeam echosounder – Atlas Deso 25/ 30
- (b) Portable echosounder – Atlas Deso 300
- (c) Multibeam echosounder – SB 2112/ 3012 (ship) and SB 1180/ 3180 (boat)

2.2.3 **Processing System/ Softwares**

- (a) HYDAS, CARIS HIPS/SIPS/GIS and Hypack/Hysweep for bathymetric data collection and post processing
- (b) Geodetic data post processing software – Leica Geo Office (LGO)
- (c) ENC production software – CARIS HOM/ SAMI/ GIS Professional/ HPD.
- (d) ENC validation software – d’Kart.
- (e) Digital Side Scan Sonar data post processing software – Sonarwiz, Discover.
- (f) Image processing software – ERDAS Imagine.

2.2.4 **Miscellaneous Equipment**

- (a) Digital Side Scan Sonar 4200 FSL
- (b) Current Meters like 2D-ACM and Acoustic Doppler Current Profiler (ADCP)
- (c) Conductivity Depth Temperature (CTD) and Sound Velocity Profiler
- (d) Motion Sensors (DMS 3-05, DMS-25, HS-50, Atlas Dynabase)
- (e) Magnetometer, Gravimeter and Automated Tide Gauge

2.3 **New Ships.** In addition to the existing survey fleet of eight large survey ships, the construction of six Catamaran Hull type small survey vessels is underway with likely induction starting by mid 2010.

2.4 **Problems encountered** Nil

3. **New Charts & Updates.**

3.1 **ENCs.** India has produced 243 ENC Cells of the National Waters and two foreign ENCs (Mathurin Harbour and Cargados Carajos Shoals of Mauritius). Of all these ENCs released, the break up as per usage band index is as follows:-

CATEGORY	USAGE BAND	No OF ENCs
Overview	1	6
General	2	7
Coastal	3	55
Approach	4	47
Harbour	5	101
Berthing	6	29
Total		245

All the ENCs produced by INHO are subjected to stringent QA/QC before release. ENC updates are also generated and supplied every fortnight to the users.

3.2 **ENC Distribution Method.** Indian ENCs are presently distributed via the appointed VARs viz M/s Jeppesen Marine, PRIMAR and UKHO. At present, ENCs are being distributed by M/s Jeppesen Marine in CM-93/3 and S-63 IMO formats and by UKHO and PRIMAR in S-63 format.

3.3 **INT Charts.** India, as the coordinator of International charting group for the North Indian Ocean (Area J), has responsibility to produce 54 INT charts on medium and large scale. Out of 54 INT charts, India has produced 49 INT charts and remaining are planned to be produced in due course of time.

3.4 **National Paper Charts.** Indian National Hydrographic Office is responsible for production of Nautical Charts and publications. 329 nautical charts of Indian Ocean have been produced and are being maintained by INHO.

3.5 **Identification of Producer Nation.** India is the producer nation of small scale INT Charts, ENC's viz IN17705a & IN17706b for which its ENC production has already been completed. As regards to producer nation, India is the producer nation of all ENC's covering the National Waters.

4. **New Publications & Updates.**

4.1 **New Publications.** The following new Books/Publications were published during the last year:-

4.1.1	Notices to Mariners - Special Edition	-	2008
4.1.2	Nautical Almanac	-	2010
4.1.3	Tidal Predictions 2010 Indian and selected Foreign Ports (for Defence)	-	2010

4.2 **Updated Publications.** NIL

4.3 **Means of Delivery e.g. Paper, Digital.** Paper/Digital

4.4 **Problems encountered.** Nil

5. **MSI**

5.1 **Existing Infrastructure for Transmission.** All Radio Navigational Warnings for NAVAREA-VIII are issued by the Chief Hydrographer to the Government of India. The Naval Chart Depot, Mumbai coordinates the broadcasting of all Navigational Warnings. Reports/Information are directly sent to Naval Chart Depot by various authorities with a copy of information to National Hydrographic Office, Dehradun. This office closely monitors all broadcasts. Apart from this, information received directly in the office is also communicated to Naval Chart Depot for transmission. The Navigational Warnings (NAVAREAS) are forwarded to the Earth Station for transmission to be received through INMARSAT 'C' terminals. Furthermore, all the updated warnings including the Notices to Mariners are available on the INHO website www.hydrobharat.nic.in.

5.2 **Problems Encountered.** Nil.

6. **S-55 (Updated Table).** The updated S-55 table is placed at Annexure 'A' to this National Report.

7. **Capacity Building**

7.1 **Indo-Maldives.** India has undertaken two surveys of Maldives in 2006 and 2007. Subsequently, navigational charts of the areas namely Male Atoll (Chart No. 2099) and North Male Atoll and Approaches (Chart No. 2501) have been published. On further request of the Maldivian Government, one IN Survey Ship was deployed from Dec 2009 – Jan 2010 for undertaking survey of Kaashidhoo to North Male Atoll.

7.2 **Indo-Mauritius.** An MoU on co-operation in the field of hydrography was signed on 24 Oct 05 at New Delhi for Indian assistance in hydrographic survey of ports, harbours, sea lanes in Mauritian waters and training of Mauritian personnel at National Institute of Hydrography (Goa). In the last four years, IN survey ships have completed four survey deployments during which eight hydrographic surveys have been successfully undertaken and five navigational charts have been published namely; Agalega Island (Chart 2084), Approaches to Port Louis and Port Louis (Chart 2086), Mathurin Harbour (Chart 2504), Approaches to Mathurin (Chart 2505) and Cargados Carajos Shoals - Northern part (Chart 2503). The 5th Joint Committee meeting was held from 08 to 11 Feb 10 at Port Louis where the final tasking for the ship was discussed. A survey ship is scheduled to be deployed in Mauritius for undertaking hydrographic survey.

7.3 **Indo-Seychelles.** Joint surveys have been undertaken with Seychelles in 2003 (Approaches to Praslin), 2006 (Approaches to Mahe, Approaches to Port Victoria, Coetivy Island) and 2008 (Off Mahe). Three charts have been produced by INHO for their waters, viz. Port Victoria (Chart 2087), Coetivy Island (Chart 2085) and Western Approaches to Mahe Island (2502).

8. **Oceanographic Activities.** The Indian Naval Survey Ships equipped with oceanographic equipment have collected the various oceanographic data while undertaking hydrographic surveys.

IHO SPECIAL PUBLICATION S-55
“STATUS OF HYDROGRAPHIC SURVEYING AND NAUTICAL CHARTING WORLD-WIDE”
QUESTIONNAIRE

Country : **India**

Date of validity of Information : **16 Feb 2009**

Are any amendments required to your entry in the IHO Year Book? If so, enter below.
 Update is particularly important on your outsourcing strategy and on your ability to provide contract survey or charting support to other states in your RHC area.

INDIA (REPUBLIC OF)

NATIONAL HYDROGRAPHIC OFFICE Post Box No. 75 107 - A Rajpur Road DEHRA DUN – 248 001 (UTTARAKHAND)	
Department of which the Hydrographic Office is part – <i>Ministère don't dépend le Service Hydrographique –</i> – <i>Ministerio del que depende el Servicio Hidrográfico</i>	Indian Navy, Ministry of Defence.
Principal functions of the H.O. – Attributions <i>principales du S.H. – Principales funciones del S.H.</i>	Hydrographic surveys, Project surveys, Nautical charts, Electronic Navigational Charts (ENC), Notices to Mariners (Fortnightly), Radio Navigational Warnings, Light Lists, Sailing directions, Nautical Almanac, Tides, Tidal streams and currents, Oceanographic data analysis and publications, Marine and earth sciences, Coastal Zone Regulation Plan Charts, UNCLOS Charts, Fisheries Charts, Procurement & Maintenance of Hydrographic Oceanographic and Cartographic equipment for the department, Consultancy and Hydrographic Training for International Hydrographic Cooperation.
National day day – Fête nationale - Fiesta nacional	Independence Day 15 August Republic Day 26 January
Telephone :	+ 91 (135) 2747 365
Fax :	+ 91 (135) 2748 373
E-mail :	incho@dataone.in
WEB site:	http://www.hydrobharat.nic.in
Date of establishment and Relevant National Legislation – Date de fondation et législation nationale concernée– Fecha de establecimiento y Leyes nacionales de referencia	1776 Govt. of India. Rules of Business; The Territorial Waters. Continental Shelf. EEZ & Maritime Zones Act 1976.
Name and rank of the Director or Head– Nom et grade du directeur – Apellidos y graduación del Director	Vice Admiral B.R. RAO, AVSM, NM, VSM, FIS, IN Chief Hydrographer to the Government of India
Tonnage– Tonelaje	2009 = 15532720
Total Budget–Budget total – Presupuesto Total	Rs. 1000 millions approx (Annual Revenue Budget) including survey ship operations

<p>Staff employed - Effectifs - Plantilla</p>	<p>Rear Admiral SK Jha, NM Joint Chief Hydrographer</p> <p>Commodore TK Ashokan, NM Principal Director (Class Authority)</p> <p>Captain Vinay Badhwar Director (Chart Branch)</p> <p>Captain Ravi Nautiyal Director (International Affairs)</p> <p>Commander TP Mahato Joint Director of Hydrography (Operations)</p> <p>Commander A Muralidhar Joint Director of Hydrography (Chart Sales & Distribution)</p> <p>Commander A Banerjee Joint Director of Hydrography</p> <p>Commander NSS Sreenivas Joint Director of Hydrography (Data Management)</p> <p>Commander J Gurumani Joint Director of Hydrography (Maritime Safety Services)</p> <p>Mr. SS Chauhan Asst Civilian Chief Hydrographic Officer I</p> <p>Mr. Rajesh Kumar Asst Civilian Chief Hydrographic Officer II</p>				
<p>N° of charts published -Nombres de cartes publiées - N° de cartas publicadas.</p>	<p>329</p>				
<p>N° of INT charts published -Nombres de cartes INT publiées - N° de cartas INT publicadas.</p>	<table border="0"> <tr> <td>(a) Small scale</td> <td>2</td> </tr> <tr> <td>(b) Medium & Large Scale</td> <td>47</td> </tr> </table>	(a) Small scale	2	(b) Medium & Large Scale	47
(a) Small scale	2				
(b) Medium & Large Scale	47				
<p>N° of ENC cells published -Nombres de cellules ENC publiées - N° de células ENC publicadas.</p>	<p>245</p>				
<p>Type of publications produced (e.g; Tide Tables, Sailing Directions, List of Lights etc.) -Type de publications produites (par ex: Tables des marées, Instructions nautiques, Livres des Feux, etc. -Tipo de publicaciones producidas (por ej: Tablas de mareas, Derroteros, Libros de Faros etc)</p>	<ol style="list-style-type: none"> 1. List of Lights 2. Sailing Directions 3. Nautical Almanac 4. Symbols and Abbreviations 5. Notices to Mariners 6. Oceanographic data 7. Supplement to Indian Tide Tables 8. Catalogue of Charts 9. List of Radio Signals 10. Tidal Predictions for Minor Ports 				

Surveying vessels/ Aircraft – Bâtiments <i>hydrographiques/aéronefs - Buques hidro-gráficos/ Aeronaves</i>	Displacement	Date Launched	Crew
SANDHAYAK	1820	1981	200
NIRDESHAK	1820	1983	200
NIRUPAK	1820	1985	200
INVESTIGATOR	1820	1990	200
JAMUNA	1820	1991	200
SUTLEJ	1820	1993	200
DARSHAK	1820	2001	200
SARVEKSHAK	1820	2002	200
Outsourcing strategy - <i>Stratégie en matière de travail exécuté sous contrat à l'extérieur -estrategia de contratación de trabajos.</i>	1. Nil on Survey 2. Nil on ENC Production		
Other information of interest - <i>Autres informations utiles - Otra información de interés.</i>	1. National Institute of Hydrography is the Institute for Hydrographic Training. The Long Hydrographic Course and Basic “H” Course conducted by National Institute of Hydrography have been awarded CAT “A”, CAT “B” accreditation by FIG/IHO Advisory Board on Standards of Competence for Hydrographic Surveyors. In April 2006 the accreditation has been renewed for further six years. 2. ENCs of 100 % of National Water have been produced. Regular updates of ENCs are promulgated fortnightly. 3. Out of 54 INT Charts to be produced by India, 49 have already been published. 4. The Hydrographic Department of India has the required resources, Infrastructure and technical expertise to assist littoral states in the following areas: (i) Conduct of Hydrographic, Oceanographic and Coastal Zone Regulation Plan Surveys. (ii) Training in Hydrography and Cartography. (iii) Setting up of hydrographic infra-structure and Hydrographic Office. (iv) Exchange of personnel. (v) Production of Electronic Navigational Charts (ENCs). (vi) EEZ/Continental Shelf Surveys.		

1. HYDROGRAPHIC SURVEYING

1.1 **Status of Hydrographic survey of all Navigable Waters, including internal waters, out to the limits of the EEZ** : (Please refer to the guidance given in the introductory text "Analysis of the Status of Surveys".)

Survey Coverage, where :

A = percentage which is adequately surveyed.

B = percentage which requires re-survey at larger scale or to modern standards.

C = percentage which has never been systematically surveyed.

	A	B	C
Depths<200 m	100	0	0
Depths>200 m	88	12	0

Amplifying Information:

1. (a) The entire navigational area in depths less than 200 meters has been adequately surveyed. There are few small areas where the charted data is based on old surveys. These areas are well away from the shipping routes and are of no interest to the Mariners.

(b) There are some areas in Indian Waters like Gulf of Kachch & Khambat, Sandheads etc where the seabed is unstable. A cautionary note to this effect is printed on Navigational Charts.

2. Significant shortfalls in sea areas of high priority for maritime traffic:

a. Maritime Shipping Routes:

(1) International (i.e. between hub ports): **NIL**

(2) Regional (i.e. between hub ports and feeder ports): **NIL**

(3) Internal (i.e. from feeder ports to other national ports; cruise liner routes): **NIL**

b. Ports and approaches : **NIL**

c. Other (fisheries; offshore industry): **NA**

1.2 Status of Hydrographic survey of all Navigable Waters, including internal waters, out to the limits of the EEZ of dependent territories :

NA

1.3 Status of Hydrographic survey of all Navigable Waters, including internal waters, out to the limits of the EEZ of developing countries where surveys have been, or are going carried out by your hydrographic service:

NA

2. NAUTICAL CHARTING

2.1 Status of Nautical Charting within the limits of the EEZ

Coverage of charts published by your organisation, where:

A = percentage covered by INT series, or a paper chart series meeting the standards in M-4.

B = percentage covered by Raster Navigational Charts (RNCs) meeting the standards in S-61.

C = percentage covered by ENCs meeting the standards in S-57.

Purpose/Scale	A	B	C
Offshore passage/small	100	0	100
Landfall and Coastal passage/Medium	100	0	100
Approaches and Ports/Large	100	0	100
Percentage of Group A showing depths in meters	100		
Percentage of Group A referenced to a satellite datum	50		

Amplifying notes : Nil

Significant gaps in coverage : Nil

2.2 Status of Nautical Charting within the limits of the EEZ of dependent territories

NA

2.3 Status of Nautical Charting produced by mutual agreement within the limits of the EEZ of other coastal states

NA

3. MARITIME SAFETY INFORMATION (MSI)

NAVIGATIONAL INFORMATION (S-53)

Service	Yes	No	Partial	Notes
Local Warnings	√			
Coastal Warnings	√			
Navarea Warnings	√			
Information of Ports and Harbours	√			

GMDSS IMPLEMENTATION (IMO Publication 970 - GMDSS Handbook)

Service	Yes	No	Partial	Notes
Master Plan	√			
A1 Area	√			
A2 Area	√			
A3 Area	√			
NAVTEX	√			
Safety NET	√			

4. NATIONAL PRIORITIES FOR INTERNATIONAL AND OR REGIONAL CO-OPERATION OR ASSISTANCE

4.1 If international or regional projects are underway in your waters, please indicate here :

NA

4.2 Indicate below any priorities for co-operation or assistance:

(a) Projects meriting IHO liaison with international funding agencies:

(i) Regional co-operative projects : **NA**

(ii) National Projects : **MoU on hydrographic cooperation with Mauritius signed in Oct 05 for a period of 5 years.**

(b) Requirements for training assistance: **NIL**

(c) Requirements for assistance with procurement of equipment: **NIL**

5. GENERAL COMMENTS OR ADDITIONAL INFORMATION

NIL

Signature: **Commander TP Mahato
Joint Director of Hydrography
(International Affairs)**

Date: **19 Feb 2010**