



**COUNTRY REPORT OF  
THE HYDROGRAPHIC DEPARTMENT,  
ROYAL THAI NAVY**

**TO**

**8<sup>th</sup> NORTH INDIAN OCEAN  
HYDROGRAPHIC COMMISSION MEETING**

**GOA, INDIA**

# 15 - 17 APRIL 2008

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## **1. Hydrographic Office / Service :**

The Hydrographic Department, Royal Thai Navy (HDRTN), established in 1921, is a national authority responsible for various hydrographic services of Thailand. The main tasks are to provide services to serve marine navigational safety and the protection of the marine environment in Thai waters, military defense requirements and sustainable country development. To support these roles, HDRTN has conducted hydrographic surveys in Thai waters for nautical chart production covering the Gulf of Thailand and the Andaman Sea.

**Principle Tasks:**

- Surveying and producing navigational charts of Thai waters
- Oceanographic surveys and tidal prediction
- Aids to navigation maintenance
- Marine meteorological forecasting
- Thailand standard time keeping
- Navigational equipment procurement and maintenance

The Hydrographic Department, Royal Thai Navy is located at the outskirts of Bangkok, about 150 metres from the Chao Phraya River.

The present Director General is Vice Admiral Congvat Neelasri, who has held this position since 1 April 2007.



Fig - 1 Satellite image of the Hydrographic Department, Royal Thai Navy

## **2. Surveys**

### **2.1 Hydrographic Survey Activities**

In the year 2007 the HDRTN conducted hydrographic surveys for navigational charts production and updates as follows:

<b>Type of survey</b>	<b>Days</b>
Surveys for updating charts nos. 113, 147, 147A, 159	90
Survey for updating chart no. 142	45
Hydrographic control network for chart no. 243	45
Bathymetric survey around harbours	45
Coral line survey to support	9

Chulabhorn Underwater Marine Park	
<b>Total</b>	<b>234</b>

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## **2.2 Topographic Survey Activities**

In addition to hydrographic surveys, the HDRTN conducted topographic surveys to support the Royal Thai Navy activities and missions. Most of them were cadastral surveys. The total number of working days was 215 days.

## **2.3 International River Surveys**

There are two important surveys conducted along the international rivers as follows:

*2.3.1 The survey of joint demarcation and survey of the fixed and permanent international boundary between Malaysia and Thailand along the Sungai Golok (Kolak River)*

*2.3.2 The survey project of boundary demarcation between Laos and Thailand along Mekong River*

The budget for this survey project is funded by the Ministry of Foreign Affairs. It includes the provision of 3 new river survey boats with survey equipment on board such as Multibeam Echo Sounder System. The project will be completed and handed to the Ministry of Foreign Affairs in 4 years, starting from 2007.



#### **2.4 New ship**

The hydrographic surveys of Thai waters have been performed by using the German designed vessel named “HTMS Chandhara” and two other HDRTN small survey ships. In 2007, one of the two small survey ships was taken out of commission because of unseaworthy condition and was not worth refitting. HDRTN is now left with HTMS Chandhara and one small survey ship both of which are very old.



Fig - 3 HTMS Chandhara

HTMS Chandhara was commissioned in 1961 and has been active in major hydrographic services ever since. Due to the conditions and very long service of the ship, HDRTN submitted a proposal to the Royal Thai Navy to procure a new survey ship equipped with modern technology. After a long and thorough assessment, on 22 December 2005, the Royal Thai Navy contracted the Joint Venture of Unithai Shipyard and Engineering Ltd. and Schelde Naval Shipbuilding of the Netherlands, to build the ship at its premises at Laem Chabang Industrial Estate on the Eastern Seaboard, Choburi Province.

The ship was named by His Majesty King Bhumipol, “**HTMS Pharuehatsabodi**”, which means Jupiter.

HTMS Pharuehatsabodi is the multipurpose vessel for hydrographic surveying and mine countermeasure/training.

#### **Mission Profile**

- Hydrographic mapping survey and oceanographic survey
- Survey for environment conservation of sea & shoreline
- Supporting the marine scientific research
- Supporting sea rescue tasks
- Supporting oil spill cleaning
- Supporting training of mine warfare fleet
- Supporting the training course for students both inside and outside the Royal Thai Navy.

#### **Ship Description**

The hull, deck and superstructure are constructed from mild steel Marine Grade A.

#### **Principal Dimensions**

- |                       |          |
|-----------------------|----------|
| - Length overall      | 66.3 m.  |
| - Length on waterline | 61.3 m.  |
| - Beam Moulded        | 13.2 m.  |
| - Depth Moulded       | 6.5 m.   |
| - Displacement        | 636 tons |

### Hydrographic Survey System

- Exploration Computer System
- Multi Beam Echo Sounder (MBES)
- Single Beam Echo Sounder (SBES)
- Side Scan Sonar (SSS)
- Ultra Short Base Line (USBL)
- Motion and Reference Unit (MRU)
- Draught Indication System
- Tidal Measurement System
- Seawater Collection System
- Seawater Measurement System
- Expendable Bathythermograph (XBT) / Sound Velocity Meter (XSV)
- Current Flow Measurement System
- Current Meter System
- Sediment Collection System
- Survey Boat 1&2 Hydrographic Equipment
- Oceanography Equipment

### Capabilities

HTMS Pharuehatsabodi will operate in a specific area of the Gulf of Thailand and Andaman Sea and will operate continuously without additional supply for at least 15 days. The ship will be able to operate under sea state 5. She can operate at the maximum continuous speed of at least 12 knots, at trial draught and 100% MCR (Maximum Continuous Rating of the electric propulsion motors). In the case of operating at low speed, HTMS Pharuehatsabodi will be able to operate at speed between 0 - 6 knots without creating interference signature to survey equipment.

### Complement

- Complement of 41 which excludes hydrographic/oceanographic crew and sailors required during expedition.

HTMS Pharuehatsabodi was launched on Thursday 14<sup>th</sup> February 2008 and is scheduled to be completed and commissioned in July 2008.

Although HDRTN will have HTMS Pharuehatsabodi for conducting major survey tasks of HDRTN, HTMS Chandhara will remain in service.



Fig - 4 HTMS Pharuehatsabodi

## **2.5 Problems encountered**

HDRTN is continuing to improve hydrographic surveys to meet the standard of the IHO (International Hydrographic Organization) by conducting surveys based on WGS 84 and improving the harbour surveys by using the multibeam echo sounder. There are 35 surveyors who are not only responsible for all hydrographic surveys but also other special tasks to support the Royal Thai Navy, and other government offices, which are all urgently needed. Because of limited manpower, good management is necessary when arranging survey crews for every survey. HDRTN has obtained modern survey equipment to reduce manpower and survey time. So far, HDRTN can fulfill its objectives but would like to have additional modern survey equipment.

When HTMS Chandhara was still being refitted, HDRTN solved the problem by hiring private boats for the survey. However, extra days were needed for equipment installation on board and for calibration. The survey data obtained were of good quality.

A tight budget allocated by the Royal Thai Navy is also of major concern to HDRTN.

## **3. New Charts and Updates**

### **3.1 Paper Charts produced in 2007**

#### **1 New Chart**

- No. 171, Ko Phai to Ko Lan, 1:22,000 WGS84

#### **1 New Publication Charts**

- No. 102, Ko Chuang to Ko Kong, 1:240,000, Indian 1975

#### **3 New Edition Charts**

- No. 117, Laem Thoraphim to Ko Saba, 1:40,000, Indian 1975

- No. 156, Laem Chabang Commercial Port, 1:12,000, WGS84

- No. 307A, Surin Island, 1:20,000, Indian 1975

<b>Type of production</b>	<b>2007</b>
New chart	1
New publication	1
New edition	3
<b>Total</b>	<b>5</b>

### **3.2 Electronic Navigational Chart**

Up until early 2008, HDRTN has produced 22 cells covering Thailand's 10 main shipping routes and are ready for distribution as follows:

<b>No.</b>	<b>Cell Number</b>	<b>ENC Title</b>	<b>Usage Band</b>	<b>Scale</b>
1	TH100045	Krungthep to Singapore	Overview	1,500,000
2	TH300001	Gulf of Thailand Prachuap Khiri Khan to Ko Chuang	Coastal	180,000
3	TH300102	Ko Chuang to Ko Kong	Coastal	180,000
4	TH300203	Lang Suan to Prachuap Khiri Khan	Coastal	180,000
5	TH300204	Laem Kho Kwang to Lang Suan	Coastal	180,000
6	TH300205	Songkhla to Laem Kho Kwang	Coastal	180,000

7	TH300206	Songkhla to Kelantan	Coastal	180,000
8	TH400163	Map Ta Phut Industrial Harbour and Approaches	Approach	22,000
9	TH400164	Siracha and Approaches	Approach	22,000
10	TH400169	Entrance to Thai Petrochemical Industry Port	Approach	22,000
11	TH500114	Ko Sichang Harbour	Harbour	12,000
12	TH500137	Si Racha	Harbour	12,000
13	TH500156	Laem Chabang Port	Harbour	12,000
14	TH500157	Map Ta Phut Industrial Harbour	Harbour	12,000
15	TH500170	Thai Petrochemical Industry Port	Harbour	12,000
16	TH50115A	Sattahip Commercial Port (Chuk Samet Harbour)	Harbour	8,000
17	TH300307	Phangnga to Ranong	Coastal	180,000
18	TH400115	Ao Sattahip and Approaches	Approach	45,000
19	TH400171	Ko Phai to Ko Lan	Approach	22,000
20	TH400335	Phuket Harbour	Approach	22,000
21	TH50111A	Bangkok Port	Harbour	4,000
22	TH50335A	Ao Man and Approaches	Harbour	8,000

### **3.3 INT Charts Activities**

For INT Chart in Area J, HDRTN is responsible for 4 INT Charts on the Andaman Coast which were referred to the National Hydrographic Office of India for allocation of INT Chart No. as follows:

<b>INT No.</b>	<b>Producer</b>	<b>National No.</b>	<b>Scale 1 :</b>
***	TH	362 (Satun to Ranong)	700,000
***	TH	308 (Phuket to Kantang)	200,000
***	TH	335 (Phuket Harbour)	20,000
***	TH	335A (Ao Man and Approaches)	8,000

Note \*\*\* = INT Chart number will be assigned by NIOHC (India)

### **3.4 Problems encountered**

Since 2003 HDRTN has developed Thai ENC's to fulfill WEND Principles and to satisfy the needs of safe navigation. However, HDRTN's ENC production is still in the early stage. At present, there are 6 cartographers in ENC production team, including 1 inspector for quality assurance. HDRTN wants to develop and increase the number of the ENC production and quality assurance inspection team. Training with organizations with expertise in ENC production is needed.



HDRTN is also facing problems in ENC distribution and encryption. HDRTN's ENCs are not encrypted. Hence, anyone can purchase and modify those ENCs and/or value added those ENCs for their businesses to make profit of their own. To encrypt ENCs in accordance with IHO S-63, a substantial budget is needed. Unfortunately, the Royal Thai Navy cannot allocate such budget for this purpose. HDRTN, therefore, is in need of cooperation with any hydrographic agencies to encrypt ENCs and/or having arrangement with those agencies to distribute ENCs on behalf of HDRTN.

#### **4. Marine Safety Information**

Notice to Mariners both in Thai and English languages has been broadcast daily through the Navy Radio Station and NAVTEX Station (Bangkok Radio). The information issued to mariners is mostly concerned with chart corrections, aids to navigation status, ship wrecks, navy exercises, and oil & gas exploration activities.

#### **5. S-55**

##### **5.1 Status of Hydrographic surveys of all navigable waters, including internal waters, out of the limits of the EEZ.**

Survey coverage, where:

A = % adequately surveyed for depths of 0-200 m/ >200 m

B = % requiring re-survey at larger scale or to modern standards for depths of 0-200 m/ >200 m

C = % which has never been systematically surveyed for depths of 0-200 m/ >200 m

	A	B	C
Depth < 200 m	100	70 *	-
Depth > 200 m	15	100	85

Note : \* = For digital data collection in WGS84 and additional data for supporting ENC production

##### **5.2 Status of Nautical Charting**

Coverage of charts published by HDRTN, where:

A = % covered by INT series, or national equivalent meeting the standards in M-4

B = % covered by Raster Navigational Charts (RNC) meeting the standards in S-61

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

Purpose/Scale	INT Charts	RNC	ENC
Offshore passage/Small scale	100	0	70
Landfall and Coastal passage/Medium	100	0	100
Approaches & Ports/Large Scale	100	0	80
	A	B	C

#### **6. Capacity Building**

##### **6.1 Hydrographic Survey**

HDRTN intends to set up a team of young officers to specialize in multibeam, data interpretation and applications. At present there are 3 officers who attended the short course on multibeam overseas, 2 of whom were under IHO Capacity Building Program. They are HDRTN's valued officers and upon their coming back, they transferred their knowledge to their colleagues. However those 3 officers are still learning and gaining experience on multibeam systems through their field operations. In the near future, HDRTN will have a number of multibeam systems in service. That requires more officers to handle the systems. Therefore, training on multibeam system is urgently needed for HDRTN's officers.



### **6.2 ENC production**

As mentioned in item 3.4, HDRTN needs to develop and increase the number of ENC production and quality assurance inspection teams. Also, HDRTN is in need of encrypting ENCs. Training with organizations with expertise in the fields of ENC production, quality assurance and encryption is needed.

### **6.3 Train the trainers**

IHO CBC and/or capable hydrographic agencies should arrange for the training or seminar for the instructors or trainers in the fields of hydrographic surveys such as mutibeam system, and ENC production. Such training or seminars will develop technical knowledge and capabilities of personnel involved in that work so that they will train and transfer their knowledge to their staff. In addition, the training or seminars will provide good opportunities for participants to exchange and share their experiences.

## **7. Oceanographic Activities**

### **7.1 Tidal Recording and Prediction**

*7.1.1 Maintenance of 12 Tidal Stations and conducting the tidal prediction on 26 sites for production of Tide Table Year 2007*

*7.1.2 Maintenance of 9 digital tidal station network for tsunami warning on the Andaman Coast as follows:*

- |                    |                       |               |
|--------------------|-----------------------|---------------|
| - Paknam Ranong    | - Ko (Island) Tarutao | - Ko Surin    |
| - Ko Miang         | - Kuraburi            | - Kantang     |
| - Ao (Bay) Taplamu | - Ko Tapaonoi         | - Ko Rachanoi |

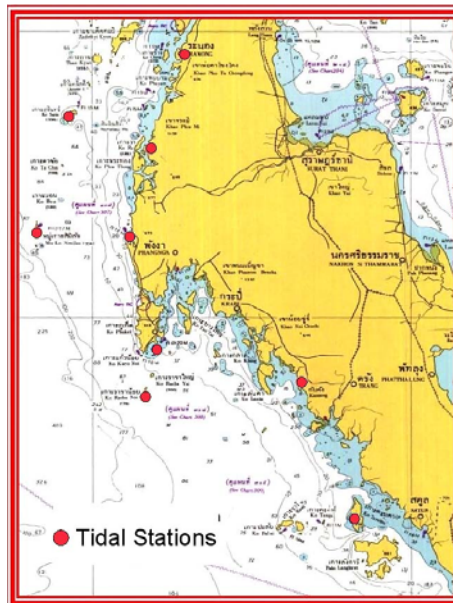


Fig - 5 Digital tidal stations for tsunami warning System

### **7.2 Problems encountered**

#### **Oceanographic survey**

During 2007, there was no major oceanographic survey because HTMS Suk the only oceanographic survey vessel, which is about 25 years old, was undergoing a major refit.

## **8. Other Activities**

### **8.1 Participation in COAST-MAP-IO Project**

HDRTN has participated in the COAST-MAP-IO Project to improve our expertise in the production of bathymetric and topographic maps of the high tide-line in order to build a model for predictions of tsunami arrival, run-up and inundation in coastal areas especially in the areas which were affected by tsunami in December 2004.

HDRTN hosted the COAST-MAP-IO kick off meeting between 24-26 October 2007. Representatives from 12 countries participating in the Project, including representatives from organizations which have expertise in multibeam systems, digital elevation model making and inundation mapping. The meeting was successful, and the Project Workplan between March 2007 - February 2009 was approved. The Project Steering Committee was established.



Fig - 6 Kick off meeting of COAST-MAP-IO Project, 24 - 26 October 2007

### **8.2 The Project on Lighthouse Light Failure System Phase II**

The Project started in 2005 and was completed in 2007. The aim of the project was to enhance safety of navigation and to warn mariners in good time that the light had extinguished and would allow HDRTN to fix the problems faster.

### **8.3 The Project on Controlling and Monitoring of Aids to Navigation Information in Thai Waters using the Automatic Identification System Phase II**

The Project started in 2006 and still continues. The aim of the project is to monitor the condition of aids to navigation in Thai Waters for safety of navigation. The positions of lighthouses, lights and buoys were registered. The remote site will detect and monitor the conditions of aids to navigation. In addition, the remote site will detect the signal from the vessels which has AIS installed. The signal will provide the name of the vessel and her characteristics, the course of the vessel, the actual position of the vessel, her cargoes etc. Those data and information are in accordance with the IMO Class A Standard. That information and data will be sent to the base station at HDRTN. On the other hand, the data and information of aids to navigation will be sent to vessel.

### **9. Conclusion**

HDRTN has made reasonably good progress since the last meeting in early 2007 with our surveying and nautical charting, although HDRTN would like to have made more rapid progress. However, it is pleasing to say that with the introduction into service of the survey vessel HTMS Pharuehatsabodi and the recent launching of the 3 river survey boats, HDRTN has high expectations of widening our scope of surveying and charting Thai waters and coastal areas.

Probably like most of the members, HDRTN is handicapped by very tight budget and unable to procure all the scientific equipment which HDRTN needs.



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