

Additional chart coverage may be found in CATP2, Catalog of Nautical Charts.
SECTOR 7 — CHART INFORMATION

SECTOR 7

EAST COAST OF INDIA (EAST OF BALISAHİ POINT) AND THE COASTS OF BANGLADESH AND BURMA

Plan.—This sector describes the E coast of India E of Balisahi Point and then the coasts of Bangladesh and Burma.. The descriptive sequence is from W to E and then S.

General Remarks

7.1 The Hugli River, in the NW part of the Bay of Bengal, is the W branch of the Ganges and the means of access for ocean-going vessels calling at the port of Calcutta. Flowing through the Sundarbans, the Pussur River, another branch of the Ganges, is navigable by ocean-going vessels to the port of Chalna. Similar type vessels also ascend the Karnaphuli River to the port of Chittagong.

The Orissa Coast and the Sundarbans Coast are generally low, whereas the Chittagong Coast is marked by high mountain ranges.

Cape Negrais lies about 333 miles SSE of Elephant Point, with the intervening coast being irregular and broken in many places by the rivers which discharge into the sea on the E side of the Bay of Bengal. High hills and mountains back this section of coast at varying distances inland, and in most cases generally lie in a N-S direction parallel to the coast. Mayu and Arakan Yoma are the principal ranges. Many of the peaks of these ranges are useful marks to vessels navigating along this coast.

Ramree Island and Mun Aung Island, the two largest islands of many which lie off this coast, lie about midway between Elephant Point and Cape Negrais. Combermore Bay and Hunters Bay indent the shore N of the former island.

Akyab is the most important commercial port, although Kyaukpyu is of some importance.

Winds—Weather.—The weather and climate of the area described in this sector is primarily influenced and determined by the NE and Southwest Monsoons and the short transitional periods between them. The year is divided into four seasons referred to as the Northeast Monsoon (winter monsoon, cool or dry season), the spring transitional or hot season, the Southwest Monsoon (summer monsoon, wet or rainy season), and the autumn transitional season.

The Northeast Monsoon, December through March, is marked by good weather, with very little rainfall.

The hot season, April and May, is an interim period of weak and variable winds prior to the Southwest Monsoon. Increases in rainfall in April and May do not equal the amounts of rainfall during June through August; this results in greater heating of the air masses.

The Southwest Monsoon, June through September, is characterized by cloudiness, overcast skies, light rain almost daily, interspersed with rain squalls or thunderstorms accompanied by torrential downpours. Restricted visibility, high humidity, and general adverse weather conditions are associated with the Southwest Monsoon.

The autumn transitional season, a period of weak and variable winds with land and sea breezes prevailing, occurs in early October after the withdrawal of the Southwest Monsoon and before the cooler, drier weather of the Northeast Monsoon is established in late November.

Tropical storms, with destructive winds, occasionally affect the coastal regions N of 15°00'N.

Tropical cyclones, which develop in the Bay of Bengal, occur most frequently during the transitional season. The Arakan Coast of Burma is more likely to be struck by a cyclone during the autumn transitional season than at any other time, but rarely is the Gulf of Martaban affected. During the hot season, some tropical cyclones cross the coast of the Gulf of Martaban.

Tides—Currents.—Surface currents across the head of the Bay of Bengal, as elsewhere in the bay, are developed and influenced by the effects of the monsoon winds.

At the Sandheads in August, a strong current sets to the W; in September, after the retreat of the Southwest Monsoon, the current setting to the W depends on the force and duration of the E winds. During October, the current sets W and SW.

Seaward of the Sundarbans Coast, there are strong rotary tidal currents. The flood current begins setting W at the end of the first quarter, its direction is WNW and at half flood about N. During the last quarter of the flood, the current sets ENE. At commencement the ebb current sets E, at half ebb it sets S, and during the last quarter of the ebb it sets WSW, thus making a complete rotation.

Tidal currents along the Chittagong Coast S of Elephant Point set parallel with the coast, with the flood current setting N and the ebb current setting S.

Tidal currents along the Arakan Coast set N on the flood and S on the ebb; they are greatly influenced by the immense volume of tidal backwater. Local in drafts of the current are strong during the flood and the outset is small during the ebb.

Caution.—Reefs, shoals, and sands extend seaward in a general S direction from the delta shore at the head of the Bay of Bengal. These dangers, with depths of 5.5m and less, lie within the 11m curve and in places extend up to almost 30 miles offshore.

Soundings provide a guide when approaching these shoals, but if in doubt as to the vessel's position, it is advisable not to shoal to depths of less than 36.6m until certain of the position.

Mariners should be aware of and have regard for the numerous dangers which lie offshore between Elephant Point and Cape Negrais.

Balisahi Point to the Sundarbans Coast, including the Hugli River to Calcutta

7.2 Balisahi Point (20°51'N., 86°58'E.) is the extremity of the low land N of the entrance of the Dhamra River.

The coast between Balisahi Point and the entrance of the Hugli River, about 69 miles NE, is low, flat, and covered with scrub and mangroves along its S part. Southwest of Chandipur, the trees are higher than elsewhere. Northeast of Chandipur, the coast remains low and sandy, but the sandhills are more plentiful. There are no distinctive landmarks.

The Orissa Coast terminates at the entrance of the Hugli River.

Winds—Weather.—A general description of the winds and weather along the coast has been previously given in [paragraph 7.1](#).

Baleshwar Road is in the track of cyclonic storms which pass through this area. Many disasters have been caused by these storms.

Tides—Currents.—At Balramgari, which is just within the **Burhabalang River Entrance** (21°29'N., 87°03'E.), springs rise 3.7m and neaps rise 2.4m.

The tidal currents in Baleshwar Road set NE during the flood and SW during the ebb. Both currents set at a rate of 2 knots at springs.

In the Burhabalang River, the ebb lasts 8 or 9 hours and sets at a rate of as high as 4 knots. The set of the flood averages only 0.5 knot.

Depths—Limitations.—Between Balisahi Point and the entrance of the Hugli River, the 18m curve lies about 9.5 miles E of Balisahi Point and extends NE to a position about 22 miles S of the entrance of the **Subarnarekha River** (21°34'N., 87°23'E.), and then extends ESE to a position about 40 miles S of the entrance of the Hugli River. With the exception of a detached 34.7m patch, which was reported to lie about 72 miles SE of Balisahi Point, there are known dangers seaward of the 18m curve. Those dangers which lie within the 5.5m curve adjacent to the coast are described under the principal description of the features which they front.

The coast between Balisahi Point and the entrance of the Burhabalang River is bordered by drying flats. The coast is low as far as the village of Bideipur, about 13 miles NNW of Balisahi Point. Between this village and Kalikoti, about 8 miles to the N, the flat coast is bordered by dense mangroves. At Nauri, about 11 miles NNE, the coast is marked by low sandhills and taller trees. These coastal features continue for an additional 10 miles NE to the village of Chandipur. A large double pagoda, about midway between Nauri and Chandipur and 2 miles inland, is visible among the trees on NW bearings.

A sand cliff, 16m high, lies in Chandipur. A black flagstaff lies near a large white bungalow, about 0.8 mile NE of Chandipur.

The entrance of the Burhabalang River lies 2.3 miles NE of Chandipur and is marked by low, barren, sandhills.

Anchorage.—**Baleshwar Road** (21°23'N., 87°07'E.), which lies off the entrance of the Burhabalang River, provides anchorage, in a depth of about 7.3m, sand and mud, good holding ground, with the flagstaff NE of Chandipur bearing 312°, distant 7 miles. This is the best anchorage for vessels with a draft of about 6.1m. Anchorage can also be taken closer inshore in lesser depths.

The anchorage can be approached with the highest part of Nilgiri Mountain (Dhobasila Pahar), about 16 miles W of the river entrance, bearing about 293°.

During stormy weather, anchorage can be taken off Kalikoti over a bottom of soft mud. The Burhabalang River is tidal for about 23 miles, but is navigable for only about 4 miles of this distance above the entrance. Native craft, with drafts up to 2.7m, can transit this part of the river.

7.3 Baleshwar (21°29'N., 86°57'E.) ([World Port Index No. 49550](#)) lies on the S bank of the Burhabalang River, about 16 miles above its mouth. This town was formerly a port of some importance, but in recent years there has been no sea-borne trade.

Cargo is transported by barges from the anchorage in Baleshwar Road.

The **Panchpara River** (21°31'N., 87°07'E.) discharges into the sea about 4.5 miles NE of the entrance of the Burhabalang River. The river is navigable only by small native craft capable of crossing the bar.

The coast between the entrance of the Panchpara River and the Subarnarekha River, about 13 miles ENE, is marked by several sandhills. Pippli Sand, which dries, lies about 2 miles S of the latter river entrance.

The **Subarnarekha River** (21°34'N., 87°23'E.) is reported to have moderate depths within its entrance and is navigable by native craft for about 16 miles of its distance. The former port of Subarnarekha lies at the mouth of the river, but is available only to fishing boats. A pagoda and a clump of trees lie near the mouth of the river on the W bank.

Anchorage can be taken off the mouth of the river, in depths of 8.2 to 9.1m, with the pagoda bearing 327°, distant 8 miles.

The Digwash Mohan and the Munder Mohan, both shallow streams, discharge about 13 and 17 miles ENE, respectively, of the mouth of the Subarnarekha River. The Pichaboni Khal discharges about 6 miles farther E.

The **Rasulpur River** (21°47'N., 87°54'E.), about 9.5 miles NE of the Pichaboni River, discharges on the W side of the Hugli River just within its entrance.

Quoin Sandhill (21°36'N., 87°28'E.) lies on the shore about 6.3 miles WSW of the entrance of the Digwash Mohan, otherwise this stretch of coast is without any prominent features.

South of the mouth of the Digwash Mohan, the 5m curve is tongue-shaped, with its outer edge about 10 miles offshore. Depths within this curve decrease to 4.6m. During bad weather, heavy breakers are raised over this shoal projection.

Jensen Sand, which dries 4.6m on its inner part and 4m on its outer part, extends about 8 miles SSW from the mouth of the Rasulpur River. Spense Sand, which dries from 0.3 to 2.4m in places, extends about 7 miles SSW from the S extremity of Jensen Sand. A shoal, with depths of 0.6 to 4.9m, extends about 19 miles S from Spense Sand and terminates in Western Sea Reef.

Buoy EB is moored 1 mile WSW of the outer end of Western Sea Reef.

Approaches to the Entrance of the Hugli River

7.4 Vessels entering the Hugli River approach Eastern Channel Light Vessel, equipped with racon and moored about 46.5 miles SSE of **Sagar Island Light** (21°39'N., 88°03'E.).

During the Southwest Monsoon, it is best to make the coast near **Pundi** (18°40'N., 84°27'E.) or between Pundi and **Ganjam** (19°23'N., 85°04'E.), where higher land backs the coast. When the weather is very hazy, the land is obscured until a very near approach is made. It is advisable to determine a vessel's position before proceeding N of **Puri** (19°48'N., 85°50'E.).

Soundings provide a guide when approaching this coast; the 183m curve lies about 21 miles SE of Pundi, 23 miles SE of Ganjam, and 15 miles S of Puri. At night, vessels should make Kalingapatam Light, Gopalpur Light, or Puri Light. Depths of 36.6m lie about 4 miles off Kalingapatam, 3.5 miles off Ganjam, and 13 miles S of Puri; continuous soundings should be taken when approaching the coast.

At night or in bad weather, a vessel should proceed along the coast in depths of about 36.6m. During the day, in clear weather, the Jagannath Pagodas at Puri and the black pagoda at Konarak should be sighted when passing. When about 10 miles beyond the black pagoda at Konarak, course should be shaped for Eastern Channel Light Vessel. Care should be given to the soundings when passing False Point, as the depths decrease gradually toward the shoal ground around it. At night, vessels should keep in depths of not less than 26m or even 37m when the wind is SE.

In September, toward the end of the Southwest Monsoon, the current sets strongly to the SW, and if a vessel's position is fixed, landfall should not be made so far to the S.

During the Northeast Monsoon, if a vessel is on the E side of the Bay of Bengal, course should be shaped directly for Eastern Channel Light Vessel.

Depths—Limitations.—A bank, located in position 20°44'N, 87°35'E and extending off the coast between False Point and Palmyras Point, is an excellent guide when approaching the entrance of the Hugli River. The bottom, when in depths of 36.6 to 42.1m, consists of reddish-colored shell and sand and gravel; in deeper water to the E or seaward, the bottom consists of sand and mud with shining specks, or olive-colored mud with broken shells. The E edge of the ridge is rather steep, with depths seaward of it ranging from 51 to 55m.

The 35m curve follows the NE curve of the coast and lies about 24 miles E of False Point Light and 25 miles E of Palmyras Shoals.

Pilotage.—Pilotage is compulsory N of latitude 21°39'N for all vessels of 200 grt and over. Pilots are available 24 hours.

All vessels approaching Sandheads, in the vicinity of Eastern Channel Light Vessel, should contact the pilot vessel by calling Sandheads Pilot on VHF channels 12, 14, or 16 for instructions. Vessels should also contact the Vessel Traffic Management System (VTMS) Station by calling VTMS Control on VHF channel 16 or 68 for anchoring or pilot boarding instructions. Vessels requiring a pilot are advised not to proceed N of latitude 21°00'N without being advised by Sandheads Pilot or VTMS Control to do so.

Sandheads Pilots or VTMS Control may instruct vessels to proceed to anchor S of Talent Light Vessel (Intermediate Light Vessel) or between Talent Light Vessel (Intermediate Light Vessel) and Lower Gasper Light Vessel.

Vessels anchoring should state their anchoring (in local time) and position to Sandheads Pilot or VTMS Control after an-

choring and maintain a continuous listening watch on VHF channel 16.

For tankers and vessels greater than 160m, pilots may board S of Upper Gasper Light Vessel, depending on the prevailing weather conditions.

The normal draft for vessels that can be taken upriver at springs, under normal conditions, is about 7.9 and 7.3m at neaps. Occasionally the maximum draft at neaps decreases to 5.2m. A forecast of monthly drafts is published by the port authorities; for deeper draft vessels or vessels of 7 knots and under, special arrangements must be made and the date selected by the port pilotage office.

In 1976, a barrage, 60 miles N of Calcutta, was in operation. This is expected to control the river flow so as to enable vessels of 8.5m draft to reach Calcutta throughout the year and to reduce the effect of tidal bores.

The pilot vessel is stationed between Gasper Channel and Sagar Island. In very strong winds and heavy seas, the pilot vessel cruises about 10 miles S of the light vessel..

The pilot vessel, when sending a pilot to board a vessel, will lie with the wind on its port side at all times throughout the year. When supplying a pilot, the pilot vessel will be underway during the Southwest Monsoon from March 15 to October 31 inclusive; it may be found at anchor during the Northeast Monsoon, either in the vicinity of the light vessel, or up to 10 miles N of the Eastern Channel Light Vessel. No vessel shall anchor within a radius of 2 miles from Eastern Channel Light Vessel..

Masters of vessels wishing to board a pilot are advised to approach the pilot vessel from astern of it, heading in the same direction, and about three ship's length distant. The pilot vessel will proceed ahead, dropping a pulling or motor boat, which should be picked up. The pilot vessel will always either turn around or move far enough ahead to allow the following vessel sufficient sea room to maneuver. Deep-draft vessels, approaching slowly during the Southwest Monsoon, should bear in mind that the pilot vessel is drifting to leeward and should approach slightly on its starboard quarter. A long boat rope and a pilot ladder fitted with man ropes should be ready on the starboard side.

During the Southwest Monsoon, from March 15 to October 31, the pilot vessel, when on station at the Sandheads will display, between sunset and sunrise, a flashing white light every 3 seconds. The light is displayed from the top of the superstructure, but is not easily made out because of its low power.

The pilot vessel displays the usual signals for a pilot vessel on station when underway and, in addition, a light at the foremast head, which is displayed in accordance with orders issued by the local port authorities. A stern light is also displayed. A red and white pilot flag is displayed by day. This flag is only displayed when a pilot is available on board.

Should the pilot vessel be at anchor, it will display the International Code of Signals signifying that it is at anchor. At night, it will display the lights for a pilot vessel at anchor, together with the anchor lights.

Should a vessel arrive at the Sandheads and not find a vessel displaying the above signals, it will signify that no pilots are available on the station. Instructions should then be requested by radio.

Vessels arriving at the Sandheads should have their clocks set to Bengal time, which is 5.5 hours fast of GMT; this time is kept by the pilot vessel and at Calcutta. Vessels should attempt to inform the pilot vessel by radio at least 24 hours in advance of their ETA at the pilot vessel, stating their grt, draft in fresh water, speed, length overall, whether any explosives are on board, number of passengers if any, and details about any livestock.

An ETA should be sent to the pilot vessel at the Sandheads immediately upon vessel's departure from a port less than 24 hours steaming distance away. Vessels wishing to make any sound signals should do so in accordance with the Regulations for Preventing Collisions at Sea.

To enable a vessel to reach Calcutta on one tide it is best to arrive at the Sandheads at the time of low water at Sagar Island. However, it is necessary to have daylight for the last 4 hours of the passage.

With a strong E wind, there is a strong set to the W. It is then especially important that masters be guided by the advice given by the pilot vessel.

Signals from the pilot vessel to prepare for bad weather should not be ignored.

The tidal current should be studied; with the first of the flood setting to the W, a vessel should lie E, and with the first of the ebb setting E, lie W and N.

Lloyd's agents at Calcutta have facilities for delivering communications to vessels at the Sandheads.

When within the Hugli River, vessels embarking a pilot hoist a black ball at the masthead, lowering it to half-staff when at low speed.

Anchorage.—If for any reason it should become necessary to anchor when approaching the pilot vessel, a vessel should do

so S of a line bearing 270° from **Matia Station Buoy** (20°59'N., 88°38'E.), in a depth of not less than 27.4m, mud, and not too close to the pilot vessel.

When anchoring, vessels should stem the tide before letting go an anchor, because the current sets strongly at the Sandheads.

The Hugli River Entrance (21°39'N., 88°01'E.)

7.5 Eastern Channel Light Vessel, which is frequently moved, marks the entrance of Eastern Channel, the main fairway leading to the Hugli River. Eastern Channel is available for use both by day and night and leads into Gaspar Channel, which in turn leads into Sagar Roads

Caution.—Several dangerous wrecks, best seen on chart, have been reported in the immediate vicinity of Eastern Channel Light Vessel.

Western Channel leads into Beaumont's Gut and then into Sagar Roads. Western Channel Station Buoy, conical, black and white stripes, with black framework topmark, is moored 19 miles S of the S end of Eastern Sea Reef.

Sagar Roads (21°39'N., 88°01'E.), the navigable entrance at the mouth of the Hugli River, lies about 2 miles W of the SW extremity of Sagar Island.

The navigable entrance channel leading to Sagar Roads is subject to change in position and direction to accompany the change in depths, which occur from time to time. Local knowledge and assistance is essential to safe navigation.

Winds—Weather.—The wind and weather prevalent at the Sandheads is given in the accompanying table.

The Sandheads—Winds and Weather				
Months	Wind	Force	Weather	Remarks
September, after breaking up of the Southwest Monsoon	Easterly	Light and variable	Showers of rain	Westerly current depending on force and duration of easterly winds; weather generally clear
October	Easterly and calms	Variable	Stormy, sultry at times	Westerly and southwesterly current; generally a gale or cyclonic storm
November, December, January	Northerly in morning and evening	Fresh in morning and evening, calm midday.	Fine weather with cool mornings and evenings	Cessation of the strong tides of the Hugli; fogs in January in morning
February	Variable, southerly at night; northwesterly sometimes	Light	Warm toward end of month	Thick fogs in morning; floods strong in Hugli toward end of month
March, April, May	Variable, until end of March; westerly and southwesterly in April and May	Light at first, sometimes strong at end.	Northwesters, with rain, thunder, and lightning, frequent; hazy	Flood tide occasionally accompanied by bore; sometimes a gale or cyclonic storm in April or May
June	Southwesterly	Strong at first	Northwesters decreasing in force; heavy thunderstorms	In June, the "chota bursat" or small rain, generally lasts a fortnight

The Sandheads—Winds and Weather				
Months	Wind	Force	Weather	Remarks
July	Southwesterly; westerly	Strong; gales frequent	Squally heavy rains	Freshets in the river, much swell in Eastern Channel
August	Southwesterly and westerly; westward during day, hauling to southward toward evening	Lighter	Squally, heavy rains; generally clear	Strong, westerly current at the Sandheads

Tides—Currents.—Seaward of the Sundarbans, there are strong rotatory currents. During the rising tide, the tidal current commences by setting W and gradually turns through N to NE. During the falling tide, it commences by setting E and gradually turns through S to SW.

At the Sandheads there is a strong W current in August; during September, after the cessation of the Southwest Monsoon, the W current depends on the force and duration of the E winds; in October, there is a W and SW current. During cyclonic weather a strong W set of 2 knots is experienced.

Tides at the Sandheads and in Sagar Roads are semidiurnal. Sagar Tidal Semaphore, displaying day and night signals, lies about 0.5 mile SSW of Sagar Island Light. Dublat Mark lies on Sidney Point, the SE extremity of Sagar Island.

In Eastern Channel, the tidal currents set as follows during the flood, when not influenced by the wind:

1. First quarter—bearing 306°.
2. Second quarter—bearing 340°.
3. Third quarter—bearing 025°.
4. Fourth quarter—bearing 070°.

During the ebb the current sets, as follows:

1. First quarter—bearing 126°.
2. Second quarter—bearing 160°.
3. Third quarter—bearing 194°.
4. Fourth quarter—bearing 070°.

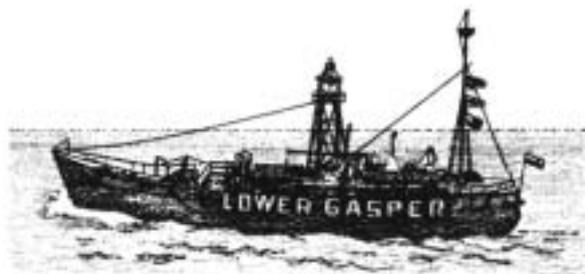
The maximum velocities range from 2 to 3 knots at springs, and 1 to 1.5 knots during neaps between the bearings of 340° and 160°.

Depths—Limitations.—Eastern Sea Reef (21°14'N., 88°03'E.), with depths of 0.6 to 4.9m, has its S extremity about 29 miles S of Sagar Island Light. This reef extends S from Lower Long Sand, a drying shoal with its N end about 4.5 miles SSW of Sagar Island Light. A shoal, with depths of 0.6 to 4.9m, extends about 26 miles SSE from **New Island** (21°33'N., 88°11'E.). During the Southwest Monsoon, the sea breaks heavily over the S end of this shoal.

Middle Ground, with depths of 1.2 to 5.5m, lies between Western Sea Reef and Eastern Sea Reef. Depths over this shoal range from a drying patch on its N end to a depth of 5.2m over its S end. This shoal breaks heavily during the Southwest Monsoon. **Lower Gasper Light Vessel** (21°24'N., 88°10'E.) has a red hull with one mast surmounted by a topmark.

A similar breaking shoal, with depths of 0.6 to 5.5m, lies between Eastern Sea Reef and the previously-described shoal which extends SSE from New Island.

Eastern Channel, with Gaspar Channel, its N extension, lies between Eastern Sea Reef and the shoal to the E which extends about 26 miles SSE from New Island. Sagar Roads is entered



Lower Gasper Light Vessel

N of this latter channel. Both Gasper Channel and Sagar Roads are marked by lighted buoys. A number of dangerous wrecks, marked by buoys, are encountered at the junction of the two fairways.

Western Channel lies between Western Sea Reef and Eastern Sea Reef, and leads into Beaumont's Gut, which leads into Sagar Roads.

Upper Long Sand (21°34'N., 87°57'E.), a drying bank about 5 miles long, lies with its upper end about 5.3 miles SW of Sagar Island Light. A narrow shoal, with depths of 1.8 to 4.6m, extends 10.5 miles S from Upper Long Sand and then curves NE to join the upper part of Eastern Sea Reef.

Mizen Sand, a small drying bank, lies about 2.3 miles N of Upper Long Sand; Tigris Sand lies about 1 mile farther N. Lighted Buoy LWA (port hand) is moored close off the NE end of Mizen Sand. Lighted Buoy AD (port hand) is moored close off the E side of Tigris Sand, 2 miles NNW of Lighted Buoy LWA.

Auckland Bar (21°45'N., 87°59'E.), with depths over 4.6m, is marked by Lighted Buoy AS, 0.5 mile NE of Tigris Sand. A passage from Auckland Bar to Haldia Port is made through Jellingham Channel, marked by lighted buoys.

In 1986, it was reported that sand banks and islands SW of **Aguimari Char** (22°00'N., 88°08'E.) were to be washed away to form a crossing to run from Jellingham Channel to Rangafala Channel, lying E of Aguimari Char. This connecting channel will allow an alternate route to Kulpi Roads and Calcutta, a detour from Haldia Channel. In 1988, Rangafala Channel was marked by lighted buoys. In 1989, it was reported that vessels make passage through Rangafala Crossing SSW of Aguimari into Rangafala Channel.

Middleton Bar (21°36'N., 88°03'E.), which dries 1.2m near its S end, lies centered about 3.3 miles S of Sagar Island Light, on the W side of Gaspar Channel. North of Middleton Bar a

narrow shoal, with depths of less than 3m, extends about 4 miles N to join the drying coastal flat about 2 miles N of Sagar Island Light. A drying bank lies on this shoal about 1.5 miles WSW of the same lighthouse.

Aspect.—**Sagar Island** (21°44'N., 88°07'E.) lies on the E side of the Hugli River entrance and is flanked on its E side by the Baratala River, and on its W side by Bedford Channel. The main fairway leading into the Hugli River passes close off the SW extremity of this island. Although well-populated and heavily cultivated, the island has few distinguishing features.

Regulations.—The master of an incoming vessel should report the health condition of his vessel to the pilot when he boards at the Sandheads and act in accordance with his instructions.

A vessel arriving at the Sandheads from an infected port, or having plague on board, or a vessel on board which one or more cases of plague have developed within twelve days of the date of arrival, shall hoist and keep flying a yellow flag, and the signal indicating the port departed. Permission to haul them down must be obtained in writing from the health officer.

During this period, no communication shall be held with the shore, or with any other boat or vessel, with the exception of the pilot boat.

In the case of a vessel with sickness on board, which the pilot has reason to believe is plague, the pilot shall notify the health officer from Sagar and shall not proceed beyond Diamond Harbor without permission of the health officer. If the pilot has no reason to believe that there is anyone suffering from plague on board, the pilot shall bring the vessel up the river to Garden Reach and anchor it off Matia Bruz until visited by the health officer.

Vessels with cases of smallpox, cholera, measles, or other epidemic diseases common in India, or of diphtheria or scarlatina on board, or those on which two or more deaths from suspicious causes have occurred during the voyage, must report the facts to the pilot immediately after boarding the vessel; the pilot will give instructions as to the signals to be hoisted.

A vessel that has called at any yellow fever infected port within 1 month of arrival in Calcutta, even though it may have entered another Indian port during that period, will not be granted free pratique. Health officials will board such a vessel at its berth.

Radio pratique may be obtained prior to arrival at Calcutta in accordance with local instructions.

The quarantine station is situated at Diamond Harbor.

Signals.—Storm signals are displayed at Sagar Island Light; the [Extended System](#) is used.

Anchorage.—Sagar Roads provides anchorage, in 9.1 to 14.6m, in ordinary weather. During heavy gales, a considerable swell rolls into the roads.

Caution.—A dangerous wreck, with a least depth of 1.5m, lies in Bedford Channel about 0.6 mile off the W coast of Sagar Island, about 3.5 miles SW of the N extremity of the island.

The coastal features on the W side of the mouth of the Hugli River to the **Rasulpur River** (21°47'N., 87°54'E.) have been previously described.

The Hugli River to Calcutta, including Haldia and Diamond Harbor

7.6 Navigation on the Hugli River is reported to be difficult. The 39 mile stretch from Hugli Point (22°13'N., 88°04'E.) to Calcutta is the most treacherous. In 1984, it was reported that the channel buoys were not well maintained, many were either unlit or missing. It was reported (1976) that night navigation above Hugli Point was prohibited.

The navigable channel in the river is subject to annual variations; these are caused by the scour of the freshets and the flood current, as the season is wet or dry, respectively. The channel through the estuary is subject to such changes as occur in all wide, sandy, tidal estuaries.

Vessels take advantage of the rise in tide and cross the shallowest bars at HW; this results in bunching of vessels. A vessel inbound can generally go up the river with the tide without any stops, but sometimes it might take about 24 hours with an anchorage stop along the way. An outbound vessel cannot cover the total distance of the river during the same high tide; the transit down the river is made in stages. According to the speed and type of vessel, sailing down the river takes about 36 hours to 48 hours, with stops at Ulubaria (abreast of Achipur Point), Diamond Harbor or Kulpi Roads, and Sagar Roads Anchorage.

Sharp bends in the river upstream of Diamond Harbor limit the length of a vessel to 189m at Buj-Buj and 172m at Calcutta.

During times of predicted tidal bores, the overall length of vessels will be regulated by the harbor master.

The navigable channels of the Hugli River, leading to Calcutta N of the parallel of latitude 21°01'N, are under the jurisdiction of the Port Commissioners of Calcutta.

Vessels proceeding against the current should slow down or stop if it appears that other vessels will be met with at difficult parts of the river, or on bars where the deep-water channels are narrow. The usual rule of the road is adhered to in the river and estuary. A prolonged blast of the whistle, quickly followed by three short blasts, is an optional signal that the vessel making the signal is obliged to stop and cannot get out of the way.

Winds—Weather.—The wind and weather conditions usually encountered in the upper reaches of the Bay of Bengal and the approaches to the Hugli River have been previously described in [paragraph 7.1](#). Storm and weather signals, in accordance with the [Indian General System](#), are displayed at the following points when the weather in the Bay of Bengal is disturbed:

1. Diamond Harbor, near the telegraph office.
2. Budge, near the telegraph office.
3. Kidderpore Docks, from the clock tower near the entrance.
4. From the flagstaff on the Port Commissioner's Office in Calcutta.

The following signals and instructions from the [General System](#) have been approved by the Deputy Conservator of the Port of Calcutta for the security of shipping and are described in greater detail so as to have local significance.

1. **Danger Signal V**—Indicates that a storm of slight or moderate severity will probably cross the coast to the E of Sagar Island and W of Chittagong. Vessels may proceed to sea if the height of the barometer, state of the sea, and

weather are such as to lead masters and pilots to infer that there is no danger. The wind at the mouth of the Hugli will probably haul from NE through N to NW or W.

2. **Danger Signal VI**—Indicates that a storm of slight or moderate severity will probably cross the coast to the W of Sagar Island and N of False Point. The wind at the mouth of the Hugli will probably veer from NE through E to SE or S. As these E winds will raise a heavy swell and produce a strong W set in the channel at the Sandheads, it is advisable that none but fast steamers in light trim should put to sea, and those only if the weather appearances and state of the sea are not too unfavorable.

3. **Danger Signal VII**—Indicates the approach toward Sagar Roads of a storm of slight or moderate intensity. It is advisable that no vessels, except fast vessels in light trim, should put to sea until the wind direction and force, the state of weather and sea, and the rise of the barometer indicate that the storm has either broken up or passed inland. It should be remembered that cyclonic storms of small extent in the Bay of Bengal sometimes blow with hurricane force, and raises a high sea near their centers.

4. **Great Danger Signal VIII**—Indicates that a storm of great intensity will cross the coast to the E of Sagar Island and W of Chittagong. It is advisable that sailing vessels, with or without steam, and deep-draft or slow vessels should not proceed to sea. The wind at the mouth of the Hugli will probably haul from the NE through N to NW or W.

5. **Great Danger Signal IX**—Indicates that a storm of great intensity will cross the coast to the W of Sagar Island and N of False Point. Vessels should not go to sea; masters and pilots of vessels outward bound should be guided by the appearance of the weather and height of the barometer in deciding whether it is advisable to proceed below Diamond Harbor or Mud Point. The wind at the mouth of the Hugli will probably veer from NE through E to SE or S.

6. **Great Danger Signal X**—Indicates the approach of a storm of great intensity toward the mouth of the Hugli and Calcutta. Vessels should not go to sea from Sagar Island, or proceed down the river from Diamond Harbor; all vessels should be properly secured.

The masters of vessels in the port should take the special precautions for safety laid down in the port rules.

A cyclonic storm of severe intensity is frequently accompanied by a storm wave, which is not often the case with a small cyclonic storm. The height and destructive effect of a storm depend almost as much on the state and character of the tide when the cyclonic center reaches the coast, as upon the depression at the center, or the intensity and extent of the storm.

Tides—Currents.—Tides in the Hugli River are semi-diurnal.

Tidal semaphores have been established at the following places to indicate the rise of the tide in the Hugli River:

1. About 0.5 mile SSW of Sagar Island Light.
2. At Gangra, on the W bank about 7.5 miles NW of the N point of Sagar Island.
3. At Balari, on the W bank about 12 miles NE of the tidal semaphore at Gangra.

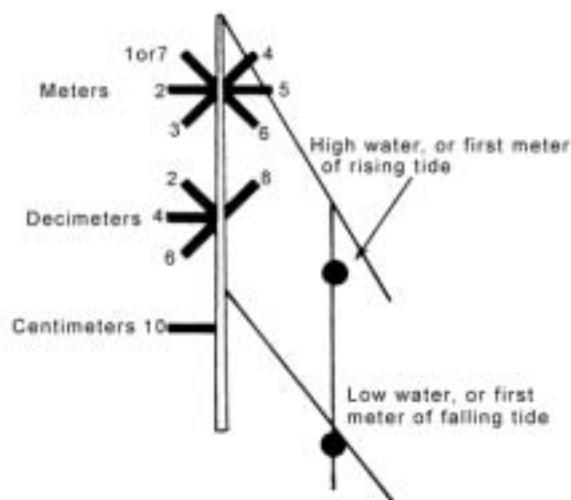
4. On Hugli Point, about 12 miles upriver from the semaphore at Balari.

5. At Moyapur, about 17 miles downriver from Kidderpore Docks.

6. At Akra, about 6.5 miles downriver from Kidderpore Docks.

7. At Rajabagan, about 3 miles downriver from Kidderpore Docks.

The semaphores have three arms, the upper arm indicates meters, the middle arm decimeters, and the lower arm centimeters, as depicted in the diagram below.



Hugli River Tidal Semaphore Signals

At the moment of HW, a ball is hoisted to its upper position; as the tide begins to fall, the ball is lowered to the lower position until the tide has fallen by 1m, when the ball is hauled down. At LW, the ball is hoisted to the lower position; as the tide begins to rise, the ball is hoisted to the upper until the tide has risen by 1m, when the ball is hauled down.

Night semaphores are situated at Sagar, Gangra, Balari, Hugli Point, and Moyapur.

Each semaphore can display two flashing lights, an upper light showing a 2 second flash every 8 seconds and a lower light showing a flash every second.

The rise of the tide is indicated as follows:

Signal	Tidal Rise
Upper light green	1.0m and 4.0m
Both lights green	1.2m and 4.2m
Green over red	1.4m and 4.4m
Green over white	1.6m and 4.6m
Lower light green	1.8m and 4.8m
Upper light red	2.0m and 5.0m
Red over green	2.2m and 5.2m
Both lights red	2.4m and 5.4m

Signal	Tidal Rise
Red over white	2.6m and 5.6m
Lower light red	2.8m and 5.8m
Upper light white	3.0m and 6.0m
White over green	3.2m and 6.2m
White over red	3.4m and 6.4m
Both lights white	3.6m and 6.6m

One fixed red light is displayed if the semaphore is not working.

The strength of the tidal current varies in different parts of the Hugli River at different times of the year; its velocity is least during the Northeast Monsoon from November to February, when it is 3 to 3.5 knots at springs and 1.5 to 2 knots at neaps.

During the latter part of the dry season, the Southwest Monsoon blowing in the direction of the flood current increases its velocity so that it flows up the river at 4 to 6 knots during spring tides.

The descent of the freshets, from July to October, causes the ebb current to predominate and it reaches a maximum velocity of 7 knots during spring tides; at this time the flood current is imperceptible, except in the estuary.

There are three distinct periods in the year, lasting approximately 4 months each. During the cold season, the flood current has a slight preponderance over that of the ebb, because of its shorter period of flow. The flood current, during the second half of the dry season, is made considerably stronger than the ebb by the Southwest Monsoon. During the rainy season, the flood current is over-powered by the descent of freshets and the ebb current predominates accordingly.

The great body of the tidal current flows in the direction of the channels at velocities of 2 to 3 knots at springs and 1 knot to 1.5 knots at neaps.

At LW during spring tides, the flow of the flood current is checked by the shallow and restricted bed of the river and by the seaward flow of water from the upper reaches. These conditions can lead to the creation of a tidal bore.

Bores in the Hugli River occur only with a greater than average spring tide, and usually when the seaward flow is augmented by freshets.

There is a considerable diurnal inequality in the tides of the Hugli River, the higher HW of spring tides occurring at night between October and March, and during the day between May and September. A bore is more likely to occur preceding the higher HW than preceding the lower HW. There is a seasonal variation in the probability of the occurrence of a bore. Extreme tidal bores are most prevalent in March and September and reach heights of 2.4 to 6.1m.

During the Northeast Monsoon, from November to February, freshets do not occur and for this reason, bores are a rarity. When they do occur during this particular season, it is likely to be at night. They are dangerous because they are unexpected. It is advisable to anticipate their occurrence during this season whenever greater than average spring tides are predicted.

With the Southwest Monsoon, the occurrence of freshets during greater than average spring tides will always cause bores, those preceding the daylight HW being higher than those at night.

The first appearance of the bore is on **Diamond Sand** (22°10'N., 88°10'E.), on the W side of the river abreast Diamond Harbor, where the ascending wave runs on as a breaking roller. It is not of much consequence until it enters the contracted reaches above Hugli Point, when, besides swamping boats, it affects vessels at anchor by causing them to run upstream, especially if there is a strong S breeze. The bore reaches a maximum at Chinsura, about 26 miles above Kidderpore Docks, and disappears about 14 miles farther up the river above Naya Serai.

Vessels at moorings surge and roll during the passage of the bore as there is a sudden lift of 1.2 to 1.8m; when bores are expected, springs must be put on the flood moorings close down to the buoys to relieve the jerk on the cable and bits. Vessels at anchor have been known to break their anchor chains during extreme tidal bores.

Depths—Limitations.—Bars, bends, and bores, known as the three B's, constitute the main dangers to shipping in the Hugli River. Numerous bars, with continuous fluctuating depths over them, encumber the winding channel of the river.

The river is high from June to October and during this period, vessels drawing up to 8.5m can reach Calcutta at HWS. Vessels drawing up to 7.9m can reach the port at HWN. From October to June, the river is low and the maximum permissible draft is 7.3m. Maximum drafts may vary from year to year according to the season, but vessels drawing up to 8.8m have ascended the river to Calcutta; special arrangements have to be made and the date selected by the Port Pilotage Office.

Vessels proceeding to Calcutta should arrive at the pilot station with drafts as close to an even keel as possible.

In some parts of the river, the changes in depths and the directions of the channels are very rapid and no attempt will be made to describe them or the navigational aids which mark them.

Although the charts may currently be correct, they can not be relied on to give an accurate presentation of the depths and dangers which may be encountered because of these rapid changes.

Signals.—Signal stations are situated near the lighthouse on Sagar Island, on the E bank at Diamond Harbor, and at Hugli Point, about 6 miles above Diamond Harbor. Diamond Harbor Signal Station is connected by telegraph, and the other stations are connected by telephone with Calcutta.

Haldia (22°01'N., 88°05'E.)

World Port Index No. 49555

7.7 Haldia, a subsidiary port and anchorage, lies on the W bank of the Hugli River about 56 miles downriver from Calcutta. An important secondary port; the oil port serves an oil refinery at Barauni, 280 miles NW by pipeline.

Extensive works are in progress to dredge and deepen the approaches, channels, and berthing areas. The results of dredging in shipping lanes are constantly reviewed to affirm permissible

drafts. Drafts are issued as the draft of the day and forecasted 6 weeks in advance.

Haldia Terminal Oil Jetty No. 1 and Haldia Terminal Oil Jetty No. 2 are situated 2.3 and 2 miles ENE of **Haldia Point** (22° 01'N., 88° 04'E.). Berth No. 1 has a berthing face of 91.5m and can accommodate tankers up to 90,000 dwt, with a maximum length of 238m. Berth No. 2 can accommodate tankers up to 150,000 dwt. Currents may exceed 5 knots.

It has been reported (1996) that shoaling has begun to limit the size of vessels able to use Berth No. 1.

The Haldia dock system is approached through a lock entrance at Haldia Point, with a least depth of 8.5m. Vessels up to 230m in length can utilize this entrance, which leads to a large turning basin and an enclosed dock extending about 900m NNE. There is a depth of at least 8.5m throughout the turning basin and dock system.

The E side, from S to N, provides ore, coal, and phosphate berths, with modern cargo handling equipment. A 235m finger pier projects S from the N head of the dock. This berth, which can accommodate vessels on either side, is utilized for the discharge of salt, sulfur, and fertilizer.

At the N end of the W side of the dock is a general cargo berth, with two container berths S of it.

LASH vessels are at present (1978) worked at the anchorage 0.3 mile S of the oil jetty.

Anchorage can be taken in mid-channel, in a depth of 11m, abreast of the port area over a bottom of medium to hard mud and sand, good holding ground.

A vessel has anchored in a depth of 12.8m, mud, with the anchorage lights in range 244° and Bagnapara Mark bearing 350° on the ebb and 339° on the flood. A good anchor watch is required because of the strong currents.

Two mooring buoys are available; vessels are required to secure to these buoys with unshackled anchor chains. Mooring takes place under the direction of the pilot and an experienced mooring crew is provided.

The maximum rate of the current in the river is about 5 knots, both on the flood and the ebb.

The pilot and the customs officer remain on board during the vessels stay at Haldia and accommodations must be furnished.

Diamond Harbor Anchorage

7.8 Diamond Harbor Anchorage (22°1'N., 88°11'E.) lies on the E bank of the Hugli River about 38 miles above Sagar Roads, and provides anchorage for large vessels, in depths of 11 to 23.8m. Because of the strong river current, at least five shots of chain must be used and a good anchor watch maintained. Mooring buoys are available for vessels requiring them.

Explosives destined for Calcutta are usually unloaded into special barges at this anchorage.

A signal and telegraph station and a customhouse are situated in the town.

An examination anchorage area is enclosed by a line joining the following positions:

- 22°11'30"N., 88°11'00"E.
- 22°11'30"N., 88°08'30"E.
- 22°11'00"N., 88°08'30"E.
- 22°11'00"N., 88°11'00"E.

Calcutta (Kolkatta) (22°33'N., 88°19'E.)

World Port Index No. 49560

7.9 The port of Calcutta extends from Budge Budge, about 21 miles above Hugli Point, to Konnagar, about 21 miles farther upriver, the limits being marked by boundary pillars. The port is about 83 miles above the entrance of the Hugli River, and about 128 miles from Eastern Channel Light Vessel, near The Sandheads.

The Howrah Bridge, about 15 miles above the downriver boundary of the port, crosses the river above Howrah Railway Terminus and is a steel cantilever structure, with tower on either side of the river which rises to a height of 91m. Several ferries ply across the river. The bridge marks the upper limit of navigation for ocean-going vessels.

Modern, well-equipped berthing facilities are provided for all classes of vessels alongside and at the mooring buoys in the river.

Calcutta, the second largest commercial port in India, is also the site of the largest city.

Port Authority of Calcutta

<http://www.portofcalcutta.com>

Tides—Currents.—Tides in the Hugli River at Calcutta are semidiurnal.

When regular, the flood runs 5 hours and the ebb runs 7 hours. During the Northeast Monsoon, the velocity of the current is 3 to 3.5 knots at springs and 1.5 to 2 knots at neaps. Between March and July, the velocity of the flood is increased and reaches a maximum velocity of 4 to 7 knots at springs. During the freshets, July to October, the flood is weak and of short duration and at neaps may be nearly imperceptible; the ebb during freshets has a maximum velocity of 7 knots at springs. Anchors are then quickly buried by the silt, so that sometimes it is necessary to slip the cable and leave the anchor to be picked up by the Port Commissioners. The tidal currents set fair up and down Calcutta Reach.

Depths—Limitations.—Mooring berths in the river have sufficient depths to accommodate any vessel that can enter the river. Depths at the moorings range from 5.5 to 15.2m, but vary according to their location in the river.

Kidderpore Docks comprise No. 1 Dock, No. 2 Docks, and a turning basin. The lock entrance from the river is 176.8m long and 24.4m wide. Vessels up to a maximum length of 157m and a beam of 21.3m can enter Kidderpore Docks. No. 1 Dock has 11 berths; No. 2 Dock has eight berths for general cargo and six coal berths. A depth of 9.1m exists alongside the berths in both docks.

Nataji Subhas Docks (King George Dock) lock entrance is 213.4m long and 27.4m wide. Vessels up to 172m may enter the dock. Seven berths, with a depth of 10m alongside, are available for ocean-going vessels. The other berthing facilities within the dock are for the sole use of lighters. In 1985, there were two container berths and cranes in Nataji Subhas Docks.

Garden Reach Jetties consist of five jetties for ocean-going vessels. Vessels, with lengths from 137 to 172m can be accommodated alongside.

Vessels berthed at Garden Reach Jetties are limited to a draft of 5.5m during bore periods.

Calcutta Jetties, which lie below Howrah Bridge, consist of nine jetties, but only five are available to ocean-going vessels.

The petroleum facilities at Buj-Buj (Budge Budge) consist of eight pontoon jetties. Vessels, with a maximum draft of 9.1m, can be accommodated alongside these berths.

Vessels mooring in the river are required to moor head stern, with two lower and stern cables shackled to the permanent moorings which are laid parallel with the banks.

Regulations.—Port Regulations are supplied to vessels on arrival by the harbor master.

Rules regulating the handling of explosives are issued by the port authorities. Masters of vessels with explosives on board are required to give an advance notice of arrival of 72 hours.

The Sundarbans to the Chittagong Coast

7.10 The Sundarbans, broken by many outlets of the Ganges, extends E from the entrance of the Hugli River for about 165 miles to the entrance of the Tetulia River, the W mouth of the Meghna River.

The Sundarbans, an extensive, heavily-wooded swampy area in the S part of the Ganges Delta, is intersected by many creeks and rivers. The more important rivers are the Matla River, the Raimangal River, the Malancha River, the Pussu Riverr, the Haringhata River, and the Rabnabad River. An intricate series of branches connect these rivers whose courses are continually shifting their positions. Boats can be piloted through the Calcutta Canals towards Kulna, about 65 miles to the E. Kulna is the most important center situated in the Sundarbans. The Meghna River, the E branch of the Ganges, discharges the main volume of the Ganges waters.

Depths—Limitations.—**Swatch of No Ground** (21°05'N., 89°17'E.) is a remarkable tongue-shaped depression lying S of the entrance of the Pussur River. The NE side of the depression is centered in about 21°24'N, 89°36'E. Depths around the perimeter of this depression decrease rapidly from 36.6m to over 183m within a distance of 1 to 2 miles along the N and NW sides, and to much greater depths in its central and S parts.

Swatch of No Ground ranges in width from 6 to 12 miles within the 183m curve and is about 50 miles long.

The 11m curve, like the 18 and 35m curves to the S, extends in a general E and W direction from a position about 25 miles S of the entrance of the Matla River to a position about 60

miles S of the mouth of the Hatia River. The 11m curve lies nearest to the coast about 11 miles S of the entrance of the Pussur River.

Those depths and dangers which lie within the 11m curve are described together with the principal description of the coastal features which they front.

East of Sagar Island is a series of low, alluvial, jungle-covered islands intersected by numerous creeks and rivers.

Saptamukhi Sand (21°20'N., 88°27'E.) and Bulcherry Sand, both with depths of 5.5m and less, extend about 28 and 20 miles S, respectively, from the shore. Reliable information about this part of the coast is scanty and the chart should be used with great caution. Changes on the SW part of the Sundarbans have been particularly rapid in recent years.

Lacams Channel (21°13'N., 88°24'E.), which lies close W of Saptamukhi Sand leads N into the Baratala River on the E side of Sagar Island. Saptamukhi Channel, which lies close E of Saptamukhi Sand and is the common entrance of the Jamira River on the E and the Saptamukhi River on the W. Ocean-going vessels cannot use the channels.

Signals.—Special storm signals, used on the rivers of the Sundarbans, are displayed at Namkhana, Barisal, Goalunda, Noakhali, Narayanganj, Chandpar, Mongla, and at some river police stations in Bengal, Assam, and Bangladesh; for further information, see the accompanying table.

The Matla River

7.11 The **Matla River** (21°37'N., 88°41'E.), about 34 miles E of Sagar Island Light, lies with its mouth between Dalhousie Island and Bulcherry Island. The river is entered through Eastern Channel and Western Channel, which are divided by a partly drying shoal known as Raimatla Sand (West Spit), about 10 miles S of Dalhousie Island. Shoals at the entrance are subject to change and, since pilotage is not available, caution is necessary in navigating these two channels and the Matla River.

Eastern Channel has least charted depths of 7.9 to 12.8m; Western Channel has least charted depths of 6.1 to 11m. Western Channel is preferred to Eastern Channel, but navigation is dangerous because the depths in the approach to the SW side of Dalhousie Island are fairly regular and the lead gives no warning of the proximity of the steep-to bordering sands. This condition also exists within the river.

Special Storm Signals—Rivers of the Sundarbans

Signal	Day	Night	Meaning
Cautionary Signal I	Black diamond	White light over red light	Squally weather threatens your area
Warning Signal II	Black ball	Red light	A storm may affect you shortly
Danger Signal III	Cone, point up	Two red lights displayed vertically	A storm will soon strike you
Great Danger Signal IV	Cylinder, displayed vertically	Three red lights displayed vertically	A violent storm will soon strike you

Tides—Currents.—The tidal currents below Dalhousie Sand appear to rotate; the flood current sets WNW at its commencement and works through N around ENE. The ebb current sets ESE through S to WSW. Velocities of the flood and ebb currents are 2 to 3 knots at springs and 1 to 1.5 knots at neaps.

In the channel, the flood current runs toward the E shore until abreast of Dalhousie River at the N end of Dalhousie Island, then it crosses S of Grappler Sand and runs toward Peel Point, forming eddies. It then runs N for about 8 miles to **Roger Point** (21°55'N., 88°40'E.) where it bifurcates, the greater portion going up Bidda River and the balance running around Roger Point into Katalli Bight, leaving slack water in the vicinity of Bidda River Point. The velocity of the flood current varies in different parts of the river, but 5 knots is the maximum velocity recorded.

The ebb current sets fairly down the river; off Roger Point it forms numerous eddies. At the last of the ebb, the current sets from abreast the N end of Dalhousie Island across the river toward Halliday Island. The maximum recorded velocity of the ebb current is 2.5 knots.

Aspect.—Clumps of trees lie on Dalhousie Point on the W side of the island of the same name. This point and Halliday Island to the NW, may be seen from a distance of 10 miles when the height of eye is about 7.3m. When close to Dalhousie Point, conspicuous when the sun is shining, appears as a high, white sandy beach.

Below Kattali, which lies 12 miles N of the N end of Dalhousie Island, the land is so low that at HWS the water runs some distance inland. From the sea to Eedoo Reach, about 23 miles above Kattali, the land is covered by dense jungle. Between this reach and Port Canning, about 8 miles distant, the banks are marked by villages.

7.12 Port Canning (22°19'N., 88°39'E.), about 60 miles above the entrance of the Matla River, is connected with Calcutta by railroad.

Anchorage can be taken off the port, in depths of 7.3 to 14.6m, but local knowledge is essential.

The coast between the Matla River and the Pusur River, about 50 miles to the E, is marked by the entrances of the Bhangaduni River, the Gosaba River, the Raimaugal River, and the Malacha River. All of these rivers are fronted by shoals which extend from 3 to 17 miles offshore.

Dalhousie Sand (21°24'N., 88°51'E.) extends about 17 miles SSE from Dalhousie Point.

Bhangaduni Island (21°33'N., 88°52'E.), which lies between the mouths of the Bhangaduni River and the Gosaba River, is fronted by Bhangaduni Sand, which extends about 17 miles SE from it. Both of these rivers have shallow entrances and are of no commercial value. The Raimaugal River and the Malacha River farther to the E are both shallow.

The Haribhanga River opens 12 miles ENE of the Gosaba River; the Raimaugal River is about about 4 miles E; both enter the sea through a common estuary which extends miles S. It has a least depth of 6.4m in its approach, but local knowledge is essential for entering.

New Moore Island is located on the W side of the main entrance channel to the Haribhanga River; the boundary between India and Bangladesh lies in the vicinity.

The Pusur River to Khulna, including the Mongla Anchorage

7.13 The Pusur River (21°46'N., 89°30'E.) is entered between Jefford Point and West Point, about 8 miles to the W. Zulfiqar Channel extends N from the bar which lies between these two points and joins the deep channel leading through the estuary to Akram Point about 15 miles to the N. This point lies at the junction of the Sipsah River and the Pusur River. Boar Point lies on the E side of Zulfiqar Channel about 5 miles N of Jefford Point. Hiran Point lies on the W side of the channel about 6.5 miles NE of West Point.

The Pusur River, between Akram Point and the anchorage off Mongla, is fairly broad and navigable 24 hours.

Vessels with a speed of less than 8.5 knots shall not be permitted to transit the river during springs. Under special circumstances, provided permission is granted, a tug will have to be hired from the port to assist a vessel within the port limits. Requests for a tug must be made at least 24 hours in advance. For reasons of safety, Mongla Anchorage is normally departed only on the flood. Deep-draft vessels depart on the first of the flood.

This coast must be approached with caution at all times and soundings taken continuously. Swatch of No Ground is a good aid for vessels coming from the W. The change in the water from blue or blue-green to a yellow color normally indicates the approach to shallow water. During the ebb at springs, yellow water is found as far seaward as Swatch of No Ground.

In 1985, lesser than charted depth was reported 17.5 miles SSW of Jefford Point.

Winds—Weather.—Haze generally prevails in the approaches to the low coast, except at the change of the seasons. Fog, off the coast and in the river, occasionally occurs during the change of seasons, but it usually lifts during the forenoon. In general, thick weather can be expected during the Southwest Monsoon from May to September.

At the anchorage off Mongla, vessels are required to have steam ready for meeting any emergency during northwester, March through May, and during the Southwest Monsoon. Northwester are usually directional as their name implies; they are storms accompanied by heavy rain and high winds, with velocities up to 30 to 40 knots. Northwester give about 2 or 3 hours notice, and vessels are usually advised in the day's weather forecast.

Tides—Currents.—Tides in the Pusur River are semi-diurnal. High water over the bar occurs about 1 hour before predicted HW for the river entrance.

Tide gauges lie on the river banks at Hiran Point, abreast Sundar Kota, about 9 miles above Akram Point, about 5 miles below Mongla, and about 1.5 miles below Chalna Bazar.

Tidal heights vary with the season, being lower in February and March and higher in July through November.

At the **Mongla Fairway Lighted Buoy** (21°27'N., 89°34'E.), 17.5 miles S of Jefford Point, the ebb sets about SSE and the flood sets NNW. The velocity of the current is about 2 knots at springs during the Northeast Monsoon. At the time of the Southwest Monsoon, the ebb is stronger and the flood is weaker.

In Zulfiqar Channel, the ebb flows at a velocity of about 3 knots at springs. The currents turn about 1 hour after high and

low water in the entrance of the Pusur River. Extensive rips and eddies mark the edges of Sarwar Sand and Dubla Shoal.

At the anchorage off Mongla the ebb has a velocity of about 4 knots at springs. The currents turn about 4.5 hours after HW and LW in the entrance.

A report states the currents turn in Zulfiqar Channel about 2 hours and at the anchorage off Mongla about 3 hours, respectively, after HW and LW in the entrance. The velocity of the ebb was reported to be 6 knots at springs at the anchorage off Mongla.

Depths—Limitations.—A bar, about 5 miles wide with a least depth of 5.5m, lies in the approach to the Pusur River between 5 and 10 miles S of the entrance. Lighted Buoy B1 to Lighted Buoy B10 mark both sides of the channel across the bar. A dangerous wreck, marked by a buoy moored close S, lies on the E side close S of the channel entrance.

Following pilot instructions, vessels drawing up to 7m may cross the bar in all seasons. During Southwest Monsoon, 7.8m draft may be permitted. The maximum permissible fresh water draft for Chalna Port is published each day in advance by the Chalna Port Authorities. Draft permitting, the bar can be crossed anytime both by day and night.

When crossing the bar during the Southwest Monsoon, vessels should have not less than 1.2m of water under the keel and not exceed a speed of 12 knots. During the Northeast Monsoon, a minimum clearance of 1m under the keel is considered a safe margin for crossing the bar.

The best time to cross the bar inbound is about 1 hour before HW in the entrance. Outbound vessels should cross the bar during the last 45 minutes of the flood. During the first stage of the ebb, the river level drops very rapidly.

The depths over the crossings inside the river range from 5.8 to 7m. Vessels with a fresh-water draft of 7.3m and vessels with drafts of 7.5 to 7.6m can enter the river during spring tides in September through December, and proceed as far as the anchorage off Mongla, about 48 miles above Jefford Point. Vessels with a maximum draft of 4.9m can proceed to Khulna, about 25 miles above Mongla Anchorage.

A dangerous wreck with exposed masts lies about 11 miles SSW of Jefford Point; close W of Buoy B5. Another dangerous wreck lies approximately 6 miles NW of Fairway Buoy.

Numerous fishing boats and nets have been reported in the vicinity of the river entrance.

Sarwah Sand (21°42'N., 89°28'E.), awash at HW, lies on the W side of Zulfiqar Channel with its N edge 4.5 miles S of Hiran Point. An unnamed sand, which dries in patches, lies about midway between Sarwah Sand and Hiran Point.

Dubla Shoal (21°46'N., 89°31'E.), with depths of less than 1.8m and patches which dry up to 0.9m, lies on the E side of the channel between Jefford and Boar Points.

Pavanga Shoal (21°51'N., 89°30'E.), with depths of less than 5.5m and a central drying area, lies on the W side of the main fairway with its S end about 1.5 miles SW of Boar Point. The S end of this shoal has been reported extending to the S. Less water has been reported in the channel W of the N part of Pavanga Shoal.

Aspect.—The terrain in the vicinity of the river is low and has no distinctive landmarks which can be seen from the offing. Land is not normally sighted until the outer bar is crossed. **Jefford Point Light** (21°44'N., 89°32'E.) is shown

from a gray, metal framed tower. Reports indicate that the entrance is a poor radar target.

The radiobeacon antenna, about 1.5 miles NNW of Hiran Point is reported to be a good landmark when approaching the entrance. Some white houses stand near this radiobeacon.

Hiran Point Light is shown from a grey, metal framed tower.

The entrance of the river, between the approach to the bar and the central part of Zulfiqar Channel, is normally buoyed and marked in places by light floats. Lighted Buoy Z2, Lighted Buoy Z3, and Lighted Buoy Z4 mark the fairway through Zulfiqar Channel. After the annual winter survey of the bar, the floating aids are moved to conform with the changes in the channel; replacement of aids is not always made.

During severe weather, the buoys are liable to be blown off station; their charted positions cannot always be relied on.

A lighted fairway buoy, equipped with a radar reflector, is moored about 20 miles SSW of Jefford Point. Within the river above the bar, the main fairway, as far N as Chalna Bazar, is well-marked by navigational aids. Some of these are equipped with radar reflectors.

Anchorage.—During the Northeast Monsoon, anchorage can be taken outside the bar, in depths of 7.3 to 9.1m, good holding ground, about 14.5 miles S of Jefford Point. Deeper water exists about 0.8 mile N of this position.

Unsheltered anchorage, with good holding ground, can be taken, in a depth of 8.2m, about 1.5 miles NE of Sarwar Sand Lighted Beacon.

A vessel should not anchor N of 21°47'N to avoid Pavanga Shoal.

Pilotage.—Pilotage is compulsory for vessels of 200 grt and over. Pilots board and depart vessels off the Fairway Light Float in good weather, or off Hiran Point in unfavorable weather. In adverse weather, if boarding is impossible off Hiran Point, the pilot vessel will lead incoming vessels up to Akram Point, where pilots will board in sheltered water. Pilot vessels are subject to be withdrawn without prior notice.

Vessels requiring a pilot should give 24 hours notice to the Mongla Port Authorities at Khulna and the pilot stations by radio stating their ETA at the Fairway Light Float, fresh water draft, speed available, vessel length, gross registered tonnage, flag of vessel, local agents, and quantity of fresh water required. On approaching the river, the vessel will receive instructions from the pilot station regarding the course to be followed and the depth of water on the bar. Vessels can cross the bar in daylight only, and should anchor 2 miles SE of Hiran Point and S of Lighted Buoy Z3 to await the pilot. The pilot vessel is radio equipped.

Vessels drawing over 5.2m draft are usually piloted over the outer bar on a flood, in which case the pilot vessel may rendezvous around 7 miles N of Fairway Buoy.

Regulations.—The Port Director at Khulna is to be notified 24 hours in advance of vessel's arrival as to the state of health on board and vessel's last port of call. Radio pratique may be granted. A report states that health officials board vessels about 7 miles below Mongla Anchorage (Chalna Anchorage). The port health officer is stationed at Khulna.

Caution.—In 1976, strict security measures were in force in the port area. A ban on bathing and swimming in the anchorage was strictly enforced.

Mongla Port Rules are used primarily by the pilots and port service organizations.

If repairs are to be made to a vessel at the anchorage and the work requires the immobilization of the vessel, permission should be obtained from the port authorities.

In 1994, many buoys in Zulfiqar Channel were reported missing or unlit. The 5m curve of Pavanga Shoal was reported to be extending S to Buoy B18; a shoal patch, with a least depth of 5.3m, was reported between Buoy B18 and Buoy B15.

7.14 Mongla Anchorage (Chalna Bazar) (22°28'N., 89°35'E.) ([World Port Index No. 49580](#)), the lighterage port for Chalna, consists of a river anchorage in the Pusur River, about 66 miles above Fairway Light Float and 9 miles downstream from Mongla Bazar. Vessels up to 6.9m draft may use the anchorage, and of slightly greater draft in the flood season. A wharf, 920m long and 61.3m wide, close N of Mongla Nala, has been completed. In 1981, alongside depths to 7.9m was being dredged along the wharf.

The anchorage area stretches along the river for about 3 miles and has depths which range from 6.4 to 13.7m. Several swing moorings are available. One of the vessel's chains is made fast to a buoy with the assistance of a mooring tug. Vessels can also anchor in midstream at nine additional anchorage berths. The holding ground is good. All cargo is discharged into lighters and transferred to Mongla.

To prevent dragging anchors when a strong ebb is running, especially during the Southwest Monsoon spring tides, it is advisable not to moor more than two large or four average-size lighters alongside a vessel.

Hazardous cargo can be discharged about 5 to 6 miles below the anchorage.

Tugs are available for handling the lighters.

Storm signals are displayed for the Bay of Bengal from the signal tower on the E side of the river at Mongla.

Old Chalna Anchorage, about 9 miles above Mongla Anchorage, extends about 1 mile below Mongla Bazar and has a least depth of 3.8m. In 1974, the maximum draft allowed at Mongla was 7.3m. This site was found to be unsuitable because moored vessels were frequently set adrift by the strong freshets and eddies. Ocean-going vessels no longer use this anchorage.

Five new berths, with a total length of 920m and an alongside dredged depth reported (1997) to be 6.1m, stand on the E bank of the Pusur River, about 2 miles N of the anchorage off Mongla.

Directions.—From a position close E of Fairway Lighted Buoy, steer N for about 3 miles to the buoyed channel entrance. This buoyed channel should be followed, according to radioed instructions, to the anchorage area about 1.3 miles SE Hiran Point Light.

No vessel should attempt to cross the outer bar without a pilot on board. If the pilot is unable to board at the fairway buoy, the vessel should wait until detailed instructions are received by radio. At this time navigational aids, depths, and pilotage information should be verified. Mongla pilots emphasize that all instructions received over VHF are repeated by the Master to ensure understanding.

When entering or leaving, Dubia Shoal Lighted Buoy should be passed to the W and the lighted buoys off Sarwar Sand and Pavanga Shoal should be passed to the E.

Vessels are required to display their call sign by International Code Signal Flags when entering port and while at the anchorage off Hiran Point awaiting a pilot.

7.15 The Haringhata River (21°50'N., 89°57'E.), one of the principal outlets of the Ganges, is entered through an estuary about 7 miles wide at the entrance. Tiger Point lies on the W side of the entrance, about 17.5 miles NE of Pusur Point.

The river is navigable by ocean vessels as far inland as Morreigani, about 37 miles from the entrance, and throughout its entire course by the largest native boats. Navigation of this river is said to be easier than that of any other river at the head of the Bay of Bengal, as the river is free from tidal bores and mid-channel dangers.

The river should not be entered without local knowledge or a pilot aboard.

Tidal currents within the river are reported to exceed a velocity of 4 knots at springs.

Caution.—A bar, with a LW depth of about 4.6m, fronts the mouth of the Haringhata.

Argo Flat (21°44'N., 89°57'E.), an extensive area of shoal ground with depths of less than 5.5m, lies between Pusur Point and Landfall Point, about 30 miles ENE. The flat extends up to 19 miles offshore and dries in patches up to 8 miles S of Tiger Point. Heavy breakers have been observed over these patches.

Morreigani, a local rice exporting center, lies on the river bank about 37 miles above the entrance. Local river steamers frequent the port.

Good holding ground and shelter is provided at the anchorage in the river abreast of the town.

Rabnabad Channel Entrance (21°50'N., 90°16'E.) lies about 8 miles ENE of Landfall Point. The narrow channel within the entrance has a least charted depth of 4.3m in its N part, which lies between the westernmost Rabnabad Island and the mainland to the W. Above this island, the channel connects with the Ganges River through the Kaja River and the Tetulia River. Little is known of these latter two rivers.

An area between the S point of the E Rabnabad Island and a position about 18 miles to the E, has not been surveyed. A similar unsurveyed area lies N of a line extending about 50 miles ENE from the S point of the E Rabnabad Island to a position about 6 miles E of the SE point of **South Hatia Island** (22°15'N., 91°05'E.).

Meghna Flats (21°30'N., 90°24'E.), an area of shoal ground with depths of 5.5m and less, lie between the entrance of the Haringhata River and the entrance of the Shahbazpur River, about 60 miles to the NE. These flats and shoals extend up to 45 miles S of the mouths of the Meghna River.

D'Apres Shoal (22°00'N., 91°09'E.), a drying sand bank with a 2.4m depth, lies on the E side of the entrance of the Shahbazpur River, about 14 miles S of the SE point of South Hatia Island.

7.16 Sandwip Island (22°28'N., 91°29'E.), the furthest E, is one of the largest of the numerous islands which lie between the entrances of the Meghna River.

Several shoal spurs, with depths of 5.5m and less, extend up to 22 miles S from South Hatia Island and extend irregularly NE to a position about 15 miles S of Sandwip Island. In 1979, less water than charted was reported 35 miles S of South Hatia Island. Two detached shoals, with depths of 2.4 and 5.5m, lie in the entrance of the narrow channel on the W side of Sandwip Island, about 6.5 and 7.5 miles S of the SW point of that island.

Tides—Currents.—The velocity of the tidal current in the vicinity of D'Apres Shoal is about 4 knots.

During the first 30 minutes of the flood, there is always a swell in depths of 9.1m and less.

About 40 miles SW of D'Apres Shoal the tidal current continues to run N and NE for 1 hour after HW and SSW and SW for 1.5 hours after LW. During spring tides the tidal currents set N and S and at neaps they gradually turn in a clockwise direction. Tidal currents setting more to the W than the E are experienced during good weather. The estimated velocity of the ebb current at springs is from 4 to 6 knots and at neaps about 2.5 knots.

Depths—Limitations.—The Meghna River discharges the main volume of the waters of the Ganges River and the Brahmaputra River through its four principal mouths (the Tetulia River, the Shahbazpur River, the Hatia River, and Sandwip Channel). The Brahmaputra River joins the Ganges River at Goalunda; the combined waters enter the Meghna River at Chandpur. In 1979, the banks S of the entrances to these two rivers were extending S and less water was reported.

The Hatia River, the only navigable passage of the Meghna River, passes between Sandwip Island on the E and the Hatia Islands group to the W. Sandwip Channel, between Sandwip Island and the mainland coast to the E, is closed by sandbanks N of the N end of Sandwip Island.

Vessels, with a draft of 3m, can proceed upriver as far as Narayanganj.

In 1964, Hatia Channel, the navigable entrance of the Meghna River, had its entrance about 9 miles SE of the S extremity of Sandwip Island. The buoyed channel leading from the entrance extends NW and W to a position midway between South Hatia Island and North Hatia Island.

Depths in Hatia Channel and over the adjoining shoals are subject to rapid changes, and the buoys may be moved to conform to these changes. Extreme caution is advised.

Directions cannot be given because of the rapid changes in the depths and no one without local knowledge or a pilot aboard should attempt to enter. Pilots are available at Chittagong.

Anchorage.—Anchorage can be taken off the W side of Sandwip Island, abreast of the village of Sandwip or in Sandwip Channel E of that island. A shallow flat extends about 6 miles S of the island. Authority Lighted Buoy is moored about 9.5 miles SE of Sandwip and 2.5 miles SSW of a dangerous wreck. The lighted buoys marking the S approaches to Hatia Channel are moved as the channel changes.

Caution.—Sandwip and the Hatia Islands are particularly subject to flooding by storm waves.

A stranded wreck lies approximately 7 miles off the mainland coast at the S end of Sandwip Channel.

A dangerous wreck, marked by a lighted buoy, is situated 10 miles SE of the S end of Sandwip Island.

Chandpur (23°09'N., 90°33'E.), a small river port frequented by local steamers, lies at the junction of the Meghna River and Chandpur Khal. The port has little commercial value.

Narayanganj (23°37'N., 90°32'E.), a small river port and transshipment point, lies about 8 miles SE of Dacca on the left bank of the Lakhya River near its junction with the Meghna River. Local steamers frequent the port.

Chittagong Coast to Elephant Point

7.17 The coast of the Chittagong District extends S from the Feni River for about 150 miles to the Naf River, the boundary between Bangladesh and Burma, which lies about 5 miles NE of St. Martins Island. The Feni River empties into Sandwip Channel about 8 miles N of the N extremity of Sandwip Island. Between the entrance of the Karnaphuli River and Cox's Bazar, the coast is broken by Kutubdia Island and Maiskhal Island. South of Cox's Bazar to Elephant Point, low hills rise close inland and cliffs mark the coastline. Chains of mountain ranges rise parallel with the Chittagong Coast at varying distances inland.

Winds—Weather.—During the Northeast Monsoon, from October to March, small fog banks or thick mists occur on the Chittagong Coast on an average of 2.5 days a month. These weather conditions cause the lights in some instances to assume a deep red color and in other instances to completely obscure them.

Tides—Currents.—The tidal currents in this part of the Bay of Bengal set N and S with the trend of the coast; the velocity at spring tides ranges from 4 to 6 knots. In hazy weather, vessels have been swept past the entrance of the Karnaphuli River by the flood or N current and set upon the sands S and SW of Sandwip Island, without sighting Kutubdia Island Light by night or the land by day.

Depths—Limitations.—Off the Chittagong coast the depths decrease gradually from the 36.6m curve, about 22 miles W of **Elephant Point** (21°11'N., 92°03'E.), to the 11m curve about 15 miles SSW of the entrance of the Karnaphuli River. With but few exceptions, all of the known dangers which lie off this section of coast are contained within the 11m curve.

7.18 Dolphin Shoal (21°51'N., 91°46'E.), with a least depth of 6.4m, lies between 3.3 and 5 miles WSW of **Kutubdia Light** (21°52'N., 91°51'E.). A shoal, with a least depth of 8.2m, lies about 7 miles WSW of the lighthouse.

North Patches (21°43'N., 91°44'E.), a group of hard, sand shoals with depths of 4.1 to 5.5m, extend about 8 miles S from a position about 7.5 miles SW of Kutubdia Light. Less water than charted may exist over these shoals.

A narrow shoal bank, about 4.5 miles long with a least depth of 9.4m, lies centered about 23.8 miles SSW of Kutubdia Light.

South Patches (21°26'N., 91°40'E.), a narrow shoal bank with a least depth of 9.1m, lies centered about 28 miles SSW of Kutubdia Light.

Reju Shoal (21°17'N., 91°59'E.), small in extent with a least depth of 4.9m, lies about 7 miles NNW of Elephant Point.

In 1977, the shoal was reported to be 0.5 mile NW of its charted position.

A detached 14.6m patch lies about 25.8 miles NW, and a similar detached patch lies 27.5 miles WNW of Elephant Point.

Kohinur Shoal (21°07'N., 91°38'E.), with a least depth of 21.9m, was reported to exist about 23.5 miles W of Elephant Point.

Caution.—The greatest care is necessary in making the entrance of the Karnaphuli River. Whatever the state of the weather or the time of the year, but especially during the Southwest Monsoon from April to September, mariners should exercise extreme caution, being cognizant of the depths and dangers.

Even with favorable weather and when a vessel's position is known, strict attention to the depth as well as to the course and distance made good over the ground is necessary.

If the position is doubtful and there is a strong flood or N current, it is well to avoid being set on the shoals lying off Sandwip Island and the entrance of the Meghna River. These shoals may lie farther S than indicated on the chart.

When approaching from the SW and uncertain of a vessel's position, a landfall can be made in the vicinity of the conspicuous white cliffs about 4 miles SSE of Cox's Bazar.

Vessels should pass outside of South Patches, North Patches, and Dolphin Shoal. Soundings should be taken frequently and allowances made for tidal currents.

Sitakund Mountain (22°38'N., 91°41'E.) rises to an elevation of 352m, about 20 miles NNW of Chittagong. A ridge of hills extends SSE from this mountain and roughly parallels the coast for about 18 miles. Nagarkha, 88m high, lies about 17 miles SSE of Sitakund Mountain. Fakir Hill, 73m high, lies about 1 mile farther S at the S end of the ridge close N of Chittagong. A black pillar, 6.1m high, lies atop this hill.

From a position along the coast E of the N part of Sandwip Island, a white sandy beach borders the shore for about 27 miles SSE to the mouth of the Karnaphuli River.

Approach to the Karnaphuli River

7.19 The entrance of the Karnaphuli River lies between **Patenga Point** (22°13'N., 91°48'E.) and Normans Point, about 2 miles SSE.

Tides—Currents.—About 0.5 mile W of the outer bar at the entrance of the Karnaphuli River, the flood current sets NNW and the ebb current sets SSE. The tidal current turns about 1.5 hours after HW and LW near Juldia, and 1.3 hours after HW and LW at Chittagong. The ebb current is very strong during the rainy season from April to September. Under ordinary conditions, the velocity of the tidal current is about 2 knots at neaps and 3 to 4 knots at springs.

The mean range of the tide at Chittagong is 2.9m; the spring range is 3.6m.

Depths—Limitations.—On the W side of the approach to the entrance of the Karnaphuli River from the SSW, depths of less than 9.1m lie SE of Meghna Flats and S of Sandwip Island.

Dangers on the E side of the approach consists of South Patches, North Patches, Dolphin Shoal, and the 8.2m shoal, all of which have been previously described in [paragraph 7.18](#).

In 1984, the stranded wreck of a coastal sailing vessel, with masts visible, was reported to be lying 5 miles offshore, 7.5 miles SSW of Patenga Point.

Aspect.—**Patenga Point** (22°13'N., 91°48'E.), on the N side of the entrance of the Karnaphuli River, is low, flat, and marked by a few trees. A drying sandy mud flat extends about 0.5 mile SW from the point. Lights in line, bearing 037°, lie approximately 0.5 mile NE of Patenga Point, but are reportedly difficult to distinguish. A dangerous wreck lies close NW of the leading line 2.5 miles SW of Patenga Point.

Normans Point (22°12'N., 91°49'E.), a low extremity of the coast, lies on the S side of the entrance of the Karnaphuli. Extensive mud flats lie between this point and the entrance of the river. The outer part of these flats dries. Middle Island lies in the center of these flats, about 0.8 mile NNE of Normans Point. The greater part of the island is awash at HWS, during the Southwest Monsoon.

Normans Point Light shows from a red and white framework tower, 1.3 miles S of Normans Point; a racon is located at the light. A disused light lies 0.2 mile WSW of the light.

Four Tree Hill, 38m high and topped by trees, lies 2.5 miles ENE of Normans Point. From a distance, the hill appears to form the S end of a tableland of which Juldia Hill, about 1.5 miles NNW of Four Tree Hill, is a part. A flagstaff and some radio towers lie on Juldia Hill.

Coombs Pillar (22°15'N., 91°51'E.), a white mark 9.1m high, stands on the highest part of the ridge, about 0.8 mile N of Juldia Hill.

A conspicuous flare is situated about 2.3 miles N of Patenga Point.

Pilotage.—Pilotage is compulsory for all merchant vessels. The river entrance is constantly changing and no vessel should attempt to enter without a pilot on board. The following information should be sent to Chittagong 72 hours and confirmed 24 hours in advance of arrival:

1. Vessel's ETA at Kutubdia and Chittagong outer anchorage.
2. Date and hour of departure last port of call.
3. Nature and quantity of cargo to be discharged.
4. Maximum fresh water draft on arrival. The arrival draft should be forwarded in writing if it is expected to be within 0.2m of the maximum permissible draft.

The pilot launch is stationed off Juldia and is equipped with radar and VHF radiotelephone.

Vessels should arrive at the pilot station at least 3 hours before the daylight HW. Priority vessels should arrive at least 6 hours prior to daylight HW.

Vessels with a speed of under 7 knots will not normally be handled during spring tides.

Vessels are usually boarded about 1 mile SW of the outer bar lighted buoy. The harbor master boards in the river, about 0.5 mile below the SW extremity of the railway jetties and take vessels to their assigned berth.

Pilots are available only from sunrise to sunset.

Signals.—A signal station lies on Juldia Hill and is equipped with radiotelephones and facilities for signaling by the International Code of Signals, on a 24-hour basis.

Storm signals are displayed on Juldia Hill and at Normans Point; the [Indian General System](#) is used.

Weather signals will be displayed from the Port Commissioner's Office for inland vessels and small craft.

All vessels entering or leaving port should display their signal letters.

Anchorage.—Three anchorage areas, lettered A through C, lie off the entrance of the Karnaphuli River. Anchorage A and Anchorage C have least charted depths of 9.7m. Anchorage B has a least depth of 8.2m. Anchorage A is for vessels with a draft of over 9.1m. Anchorage B is for vessels entering within 24 hours. Anchorage C is for lightering and other vessels not scheduled to enter for 24 hours. The limits of these three areas, together with the prohibited anchorage area, can best be seen on the chart. An obstruction lies on the NW limit of Anchorage C.

North of a bearing of 055° on Patenga Lighted Beacon, the holding ground is soft mud and vessels are liable to drag. The mud is firmer farther S of this bearing, but attention should be given to the strong ebb which is experienced here especially during the Southwest Monsoon. A vessel using this anchorage should note the way it swings at the change of the tide, because it is liable to swing in one direction only. Vessels anchor should be sighted at regular intervals to avoid fouling.

A vessel reported anchoring in a depth of 10.5m with Normans Point Light bearing 109°, distant 2 miles, good holding ground. During a stay of 11 days at this anchorage, the maximum current experienced was 5 knots.

During spring tides, a vessel reported good holding ground with Patenga Lighted Beacon bearing 070° and Normans Point Light bearing 120°.

An abandoned submarine pipeline extends 1.5 miles WSW from a position about 2.5 miles NW of Patenga Point. Anchoring is prohibited in this vicinity.

A dangerous wreck lies 5.5 miles NW of Patenga Point; a lighted buoy is moored 0.5 mile NE of this wreck. Two more dangerous wrecks lie at approximately 4 miles NW of Patenga Point.

Caution.—Small fishing craft without lights, and fish nets marked by small black and white stakes, were reported to be a hazard to vessels approaching the river entrance.

The channels and depths in the Karnaphuli River and its approaches are subject to frequent change. Aids to navigation are adjusted accordingly. Consult the harbormaster at Chittagong for the latest information.

Chittagong (22°19'N., 91°49'E.)

World Port Index No. 49590

7.20 Chittagong, one of the leading ports in Bangladesh, lies on the W bank of the Karnaphuli River, about 10 miles above its entrance. Ample, modern berthing facilities are provided for all classes of vessels capable of crossing the river bars.

Chittagong is a first port of entry.

Winds—Weather.—Chittagong is in the track of cyclones and as a result, the port has been damaged on numerous occasions.

A hot, sultry day followed by still air conditions in the evening usually results in thunderstorms. The peculiarity of these storms is that they approach from the N and W in the form of a line squall accompanied by intense lightning, thunder, rain and/or cyclonic rotation winds which may reach a velocity of upwards of 50 knots. When signs of such a storm exist, masters must exercise great caution. Vessels at fixed moorings and

pontoon jetties must exercise extreme caution when a storm is blowing.

In general, rainfall is heavy during the Southwest Monsoon; dense fogs occasionally occur. Early morning fogs, clearing by mid-morning, also occur from December through February and sometimes in March. The fine weather period is from the middle of October to March.

Tides—Currents.—The tidal currents set across the outer part of the bar with the flood setting NNW and the ebb to the SSE.

During the Southwest Monsoon season, in the months of June to September and sometimes in October, strong freshets are experienced at which time there may be no flood current for several days. During freshets the velocity of the current increases to 6 to 8 knots. Notices regarding them are circulated well in advance by the local port authorities.

During the Southwest Monsoon, the spring range of the tide is about 6.1m; the neap range is about 2.7m. During the winter the spring range is 2.7 to 4m and the neap range is 1.5 to 2.4m.

Tide gauges, marked in 3-inch divisions, lie on the sides of the river at various locations to assist in determining the level of the tides.

Tidal signals are displayed from a tidal semaphore station on Juldia Hill. The signals indicate, by day, the height of water above tidal datum. The diagram (See Tidal Semaphore Signals for Calcutta in [paragraph 7.6](#)) shows the position of the semaphore arms and their meanings, as viewed from a vessel approaching from seaward.

A black ball is displayed on top of the semaphore at HW, and dropped when the tide has fallen 3 inches below HW level.

Vessels approaching the outer bar, in order to be certain the rise of tide as indicated by the semaphore, will not display a black ball at the foremast head.

Tidal lights for night pilotage are displayed from two framework masts, each 49m high. Three lights, vertically displayed, 5.5m apart and displayed from each mast, indicate the rise of the tide in feet and inches. These lights are visible both from the jetties and outside the outer bar.

Depths—Limitations.—Outer Bar lies at the seaward end of the entrance range and has a least depth of about 4.6m. The least charted depths over the Inner Bar and Gupta Crossing are 5.5 and 4.9m, respectively. Depths over the bars and in the river are subject to constant change.

The maximum safe fresh water drafts in the Karnaphuli River may range from 5.5 to 8.5m, depending on the time of the year and local conditions. In general, the greatest depths are available in the summer and the least in the winter.

A monthly forecast of drafts is published by the port authorities. Daily maximum anticipated safe drafts in the Karnaphuli River for the months can alter with prevailing winds and unusual siltation. Local authorities should be consulted to affirm maximum permissible draft for the day, generally referred to as fresh water draft.

Ship movements generally commence about 4 to 5 hours before the day's HW. Outbound ships of light draft sail on the first daylight flood; ships with the maximum draft for a particular day sail about 2 hours before daylight HW.

Vessels entering or leaving port must have full steam on main engine and deck, and both anchors with full lengths of chain must be available for use at all times.

A confused and dangerous sea breaks on the outer bar during strong SW winds.

To determine the draft for entering or leaving port, the depth of 3.6m over the inner bar is added to the height of water in the tide tables, allowing for an error of 30.5 to 35.6cm, depending on the phase of the moon and season.

A deep-draft vessel, intending to discharge cargo, may gain a 7.6 to 15.2cm draft advantage by entering close to time of HW and berth, whenever practicable, on the ebb current.

A 1965 report states the water salinity at the outer anchorages changes from almost salt water to practically fresh water, depending on the tide. This causes corresponding differences in vessels' drafts and is important in that maximum drafts are based on fresh water. Pilots check drafts of deeply-loaded vessels. It was further reported that due to siltation, the channel for crossing the bar is a sharp zigzag and the usual extra draft allowances, such as 3 inches for vessels of less than 152.4m in length and a speed of over 14 knots, are not granted.

The alignment of the fairways, with the best water over the bars and within the river, are denoted by lighted range beacons.

The lighted beacons, indicating the fairway in the entrance and over the outer bar, are in line bearing 037°04'.

Lighted and unlighted buoys mark the channel limits and some of the sunken wrecks in the river. The range beacons and buoys are moved as necessary to conform to depth changes in the channel.

The port has 17 jetties, including two pontoon jetties. Vessels having a length of 167 to 186m, with the day's permissible draft, but not exceeding 8.5m, berth at Jetty No. 1 to Jetty No. 13. Vessels having a length of 164m, with a maximum draft of 8.5m, are berthed at Jetty No. 14 and Jetty No. 15. Vessels up to 164m in length, drawing the day's permissible draft, are berthed at Jetty No. 16 and Jetty No. 17.

There are nine river mooring berths, of which two have pontoons for supporting pipelines. The largest berths can accommodate vessels of up to 186m in length.

Jamuna Oil Jetty is situated 0.5 mile upriver of Gupta Khal No. 9. The draft limits at the jetty vary seasonally with tide from 7.9 to 9.4m.

Two container berths, with a draft of 10m alongside, are situated on the W bank of the river, 1.5 miles above Jamuna Oil Jetty.

An offshore oil terminal is situated about 4.8 miles NW of Normans Point. The deepest draft that can be accommodated is 10.4m. A special pilot is required to place the tanker alongside the terminal buoy.

Two ocean-going tugs and a sufficient number of barges are available for handling cargo at the anchorages off the river entrance.

Explosives are handled at the outer anchorage. Safety explosives can be handled alongside the jetties.

A vessel entering on the flood normally turns off the assigned berth using the starboard anchor; after turning, the anchor is weighed and the vessel proceeds to either a berth or mooring buoy using the port anchor.

Aspect.—The entrance of the river lies between a training wall on the W side, which retains a sand and mudflat extending about 0.5 mile SW from Patenga Point, and a stone apron on the side which is the SW extension of Juldia Training Wall.

Mudflats and Middle Island lie SE of the stone apron and Juldia Training Wall. The stone apron and training walls at the entrance of the river have been reported to be submerged at HW.

The outer bar fronts the entrance of the river about 1.5 miles SW of Patenga Lighted Beacon. The inner bar lies about 2.5 miles within the entrance and W of Juldia Hill. Gupta Bar is about 5 miles above the river's entrance.

About 1 mile NNW of Normans Point, the E bank of the river curves NE for a distance of 2.5 miles to a position NW of Juldia Hill. Large mudflats lie along this part of the bank and embankments have been constructed to prevent inundation. Several small villages are situated on this section of the bank. About 2.3 miles farther N, the E bank becomes low and swampy and is cultivated.

Mud islands (chars), the largest of which are Gupta Island and Lukia Island, are part of this bank and low-lying land to the E. Back Channel Khal and a passage for boats at half tide separate Gupta Island and Lukia Island, respectively, from the mainland to the E.

The W bank of the Karnaphuli trends NE from Patenga Point for about 3 miles to **Gupta Point** (22°17'N., 91°50'E.). Active Spit, the greater part of which is enclosed by a training wall, lies between the W bank and the training wall, E through S of Gupta Point. Numerous creeks (khals) intersect the W bank of the river for a distance of about 4 miles between Gupta Point and the jetties at Chittagong.

Two high tension power line pylons, 105m high with obstruction lights, lie one on each side of the Karnaphuli River, 2 miles SW of Sadarghat. The overhead clearance under the power line is 52m.

In 1981, a quay, 342m long, and a dry dock to accommodate 16,500 dwt vessels, were near completion on the W bank, 1.8 miles WNW of Gupta Point. In 1984, construction was started on two multi-purpose jetties to provide 450m of additional wharfage, with a depth of 10m alongside.

Pilotage.—Pilotage is compulsory and available during daylight hours only. Contact the pilots on VHF channels 16 and 12. Vessels should arrive at the Pilot Boarding Ground, 1 mile SW of Outer Bar Lighted Buoy, at least 3 hours before high water.

Regulations.—Vessels are advised to report any incidents of piracy and armed robbery to the Port Radio Control on VHF channel 12.

Anchorage.—Vessels can anchor temporarily in certain reaches of the river on their way to or from Chittagong. However, there is only swinging room at or near HW, and then only with the assistance of the engines. Vessels cannot remain at anchor at low water.

Vessels with plague or other infectious diseases on board must anchor off Coombs Pillar until inspected by the Health Officer.

Caution.—Piracy remains a concern at Chittagong. The port was reported to have the second highest number of piracy incidents in 2001. Armed attacks from small boats can occur in Chittagong Anchorage or in the harbor. In addition, vessels have reported a high incidence of theft of zinc anodes from vessel hulls and rudders. Mariners are advised to keep a sharp lookout.

Normans Point to Elephant Point

7.21 The Chittagong Coast from the entrance of the Karnaphuli River extends about 66 miles S and SSE to Elephant Point. A group of deltaic islands, separated by shallow channels, lie about midway between the river and the point.

Between Normans Point and the N point of the Sangu River, about 5.5 miles SSE, the low coast is wooded and marked in places by small sand hills.

The N entrance point of the river is marked by low sand hills and a clump of trees. The river is entered about 3 miles S of this point, but is available only to large native boats.

South of the mouth of the Sangu River the coast is low, wooded, and marked by low sand hills. About 7 miles S of the Sangu River, the coast recedes at Cuckold Point. A drying mudflat extends up to 2 miles offshore along this section of coast.

Cuckold Point has been reported to be a good radar target up to 24 miles.

Kutubdia Island (21°51'N., 91°52'E.), which lies with its N end about 1 mile SW of Cuckold Point, is low, flat, covered with trees, and is about 12 miles long. The island is visible for about 8 miles.

Kutubdia Island has been reported to be a good radar target up to 16 miles.

Anchorage.—Anchorage can be taken, in a depth of 12.8m, with Kutubdia Island Light bearing 068°, distant 1 mile. The anchorage is fairly well protected, but the currents are strong. Approach to this anchorage should be made from N of Dolphin Shoal.

A channel, about 30 miles long in a N-S direction, lies between Kutubdia Island, Maiskhal Island, and Sonadia Island on the E and Dolphin Shoal, North Patches, and South Patches on the W. Depths in the channel range from 10 to 31.1m. Tidal currents set through this channel at a high velocity and it should not be attempted without local knowledge.

Maiskhal Island (21°37'N., 91°56'E.) lies SE of Kutubdia Island, Matarbari Island lies in between them.

7.22 Kutubdia Channel (21°44'N., 91°52'E.), a narrow passage with depths of 4.3 to 11m, lies between Kutubdia Island and the mainland. Channel depths are subject to rapid changes and cannot be relied on.

Maiskhal Island is marked by a range of hills about 91.4m high near its central part. Garamchari Hill is not distinctive as the range is of uniform height. Low hills lie along most of the E side of the island, whereas, the other sides are low. Maiskhal Bluff, 61m high and conspicuous, lies near the SE extremity of the island. A marshy flat extends up to 3 miles offshore S of the Matarbari Channel entrance.

Sonadia Island (21°29'N., 91°53'E.), about 2 miles SSW of Maiskhal Island, is marked by low, white sandhills. A flat, which dries in places, extends about 3 miles from the island. With a flood current the sea breaks heavily over this flat.

Lattadia Island (21°35'N., 91°51'E.), which dries 1.5m, lies about in the middle of the marshy flat which fronts the W side of Maiskhal Island.

Maiskhal Channel (21°30'N., 91°59'E.), which lies between the E side of Maiskhal Island and the mainland, is narrow with rapidly changing depths. This channel should not be attempted.

Rupadia Sands (21°27'N., 91°57'E.), bare in places with shallow depths elsewhere, extend up to 2.3 miles S of the SE end of Sonadia Island. These sands lie on the W side of the entrance of Maiskhal Channel.

7.23 Cox's Bazar (21°27'N., 91°58'E.), which consists of a small town and export center, lies about 4 miles S of the SE extremity of Maiskhal Island. The town lies on a low range of sand hills on the mainland and on the SW bank of the Baghkhal River. This river discharges into Maiskhal Channel about 1.5 miles N of the town. Cox's Bluff, about 0.5 mile S of the town, rises steeply to an elevation of 48m. Twin casuarina trees, both conspicuous, lie almost 0.5 mile NE of Cox's Bluff. Cox's Bazar Light is shown from a gray, metal framework tower on a white concrete building on Cox's Bluff; the light structure is topped by a conspicuous orange dome, and is fitted with a radiobeacon and racon.

A spit, which dries in patches, extends about 2.8 miles W and 3.5 miles WNW from Cox's Bluff. The sea breaks heavily over this spit, especially during the flood tide.

The principal channel leading into Maiskhal Channel lies between the spits extending from Cox's Bluff and S from Sonadia Island over a shifting bar about 3 miles W of Cox's Bluff. In 1960, there was a least depth of 2.1m in this channel.

Another channel crosses the spit extending S from Sonadia Island, but the depths are shallow.

There are usually heavy rollers off the entrances of both channels and the bars break occasionally. Depths in these channels are subject to rapid changes.

A shoal, composed of sand and mud with depths of less than 1.8m and which dries in places, lies on the NW side of the fairway of Maiskhal Channel about 0.5 mile S of **Hamidardia Island** (21°30'N., 91°57'E.).

The Baghkhal River, which enters Maiskhal Channel about 1.5 miles S of the E end of Hamidardia Island, is narrow and shallow and dries in places.

Deep-draft vessels can anchor S of the entrance of the main channel, in a depth of 9.1m, sand and mud, with Cox's Bluff bearing 055°, distant 3 miles.

Light-draft vessels can anchor in a depth of about 5.5m, sand and mud, with Cox's Bluff bearing 043°, distant about 2.3 miles.

Vessels capable of crossing the bar can anchor off the mouth of the Baghkhal River in Maiskhal Channel, in depths of 9.1 to 18.3m, mud.

Reliable pilots are not available and the bar and channel should be examined and buoyed before entering, because they are subject to change during the monsoon. The best time to enter is at about half flood when the breakers will mark the edges of the shoals.

The coast between Cox's Bazar and Elephant Point, about 15.5 miles SSE of Cox's Bluff, is backed by low hills.

Red cliffs, about 61m high, line the coast from 3.5 to 6.5 miles SSE of Cox's Bluff. South Cliff, the S cliff, is 82m high. From offshore these cliffs appear white when the sun is shining on them, and on a clear day they may be visible up to 20 miles.

These cliffs are a good landmark for vessels approaching Chittagong from the S.

Waila Taung (Sugarloaf Hill) rises to a height of 413m about 11 miles ENE of Elephant Point.

Elephant Point to Thames Point

7.24 Cape Negrals lies about 333 miles SSE of Elephant Point. The intervening coast is irregular and broken by the many rivers which discharge their waters into the E side of the Bay of Bengal. Hills and mountain ranges back the coast at varying distances inland, generally lying parallel to the coast in a N-S direction. Mayu and Arakan Yoma are the principal mountain ranges. Ramree Island and Mun Aung Island, the largest islands along this section of coast, lie about midway between Elephant Point and Cape Negrals. Combermere Bay and Hunters Bay indent the coast N of Ramree Island. Akyab is the most important port, although Kyaukpyu is of some importance.

Winds—Weather.—The weather and climate of Burma is primarily influenced and determined by the Northeast Monsoon and the Southwest Monsoon and the short transitional periods between them. The year is divided into four seasons, referred to as the Northeast Monsoon (winter monsoon, cool or dry season), the spring transitional or hot season, the Southwest Monsoon (summer monsoon, wet or rainy season), and the autumn transitional season.

The Northeast Monsoon, December through March, is marked by fine weather with very little rainfall.

The hot season, April and May, is an interim period of weak and variable winds prior to the Southwest Monsoon. Increases in rainfall in April and May do not equal the amounts of rainfall during June through August; this results in greater heating of the air masses.

The Southwest Monsoon, June through September, is characterized by cloudiness, overcast skies, light rain almost daily, interspersed with rain squalls or thunderstorms accompanied by torrential downpours. Restricted visibility, high humidity, and general adverse weather conditions are associated with the Southwest Monsoon.

The autumn transitional season, a period of weak and variable winds with land and sea breezes prevailing, occurs in early October after the withdrawal of the Southwest Monsoon and before the cooler, drier weather of the Northeast Monsoon is established in late November.

Tropical storms with destructive winds occasionally affect the coastal regions N of 15°00'N.

Tropical cyclones, which develop in the Bay of Bengal, occur most frequently during the transitional season. The Arakan Coast of Burma is more likely to be struck by a cyclone during the autumn transitional season than at any other time, but rarely is the Gulf of Martaban affected. During the hot season some tropical cyclones cross the coast of the Gulf of Martaban.

Tides—Currents.—The monsoon winds affect and influence the surface currents. To a great extent the currents are variable and at the height of each monsoon, currents may sometimes be met setting in the opposite to the monsoon current, or in general in any direction. The currents are still more variable during the transition periods of the monsoons. The

Northeast Monsoon tends to produce a seasonal current setting to the W; the Southwest Monsoon a similar current setting to the E in the open waters of the Bay of Bengal.

Tidal currents along the Chittagong Coast S of Elephant Point set parallel with the coast, with the flood setting N and the ebb setting S.

Tidal currents along the Arakan Coast set N on the flood and S on the ebb; they are greatly influenced by the immense volume of tidal backwater. Local drafts of the current are strong during the flood and the outset is small during the ebb.

Depths—Limitations.—The 35m curve is not defined off the coast between Elephant Point and a position about 18 miles WSW of the entrance of the Mayu River. From the above position, the 35m curve extends SE to a position about 18 miles WSW of Thames Point on the W side of Ramree Island. The 35m curve lies within 10 miles of the W side of the NW extremity of Ramree Island and about 16 miles WSW of the entrance of the Kaladan River.

The 18m curve lies about 7 miles W of Elephant Point and 3 miles W of the W side of Ramree Island. Southwest of the entrance of the Kaladan River, the 18m curve is defined in an irregular pattern lying between 15 and 7 miles off the entrance. Southeast of the entrance of the Kaladan River, the 18m curve lies near the shore in the proximity of the W side of Myengun Kyun (West Boronga Island) and Boronga Point, the island's S extremity.

Between Boronga Point and Ramree Island, depths within the outer 36.6m curve W of Combermere Bay and in the approach to Kyaukpyu Harbor are irregular.

Numerous islands, reefs, rocks, and shoals lie seaward of the coast up to 16 miles offshore between Elephant Point and Thames Point.

Shore dangers which lie within the 9.1 and 11m curves are described under the principal description of that section of coast which they front.

Mud volcanoes occasionally rise from the sea off the coast between the entrance of the Kaladan River and Mun Aung Island. Many of these exist only temporarily and disappear, leaving a shoal. Mariners should keep a constant and careful lookout, as it is not possible to keep their existence charted.

7.25 The **St. Martins Islands** (20°37'N., 92°20'E.), a group of one island and two islets, lie between 5.5 and 9 miles SSW of Shahpuri Point, the N entrance point of the Naf River. North Tall Trees, a group of casuarinas, lie at the N end of the large island and a similar clump of trees lie near the S end. Sunken dangers extend up to 1 mile offshore along the W side of the island. Depths between St. Martins Islands and the mainland are less than 9.1m. St. Martins Island Light is shown from a gray metal framework tower on a white concrete building near the N end of the island. Red and white daymarks are fixed to the top of the light structure which is also fitted with a racon.

Anchorage.—Sheltered anchorage can be taken about 0.5 mile E of the N end of the large island, in a depth of 7.3m, good holding ground. In the approach to the anchorage, the best water lies E and S of St. Martins Islands.

7.26 **St. Martins Reef** (20°37'N., 92°13'E.), a 4 mile long ridge of sunken rocks, lies about 10 miles WSW of Shahpuri Point. A rock, awash, lies on the S part of the reef. Depths

elsewhere on the reef range from 0.9 to 10.5m. The sea breaks over the reef in heavy weather or with a S swell.

North Delay Shoal (20°30'N., 92°15'E.), a small patch of hard ground with a least depth of 6.9m, lies about 6.5 miles SW of the S extremity of St. Martins Islands.

South Delay Shoal (20°28'N., 92°15'E.), with a least depth of 9.7m, lies about 2 miles S of North Delay Shoal. This shoal should not be crossed because lesser depths may exist.

Sitaparokia Patches (20°32'N., 92°26'E.), a group of shoal patches with depths of 2.7 to 9.1m, lies centered about 5.3 miles SE of the S St. Martins Islands.

Asirgarh Shoal (20°28'N., 92°28'E.), small and rocky with a depth of less than 1.8m, lies about 6.5 miles SW of **Sitaparokia** (20°33'N., 92°32'E.) which is on the mainland. During heavy weather and at LW, the sea breaks over this shoal. A detached 9.8m patch lies about 1.5 miles WNW of Asirgarh Shoal.

Oyster Island (20°12'N., 92°32'E.), low, sandy, and almost devoid of vegetation, lies about 12.5 miles WSW of Foul Point. This island lies on the E side of a rocky ledge from which foul ground extends about 1.5 miles NNW and 3.5 miles SE.

A flagstaff, Mayu Light, some buildings, and low trees lie on the NE side of the island. A stranded wreck lies in shoal water about 2 miles SSE of Oyster Island. A dangerous wreck lies about 6 miles NNE of Mayu Light.

Taylor Shoal (20°15'N., 92°25'E.), with a least depth of 7.8m, lies about 8 miles WNW of Oyster Island. Vessels should avoid this shoal because lesser depths than charted may exist.

Oyster Reef (20°05'N., 92°39'E.), about 1.8 miles in extent, lies centered about 9 miles SE of Oyster Island. The least charted depth is 1.8m, but lesser depths have been reported to exist. A heavy sea breaks over this reef during bad weather or when a swell sets in.

The red can buoy moored about 1.8 miles S of Oyster Reef is withdrawn from May 1 to November 1.

7.27 Heckford Patch (19°57'N., 92°44'E.), with a least depth of 9.7m, lies about 18.5 miles SE of Oyster Island. Vessels should not attempt to cross this danger. **Prain Daung** (20°01'N., 92°57'E.), bearing 080°, leads N of, and bearing 060°, S of Heckford Patch.

A patch of discolored water was reported to exist about 8 miles SW of **Borong Point** (19°49'N., 93°02'E.). A depth of 16.5m, whose existence is doubtful, was reported to exist about 13.5 miles SW of the same point.

Shoal water and breakers have been reported in an area 8 to 9 miles S of Borong Point. A mud volcano was reported to have existed in this area.

The Terribles (19°24'N., 93°17'E.), three groups of rocks, lie on the S side of the W approach to Kyankpyu Harbor, between 8 miles WNW and 10.5 miles WSW of **Saddle Island** (19°26'N., 93°27'E.).

North Terrible (19°27'N., 93°16'E.), 3.7m high, is the N rock of the group. Drying rocks lie within 1.8 miles N and a rock, awash, lies about 0.5 mile S of it.

Middle Terrible, 4.3m high, lies about 1.3 miles SW of North Terrible. Isolated drying rocks lie 1.5 miles WNW and 1 mile SSW of Middle Terrible.

South Terrible (19°23'N., 93°16'E.), almost 3 miles SSW of Middle Terrible, consists of several low rocks, the highest being 3.7m.

South Rock, which dries 1.8m, lies about 1.5 miles S of South Terrible. The sea breaks between South Rock and South Terrible.

Volcanic disturbances have been reported to have occurred about 3.3 miles NNW of North Terrible. Less water than charted may exist in this area.

A shoal, with a depth of 7.8m, lies about 4.5 miles SW of North Terrible. This shoal, which is the remains of a mud volcano, was marked by discolored water and should be avoided.

7.28 Irrawaddy Rock (19°25'N., 93°23'E.), which dries 0.6m, lies about midway between Middle Terrible and Saddle Island. Depths within a 0.5 mile radius of this rock are less than 11m. The rock is hard to make out with a smooth sea. A breaking shoal lies about 0.3 mile ENE of Irrawaddy Rock. A mud volcano was observed about 3.8 miles S of Irrawaddy Rock.

Research Rock, a sunken reef with depths of 1.8 to 8.2m, lies about 3 miles SSW of **West Point** (19°22'N., 93°28'E.) on the NW extremity of Ramree Island.

Elephant Point (21°11'N., 92°03'E.), about 9.5 miles S of South Cliff, is backed by Elephant Point summit, a conspicuous 124m high hill, visible on a clear day for about 20 miles. Stranded wrecks lie 13 miles WNW and 9 miles SW of the point.

Elephant Point has been reported to be a good radar target up to 35 miles.

The coast between Elephant Point and the entrance of the Naf River, about 33 miles SSE, is formed by the W side of the Naf Peninsula. The peninsula terminates to the S in Shahpuri Island, which is low, flat, and covered with jungle growth. Shahpuri Point, the S extremity of the island, is the NW entrance point of the Naf River.

Taungnyo Hill (21°04'N., 92°12'E.), 267m high and the highest peak on the Naf Peninsula, lies about 11 miles SE of Elephant Point. A conspicuous peak, 253m high, lies about 9 miles farther SSE.

East of the Naf Peninsula the Mayu Range rises to heights of 332 to 670m. Wetkyein Tauno, 460m high, rises at the N end of the Mayu Range, about 19 miles E of Elephant Point.

7.29 Shahpuri Flat (20°43'N., 92°18'E.), composed of mud and sand with depths of 5.5m and less, extends S from the shore about 9 miles NNW of Shahpuri Point to a position about 5 miles SW of the point. A heavy breaking sea usually exists over this flat in depths of 3.7m and less.

The **Naf River** (20°43'N., 92°22'E.) is entered between Shahpuri Point and Cypress Point, about 1.5 miles to the SE. The entrance can be identified by the high trees which lie in the vicinity of the entrance points.

The tidal currents set across the approach to the bar, with the flood setting to the N and the ebb to the S, at velocities of 0.8 to 1 knot at spring tides. The tidal currents run mainly fair in Patricks Gut. In the Naf River, the tidal current runs full at velocities up to 4 knots. There is little or no river current.

Cypress Sands (20°40'N., 92°18'E.) consist of a number of shallow ridges, some of which dry, which lie on the flat extending about 4 miles SW from Cypress Point. Depths are less than 3.7m. Their location is marked by breakers.

The bar which obstructs the river entrance lies between Shahpuri Flat and Cypress Sands.

In 1960, the least charted depth over the Shahpuri Flat part of the bar N and NW of Cypress Sands was about 3.2m. The least depth in Patricks Gut and in the deepest channel between the ridges of Cypress Sands was about 2.4m at MLWS

In 1960, charted depths of 5.5 to 14.6m existed up to 12 miles above the entrance of the Naf River. In 1966, it was reported that considerable shoaling had taken place within the river.

Two buoyed channels lead across the bar to the river entrance. The SE channel leads in a N direction through Patricks Gut and then through Cypress Sands. The NW channel leads in an E direction and lies N of St. Martins Islands and Cypress Sands.

Anchorage can be taken, in a depth of 8.2m, off Maungdaw, about 7 miles above the entrance of the Naf River.

Vessels should approach the entrance of the SE channel (Patricks Gut) by passing S and E of St. Martins Islands. Patricks Gut, close S of Cypress Sands, is sheltered from the swell and passage should be possible during the Southwest Monsoon. The approach to the entrance of the NW channel should be made from the NW, passing N of St. Martins Reef and St. Martins Islands. A mid-channel course should be steered in the river.

Local knowledge or the services of a pilot is essential to enter the river.

Between Cypress Point and Foul Point, about 34 miles SE, the numerous sharp peaks of the Mayu Range back this section of coast from 1 to 6 miles inland. Fakirmura Hill, 133m high and conspicuous, lies at the SE end of this range about 3 miles NW of Foul Point.

7.30 Mount Todd (20°23'N., 92°42'E.), 338m high, lies about 4.3 miles NNW of Fakirmura Hill, and when seen from the W appears flat-topped and slightly higher than the peaks on either side. When viewed from the S, it appears as a conspicuous sharp peak.

Agandu Hill, 192m high with a pagoda on its summit, lies 7 miles ENE of Fakirmura Hill. Pimple Hill, 107m high, lies about 1.5 miles SE of Agandu Hill.

Bengara Hill, 414m high, rises about 19 miles NE of Fakirmura Hill. This conspicuous hill, when open S of the latter hill, is easily identified.

Sitaparokia (20°33'N., 92°32'E.), a small conical hill 65m high, with the ruins of a temple on its summit, lies on a point 13 miles SE of Cypress Point. A conspicuous rock, 36.6m high and shaped like a chair, lies about 183m offshore 0.5 mile NW of Sitaparokia. A rock, with a least depth of 3m, lies about 1.8 miles offshore and almost 2 miles S of Sitaparokia.

A flat, with depths of less than 5.5m, extends from a position close offshore, about 8 miles NW of Foul Point, to a position about 7.5 miles SSW of the point where it terminates in North Spit.

The **Mayu River** (20°13'N., 92°45'E.) is entered between Foul Point and Mayu Point, about 3.5 miles SSE. The river has

been surveyed for a distance of about 13 miles above Foul Point and flows almost due S. A long narrow shoal, with depths of less than 1.8m and which dries in places, divides the river into two channels. This shoal extends from 1.5 miles NNE to almost 9 miles N of Foul Point. Kazidiya Kyun, an island covered by mangroves, lies at the N end of the shoal with a drying spit extending almost 3 miles S from it. About 4 miles N of Mayu Point, the Kywede River, flowing from the E, joins the Mayu River within its entrance.

The tidal currents at the bar have a velocity of about 2.5 knots at springs and 1.5 knots at neaps. The flood sets NNE and the ebb in the opposite direction.

The tidal currents within the river attain a velocity of 3.5 knots at springs.

The bar obstructing the river entrance has a least depth of 5.8m and lies between North Spit and South Spit, about 4.5 miles SW of Mayu Point.

Dangers on the NW side of the entrance include North Spit, Martini Sands, and Burne Rocks. Between Foul Point and Burne Rocks, about 1.5 miles to the S, there are numerous patches and rocks which dry from 0.6 to 2.4m.

7.31 Burne Rocks (20°15'N., 92°45'E.), one of which is above-water, with the rest drying in places. Two small islets lie between these rocks and Foul Point.

Martini Sands (20°13'N., 92°44'E.), which extend about 3 miles S and SSW from Burne Rocks, are subject to constant change and are marked by breakers.

On the SE side of the entrance, a flat with depths of 5.5m and less, extends about 4 miles SW from Mayu Point. Mayu Spit lies on the inner part of this flat; South Spit lies on its outer edge.

Depths inside the bar increase from 5.8m to over 9.1m and increase to depths of 16.5 to 20.1m W of Mayu Point.

The E channel within the river E of Kazidiya Kyun and the shoal extending S from that island had a least depth of 5.5m in past years. The channel W of the island and the shoal had a least depth of 5.8m.

The E channel is obstructed by fishing stakes, but it is easier to navigate. The entrance of the W channel is narrower and dangerous.

Depths of 9.1 to 12.8m lie in the fairway of the Kywede River up to 4 miles above its entrance.

It has been reported that considerable shoaling has taken place in the E channel within the Mayu River NE of Foul Point and at the junction of that river and the Kywede River.

Good anchorage can be taken, in depths of 11 to 18.3m, in the fairway E of Burne Rocks. Anchorage can also be taken in the channel which lies between Foul Point and the shoal about 1.3 miles to the E.

Anchorage can also be taken in the Mayu River abreast of the town of Rathedaung, about 12 miles N of Foul Point or in a position about 2.3 miles S of the town.

A distant bluff, in line bearing 001° with a wooden pagoda atop an 82m elevation, leads across the bar between North Spit and South Spit. The pagoda, which is difficult to make out, lies almost 0.8 mile E of Fakirmura Hill. When Bengara Peak is in line bearing 032° with Pimple Hill, this course should be steered until Mayu Point bears 158°. Course should then be altered to the N so as to pass about 0.8 mile E of Burne Rocks.

Fakir Point (20°07'N., 92°54'E.) lies on the NW side of the entrance of the Kaladan River, about 10 miles SE of Mayu Point.

The entrance of the Kaladan River lies between Fakir Point and Savage Island, about 1.5 miles to the S.

Sittwe Harbor (20°08'N., 92°54'E.) lies just within the entrance N of Fakir Point.

The harbor area has been reported to be a good radar target up to 17 miles.

Vessels are prohibited from entering Sittwe Harbor between sunset and sunrise.

Sittwe Harbor (Akyab Harbor) (20°08'N., 92°54'E.)

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7.32 Sittwe Harbor, the chief port and administrative center of the Arakan Division of Burma, lies on the W bank of the Kaladan River, close N of Fakir Point and is the oldest rice exporting center in the country.

Vessels anchor to work cargo from barges or berth at the main wharf abreast of the city.

Sittwe Harbor is a first port of entry.

Winds—Weather.—The Southwest Monsoon begins early in May and lasts until the end of October, during which period the rainfall is so heavy as to almost inundate the country. The rivers become swollen at this time. Vessels do not normally load in Sittwe during this period.

The Northeast Monsoon, from November to April, is very dry. During the winter months, thick fog may be expected with the flood tide.

Tides—Currents.—Tides in the entrance of the Kaladan River and at Sittwe are semidiurnal. The tide rises and falls quickly with slack water lasting about 1 hour during springs and from 2 to 3 hours during neaps.

During the rainy season, the mean level of the Kaladan River rises about 0.6m.

The tidal currents are regular and rapid at springs; overfalls form on the ebb running between Fakir Reef and Passage Rock. The velocity at springs on the outer bar is from 0.8 to 2 knots, but between Fakir Point and Passage Rock the velocity is 3 to 4 knots, and during the Southwest Monsoon as much as 7 knots. During neaps, the tidal currents are very weak.

The tidal currents set directly across Fakir Reef, and a vessel leaving an inner anchorage when the ebb current is running will be set towards the reef after passing Fakir Point.

Vessels entering the harbor during the flood current, when in the vicinity of White Rocks, require careful navigation as the current sets directly towards the rocks. When leaving the harbor on the ebb current, vessels should keep as close to White Rocks as practicable to prevent being set on Horseshoe Shoal.

Depths—Limitations.—The outer bar lies between the W coast of Myengun Kyun, located SE of Fakir Point, and the tongue-shaped spur of Horseshoe Shoal, which lies about 4 miles S of Fakir Point. In 1984, the least depth over the bar was 6.4m; with. During the Southwest Monsoon, vessels crossing the outer bar should have 0.9 to 1.2m of water under their keels because of heavy swells.

The inner bar lies within the entrance of the Kaladan River, between the mainland N of Fakir Point and the SW end of Flat Island Spit. In 1976, the bar had a least depth of 4.9m. Silting is a problem because of inadequate dredging facilities.

North of the Main Wharf, which lies in the inner harbor about 1.8 miles N of Fakir Point, channel depths range from 6.1 to 9.1m.

Main Wharf, about 1.5 miles N of Fakir Point, consists of a T-head pier with a berthing length of 98.8m across the outer face. The main wharf can accommodate vessels up to 99m in length and up to 4.9m draft at the T-head pier.

Supplemental berthing facilities consist of the Naval Pier at Fakir Point; Stone Pier, about 0.3 mile S of Main Wharf; and the oil pier, about 1.5 miles N of Main Wharf.

A tanker berth, 152.4m long, lies about 1 mile S of Main Wharf. A pipeline extends to the shore from this berth.

Five vessels moored to their own two anchors can be loaded simultaneously to drafts of 6.4m in the inner harbor.

Vessels moved from the inner harbor to the outer harbor can be loaded to a draft of 7.9m.

Horseshoe Shoal (20°05'N., 92°51'E.), a large body of shoal water with depths of 5.5m and less, extends about 5 miles SE from Fakir Point and then about 3.8 miles E, as a narrow tail about 1 mile wide. During the Southwest Monsoon, the sea breaks heavily over the outer part of this shoal.

Passage Rock, Savage Island, Peaked Rocks, and White Rocks lie on the E side of the fairway between 1.5m and 2.5 miles S of Fakir Point. Passage Rock, 4.3m high and the outermost danger, is bordered by deep water on all except its E side. A disused lighthouse lies on the NW point of Savage Island.

Fakir Reef (20°06'N., 92°54'E.), topped by drying rocks, extends almost 0.5 mile SSE from Fakir Point.

Saunders Shoal (20°07'N., 92°56'E.), a detached 5.5m patch, lies in the fairway about 2 miles ENE of Fakir Point.

Flat Island (20°11'N., 92°58'E.), low and brush covered, lies in the middle of the river about 5.3 miles NE of Fakir Point. Paw Kyun, a similarly-covered island, lies close N of Flat Island.

Flat Island Spit (20°10'N., 92°57'E.), an extensive mud shoal which dries in places, extends about 4.3 miles SW from the S side of Flat Island. The inner bar leading into Sittwe Inner Harbor lies between the SW end of this spit and the shoal bank extending E from the mainland.

Aspect.—**Fakir Point** (20°07'N., 92°54'E.), the NW entrance point of the Kaladan River, is low and marked by two conspicuous radio masts, a lookout tower, and a lighthouse. The disused lighthouse on Savage Island, on the E side of the fairway, is a useful landmark. A depth of 5.5m lies 0.8 mile SSE of Fakir Point.

Myengun Kyun (20°00'N., 92°58'E.), a high densely-wooded island about 17 miles long, lies S of the entrance of the Kaladan River about 2 miles SE of Fakir Point. Prain Daung, a high tableland located about 4 miles SSE of the N end of the island, rises to a height of 293m. This tableland is conspicuous from seaward, except when viewed from the SSE, where it is obscured by a high mountain. The latter appears as a sharp peak when viewed from the S, but as a saw-toothed ridge when viewed from the W. It has no conspicuous summit. Two prominent hummocks, 106 and 137m high, lie near the N end of the island.

South Hummock, a conspicuous 73m high hill, lies near the S end of Myengun Kyun. This hill is a good landmark when viewed from the W.

A conspicuous white pagoda stands on a low hill about 1.5 miles N of Boronga Point, the S extremity of the island. Pagoda Summit, 225m high, backs this low hill and the white pagoda.

Pilotage.—Pilotage is compulsory for all vessels.

Licensed Burmese pilots are stationed at Fakir Point where the lookout tower is situated. Pilots board from a white launch, displaying the usual signals, about 4 miles S of Savage Island.

Port authorities must be notified 48 hours prior to a vessel's ETA.

In the event no pilots are available, a vessel should anchor about 3.5 miles SSW of Hodge Point until one can be obtained.

Regulations.—As silting may have occurred, it is advisable to obtain information prior to anchoring.

Signals.—Storm and weather signals are displayed at Sittwe; the [Indian Extended System](#) is used.

Anchorage.—Temporary anchorage can be taken outside the outer bar, in depths of 12.8 to 14.6m, between 3.8 and 4 miles S of Savage Island. During the Southwest Monsoon, this anchorage may not be practicable.

When necessary, vessels can anchor in the outer harbor outside of the inner bar. Good anchorage berths lie N of Saunders Shoal Buoy, in depths of 6.7 to 9.4m. The ebb tide, which runs at a considerable rate in this vicinity, may cause vessels to drag their anchors. It is recommended that eight shots of chain be veered when anchoring anywhere within Fakir Point.

Cargo vessels usually anchor close offshore, in the inner harbor W of Flat Island Spit between the Main Wharf and Charugyea Chaung. Vessels drawing less than 5.5m can anchor abreast of the hospital, about 0.3 mile S of the Main Wharf.

Anchorage is prohibited in the area lying between the tanker berth and the shore.

Directions.—Deep-draft vessels approaching from the W during the Southwest Monsoon should steer 091° for Prain Daung on Myengun Kyun, which leads between Oyster Reef and Heckford Patch to the entrance range over the outer bar.

The beacon on White Rocks, in line bearing 350° with Savage Island Light, leads over the outer bar. A course of 330° should be steered from a position about 1.3 miles S of the beacon on White Rocks, which leads about 0.5 mile W of this beacon and about 0.3 mile W of Peaked Rocks. When W of Savage Island, course should be altered to pass 0.3 mile NW of Passage Rock and then a course of about 060° will pass about 0.3 mile SE of the buoy moored off Fakir Reef, which leads to a position with Fakir Point Light bearing 315°, distant 1 mile. Course should then be altered to the N between Fakir Point and Saunders Shoal, and thence to the inner bar or to the anchorage in outer harbor.

The strong S and W set of the ebb tidal current must be allowed for; vessels should be well kept up after passing the buoy off Fakir Reef and before turning toward the inner bar or the anchorage.

7.33 Boronga Point (19°49'N., 93°02'E.), the S extremity of Myengun Kyun, has a narrow ledge of rocks extending about 1 mile S from it. Some of these rocks dry.

The broken and irregular coasts between Boronga Point and Ramree Island, about 35 miles SE, is deeply indented by Hunters Bay and Combermere Bay.

Peinnechaung Kyun (19°57'N., 93°05'E.), a high and thickly-wooded island, lies 1 to 6 miles E of Myengun Kyun and roughly parallel to it.

Research Strait (19°58'N., 93°02'E.), which lies between Myengun Kyun and Peinnechaung Kyun, provides sheltered passage to small craft with local knowledge, especially during the Southwest Monsoon. The S end of the strait is deep, but shoals rapidly toward the N end. A shoal, with a least depth of 6.1m caused by a mud volcano, lies in the S part of the strait about 2.3 miles ENE of Boronga Point.

A chain of small islands, rocks, and foul ground extends about 7 miles SSE from the S End of Peinnechaung Kyun. Painaisa Island, 58m high, and Conspicuous Rock, 9.1m high, are easily distinguished. Bingham Rock, which dries, lies at the S end of the chain.

Painaisa Island has been reported to be a good radar target up to 14 miles.

Ingrinchaung Kyun, inconspicuous from seaward, lies about 3.5 miles E of and parallel to Peinnechaung Kyun. Linlok Kyun, a small island 80m high, lies close SE of the S end of Ingrinchaung Kyun. A chain of above and below-water obstructions extend about 4 miles SE from Linlok Kyun.

Hunters Bay (19°55'N., 93°19'E.), entered between Linlok Kyun and Kyunthaya about 9 miles SE, is shallow over most of its area and has no commercial value to ocean shipping.

Kyunthaya (19°43'N., 93°27'E.), bold and high, rises to an elevation of 262m at its NW end, the most conspicuous part of the island.

7.34 Retkamauk Taung (19°48'N., 93°28'E.), a conspicuous peak 480m high, lies about 4.5 miles NE of the NW end of Kyunthaya. In clear weather, this peak is sometimes visible for 45 miles when viewed from the S.

Combermere Bay (19°37'N., 93°29'E.) is entered between Kyunthaya and the N point of Nakhaungbauk Kyun, about 6.5 miles to the S. Nasapo Kyun, 111m high and conspicuous, lies about 2.3 miles SE of Kyunthaya. This wedge-shaped island makes a good landmark. Naungdaw Kyun, 1 mile E of Nasapo Kyun, attains an elevation of 256m in the conspicuous cone-shaped summit of Seppings Peak. The peak slopes gradually on its SE side.

Black Rocks (19°38'N., 93°29'E.), which dry 2.4m, lie in the entrance of Combermere Bay about 2.8 miles SSW of the SE extremity of Kyunthaya.

Many islands, islets, and shoals lie within the entrance of Combermere Bay. Only native craft attempt to enter it as a rule, because of these dangers and intricate channels.

Temporary open anchorage can be taken, in depths of 12.8 to 16.5m, mud with good holding ground, off the entrance of Combermere Bay.

A shoal, with depths of 9.1 to 11m, lies between 5 and 8 miles NW of Nakhaungbauk Kyun.

7.35 Kyaukpyu Harbor (19°27'N., 93°34'E.) is situated between Tankharo Island, on the S side of Combermere Bay, and the N side of the NW end of Ramree Island. The harbor provides sheltered anchorage. The town of Kyaukpyu lies on

the N shore of Ramree Island. Fletcher Hayes Strait leads E from the harbor, E of Ramree Island, and then SE to Ramree Harbor, about 32 miles distant. Only boats use this passage.

The tides in Kyaukpyu Harbor are semidiurnal.

The velocity of the tidal current ranges from 1 to 3 knots. Seaward of Saddle Island, the flood sets N and the ebb sets S, frequently with considerable velocity. At neaps, the currents are very weak. Between the islands, the currents follow the directions of the channels.

Tankharo Island (19°30'N., 93°32'E.), long, narrow, and thickly wooded, lies about 1.5 miles SE of Nakhaungbauk Kyun and separates Combermere Bay from Kyaukpyu Harbor. Wood Harbor, a small inlet, lies close N of the NW end of Tankharo Island.

An extensive shoal area, with depths of 11m and less, extends about 2.5 to 4.3 miles W from the N half of the Island.

Kyaukpandu (19°29'N., 93°30'E.) lies about 2.3 miles SSW of the NW extremity of Tankharo Island and is 25m high. The rock, conical-shaped and topped by two sharp points close together, occasionally has its seaward side white washed which makes an excellent mark. The S and W sides of the rock are steep-to.

North Shoal (19°28'N., 93°30'E.), a small rocky patch, part of which dries, lies about 1.5 miles SSE of Kyaukpandu.

Giles Bank (19°28'N., 93°27'E.), small in extent with a least depth of 6.7m, lies about 2.8 miles WSW of Kyaukpandu and is the outermost danger on the N side of the entrance of Kyaukpandu Harbor.

Sinbaikchaing and Ledaung Kyun, two small islands, lie close W of the N half of Tankharo Island. The N island is low, whereas the S island is high. A small pagoda stands at the NW end of a ridge of hills on the N island.

Squadron Rocks, low and covered with scrub growth, lie close off the SW end of Sinbaikchaing.

Laws Island (19°26'N., 93°37'E.), 158m high and covered with foliage, lies in the E part of Kyaukpyu Harbor, about 0.8 mile SE of the S extremity of Tankharo Island. A shoal spit extends about 1 mile W from the NW side of Laws Island.

7.36 Saddle Island (19°25'N., 93°27'E.), located on the S side of the entrance of Kyaukpyu Harbor, rises to two rounded summits near its N end. This island lies about in the middle of a narrow area of shoal ground about 2.8 miles long and 0.7 mile wide. A group of drying rocks lie on a shoal about 1.5 miles S of the S end of Saddle Island. Bowman Passage lies between this latter group of rocks and the foul ground extending S from Saddle Island. A detached 5.5m patch lies about in the middle of the passage, 1.3 miles S of the S end of Saddle Island.

Dicey Shoal (19°27'N., 93°27'E.), over which the sea breaks heavily, lies at the N end of the foul ground extending N from Saddle Island.

Dickenson Channel, with depths of 14.6 to 20.1m, lies between Irrawaddy Rock and the foul ground which extends W from Saddle Island.

Helen Passage (19°24'N., 93°27'E.), the channel between Saddle Island and Ramree Island, is unsafe because of the numerous reefs and rocky patches which foul it. A close approach to Saddle Island should not be made from any direction.

Cap Islet, 45m high and conspicuous, lies about 1.5 miles SE of the S end of Saddle Island. Knot Islet, about 1 mile NNE of Cap Islet, is low with some scrub growth. Both islets lie on an area of foul ground which extends about 1 mile WNW and 1.8 miles NW from **Adams Point** (19°24'N., 93°29'E.) on Ramree Island.

Adams Point, the NW extremity of Ramree Island, is low and backed by a ridge of hills. Mount Peter, 101m high, lies about 0.5 mile E of Adams Point.

The coast between Adams Point and Georgina Point, about 3 miles NE, and then to Dalhousie Point 2 miles farther E, is bordered by several beaches and rocky points.

The NW end of Ladies Ridge, about 0.8 mile long, lies with its N edge about 0.5 mile S of Georgina Point. Conspicuous from the W are some trees lying at an elevation of 66m, near the NW end of the ridge.

Bombay Shoal (19°26'N., 93°31'E.), a rocky foul area with a least depth of 2.7m, lies at the outer edge of an area of foul ground extending from the coast almost 0.8 mile NNW of Georgina Point. A detached 4.9m patch lies about 1 mile W and a similar patch lies about 0.8 mile E of Bombay Shoal.

7.37 Reliance Shoal (19°27'N., 93°32'E.), a detached patch with a least depth of 3m, lies about 1.3 miles NE of Georgina Point.

Dalhousie Point, low and sandy, is well-marked by high trees. The ruins of a fort and a large clump of coconut trees lie on the point. A small shoal, with a least depth of 4.9m, lies about 0.5 mile SE of the point.

The N part of Ramree Island, which forms the S side of Kyaukpyu Harbor, is thickly wooded. A sandy beach, with a foreshore of mud which dries up to 0.3 mile offshore, lies on the S side of the harbor between Dalhousie Point and the entrance of Ngalapwe Chaung, about 0.8 miles SE.

Soundings in Ngalapwe Chaung differ from charted depths. In 1964, there was a least depth of 4.8m in the channel leading to the piers within the creek. The least depth was found on the alignment of the entrance range across the bar at the mouth of the creek.

Anchorage can be taken SE of Dalhousie Point, in depths of 16.5 to 18.3m, mud, with the pier bearing between 271° and 288°, 0.5 mile distant. Care should be taken to avoid the shoal and the wreck SE of Dalhousie Point. Strong eddies occur at springs.

Vessels approaching from the W or NW should enter Kyaukpyu Harbor by steering 091° for Kyaukpandu and remain on that course until North Terrible bears more than 212°. When North Terrible bears more than 212°, or when the N extremity of Saddle Island bears 119°, course should be altered to 099° to enter the harbor, steering for Laws Island Light and passing S of Giles Bank and North Shoal and N of Dicey Shoal and Reliance Shoal. Having passed Reliance Shoal, course may be shaped for the anchorage SE of Dalhousie Point.

Vessels approaching from the S may pass E of the Terribles. The approach should be made with the summit of **Nasapo Kyun** (19°39'N., 93°33'E.) in line bearing 029° with the N point of Nakhaungbauk Kyun. When South Terrible bears 316°, course should be altered to 001° to pass about 2 miles W of Irrawaddy Rock. When the summit of Nasapo Kyun bears 040°, and is well open NW of Nakhaungbauk Kyun, it should

be steered for on a course of 040° until Paungnetkyi Light bears 099°. The directions previously given should then be followed for entering the harbor.

7.38 Kyaukpyu (19°25'N., 93°33'E.) ([World Port Index No. 49630](#)), a small town and trading center, lies near the shore about 0.8 mile SE of Dalhousie Point.

An iron pier, about 0.2 mile SSE of Dalhousie Point, has a depth of 3.7m alongside. A submarine pipeline has been laid between a tanker berth and the shore, about 0.8 mile ESE of this pier.

An all-weather jetty, with a 73.2m long pontoon head, safe for coastal vessels to berth alongside at any time, lies on the W bank of the Ngalapwe Chaung, about 1.5 miles above its entrance. A depth of 5.5m exists alongside the pontoon. A T-head wooden pier, in poor condition, is also situated in the creek.

Ramree Island (19°07'N., 93°47'E.) is about 43 miles long in a NW and SE direction and about 20 miles wide across its center, the widest part of the island.

West Point (19°22'N., 93°28'E.), the W extremity of Ramree Island, is located about 2 miles SSW of Adams Point.

The coast between West Point and Thames Point, about 15 miles SSE, has a rocky appearance and rises steeply to a range of high hills. Outer Peak, North Paps, and Tree Summit are the most prominent summits of this range. All of these summits are easily identified when not obscured by the coastal range.

All of the dangers along this section of coast are contained within the 9.1m curve, which nowhere lies more than 1 mile offshore. Research Rock, about 2.8 miles SSW of West Point, has been previously described in [paragraph 7.28](#).

Thames Point to Cape Negrais

7.39 Thames Point (19°09'N., 93°36'E.), a low-lying projection marked by some tall trees, is located on the W coast of Ramree Island, about 12 miles NNW of the entrance of Mun Aung Strait.

The coast S of Ramree Island to Cape Negrais is rocky, irregular, and indented by numerous small bays, none of which provide good shelter during the Southwest Monsoon.

From Andrew Bay to the S, the coastal land is hilly, mountainous, and marked by high peaks which are visible from seaward and serve as useful landmarks. The Arakan Yoma Range rises from the mountainous country along the W edge of Burma. South of Taungnela, the range is lower and terminates in the vicinity of Cape Negrais.

Ramree Harbor, the Saudoway River, and Andrew Bay are of some commercial importance.

Depths—Limitations.—Numerous small islands, rocks, and shoals lie inside the 183m curve SE of Mun Aung Island to a position about 20 miles W of Bluff Cape.

Between Gwa Bay and Cape Negrais, numerous dangers also lie off the coast within the 35m curve. St. John's Rocks and the Northwest Group of the Calventuras Islands lie outside the 35m curve.

Depths within the 18 and 35m curves along the coast between Ramree Island and Cape Negrais are irregular for the most part.

7.40 Nantha Kyun (18°04'N., 94°05'E.), an active mud volcanic island 168m high, lies about 20 miles WNW of Bluff Cape. The island is thickly wooded, but has a bare scar extending from the crater to the water on its W side.

Good anchorage can be taken, in depths of 14.6 to 18.3m, sand and mud, about 1 mile N of the island. The dangers lying E of Nantha Kyun can be avoided by passing within 3 miles E of the island.

Brougham Shoal (18°09'N., 94°07'E.), rocky and dangerous, with a least depth of 1.8m, lies about 4.5 miles NNE of Nantha Kyun. The sea usually breaks over this danger. Detached shoal patches, with depths of 11 to 16.5m, lie up to 2 miles NE of the shoal.

Carpenter Shoals (18°15'N., 94°02'E.) consist of two separate shoal areas, one with a least depth of 4.9m and the other with a least depth of 6.7m. The shallowest patch lies about 10 miles NNW of Nantha Kyun; the deepest patch lies about 3 miles WNW of the shallowest patch. Numerous coral heads and shoal patches, with depths of 12.8 to 18.3m, lie within a radius of 6.5 miles of the E patch.

New Shoal (18°05'N., 94°15'E.), a small rocky patch with a depth of 5.5m, lies about 8.8 miles ENE of Nantha Kyun.

Satellite Ledge (18°07'N., 94°18'E.), a coral shoal with a depth of 25.6m, lies about 12.5 miles ENE of Nantha Kyun.

Vestal Shoal (18°03'N., 94°13'E.), a small coral patch with a least depth of 1.5m, lies about 6.5 miles ESE of Nantha Kyun. Robinson Shoal, about 1.8 miles E of Vestal Shoal, has a least depth of 1.2m coral. Breakers usually mark both of these shoals.

Investigator Ledge (18°01'N., 94°09'E.), a coral patch with a least depth of 21.9m, lies about 3.5 miles SE of Nantha Kyun.

William Shoal, a rocky patch with a least depth of 4.6m, lies about 13 miles ESE of Nantha Kyun. A narrow shoal bank extends about 5 miles WNW from William Shoal and has depths of less than 36.6m.

7.41 Thyne Bank (17°46'N., 94°19'E.), with a least depth of 27.4m, lies about 9.5 miles WNW of **Abhay Island** (17°45'N., 94°29'E.). White Bank, with a least depth of 21.9m, lies about 5.3 miles WSW of the same island. Both banks are of coral formation.

St. John's Rocks (17°28'N., 94°20'E.), a group of four rocks, lie about 20 miles SSW of Abhay Island. The largest rock is 12.2m high and resembles a church when viewed from the N.

The **Calventuras Islands** (16°54'N., 94°16'E.) comprise the Northwest Group, located about 10 miles W of **Broken Point** (16°55'N., 94°23'E.) and the Southeast Group. North Island and South Island lie 7 miles WSW and 8 miles SW, respectively, of Broken Point.

The highest island of the Northwest Group is 38m high. In the Southeast Group, North Island is 39m high and South Island is 24m high. Their well-wooded summits form good landmarks.

Navigable channels lie between the Northwest Group and the Southeast Group, and between the latter group and the mainland. The channel between North Island and South Island should not be attempted. A rock, which dries 2.1m, obstructs the channel midway between the islands and two large rocks lie close N of South Island.

Juanita Shoals (16°00'N., 93°40'E.), a coral bank with a least depth of 29.3m, lies about 30 miles W of Cape Negrais.

The coastal tides between Thames Point and Cape Negrais are semidiurnal.

Tidal currents along the SW side of Mun Aung Island follow the general trend of the coast. Between the SE end of Mun Aung Island and Ye Kyun there is a considerable indraft. During the Northeast Monsoon, the current may set to the S.

The currents in the vicinity of the shoals, lying W of the coast between Andrew Bay and Bluff Cape, are influenced and affected by the monsoons and the tides, both in velocity and direction. The current sets strongly across these shoals.

The current between Gwa Bay and Cape Negrais sets with the direction of the coast, N or S according to the prevailing monsoon, and barely exceeds a velocity of 1 knot.

Rocky Point (19°00'N., 93°41'E.), a low, rocky, reef-fringed projection marked by a white pole beacon, lies on the SE side of Ramree Island, about 10 miles SSE of Thames Point. All of the known dangers along this section of coast lie within 1.5 miles of the shore.

Mun Aung Strait

7.42 Mun Aung Strait (Cheduba) (18°58'N., 93°38'E.) lies between Ramree Island and Mun Aung Island and is entered between Rocky Point and Searle Point, the N extremity of Mun Aung Island. The strait is about 4.5 miles wide, but the navigable channel is much less because of the fringing dangers along the sides. A least charted depth of 6.4m exists along the recommended track leading through the strait.

Beacon Island (18°56'N., 93°27'E.) lies near the outer end of an extensive area of foul ground which extends about 10.5 miles W from Searle Point. This stony 9.1m high island is marked by a white stone beacon on its highest part.

Mud volcanoes frequently raise islets and shoals in the vicinity of Mun Aung Strait. These islets may disappear suddenly, leaving dangerous shoals.

Several volcanic shoals and islets were reported to lie between 4.8 and 8 miles NNW of Beacon Island. The dangers break heavily during the Southwest Monsoon.

Anchorage can be taken, in depths of 9.1 to 11m, good holding ground, about 1.8 miles NE of Beacon Island, with the lighthouse bearing about 215°, or in a depth of 11m with the lighthouse bearing 242°, distant 4.8 miles. Small vessels can anchor, in a depth of 6.4m, mud and sand, about 1.5 miles NNE of Searle Point.

7.43 Northeast side of Mun Aung Strait.—Zikha Taung (18°56'N., 93°51'E.), the highest peak on Ramree Island, rises to a height of 305m about 10 miles ESE of Rocky Point. Dark Hill, 79m high and wooded, lies near the shore about 2.8 miles E of Rocky Point. Helmy Hummock, a small wooded hill about 2.8 mile SSE of Dark Hill, shows up well from the NW. A 123m high dome-shaped hill lies near the coast, about 4 miles NW of the S end of Ramree Island, and is a useful mark for vessels entering the strait from the WNW.

Shoal water, with depths of 5.5m and less, fronts the S coast of Ramree Island at distances up to 1.3 miles between Rocky Point and Button Island, about 9 miles ESE. Between this

island and the S extremity of Ramree Island, about 8.5 miles farther ESE, similar depths extend up to 0.8 mile offshore.

Middle Ground, an extensive shoal area with depths of 4.3 to 5.5m, occupies about 0.7 mile of the channel to the E of the recommended track through the strait between Sandy Point and the S extremity of Ramree Island. Between Middle Ground and the coastal shoal to the W, the channel is about 1 mile wide and has a least depth of 6.4m. The channel between Middle Ground and the S coast of Ramree Island is about 0.3m mile wide with a least depth of 6.1m.

7.44 Southwest side of Mun Aung Strait.—The N coast of Mun Aung Island is generally low and fronted by foul ground; above-water rocks lie on parts of this foul ground.

A patch, with a depth of 5.5m, lies about 3 miles SSW of Rocky Point and is the furthest west of a line of shoals which extends about 5 miles ESE. The shallowest patch has a least depth of 2.4m. The recommended track passes N of these dangers.

A mud volcano shoal, with a least depth of 2.7m, lies about 1.8 miles NE of Sandy Point and close W of the recommended track. Great caution must be exercised when navigating in this vicinity.

The E coast of Mun Aung Island is low for about 8 miles and then becomes high as far S as the southernmost point of the island.

On Chaung enters the sea about 2 miles S of Sandy Point, and is marked by a white pagoda about 1 mile WNW of its entrance.

Mun Aung Village lies about 0.8 mile within the creek entrance.

The coastal bank, as defined by the 5.5m curve, extends from 1 to 6 miles offshore from the E side of Mun Aung Island. Taik Kyun, 78m high with an even-rounded summit, lies near the outer edge of this shoal, about 10 miles SSE of Sandy Point.

Ywathit Taung and Taungni Taung, both on Mun Aung Island, and the high hills on Ramree Island will be visible to vessels approaching Mun Aung Strait from the NW. Helmy Hummock and Dark Hill can be seen over the low ground of Rocky Point.

From a position about 5.5 miles W of Rocky Point with Zikha Taung bearing 102° and Ywathit Taung bearing 170°, vessels should steer 109° on the recommended track indicated on the chart and toward the dome-shaped hill on Ramree Island. When Dark Hill bears 338°, course should be altered to 158°. If Dark Hill is kept bearing not more than 338° astern, the mud volcano shoal NE of Sandy Point will be cleared to starboard. When 2 miles have been made on the 158° course, a bare, blunt, conical hill will appear open W of Dark Hill.

As the edge of the coastal bank E of Mun Aung Island is fairly steep-to in places, preference should be given to the E or Middle Ground side of the channel. When Taik Kyun bears 203°, Middle Ground will have been cleared. From abeam of Taik Kyun, the bare, blunt, conical hill and Dark Hill will be just visible over the horizon and will appear as a hill with twin summits.

7.45 Mun Aung Island (18°47'N., 93°38'E.), roughly triangular in shape, lies about 5.8 miles SW of the SW side of

Ramree Island. The island is well-wooded and marked by several high hills on its W and SW sides.

Ywathit Taung (18°48'N., 93°37'E.), about 7 miles S of Searle Point, is 172m high and conspicuous. Taungni Taung, 196m high, lies about 2 miles farther S and has two pagodas on its summit. Palengu Taung, 257m high, lies 7 miles SE of Taungni Taung on the S part of Mun Aung Island.

The N and E sides of the island have been previously described in [paragraph 7.43](#). West Hill, 185.6m high and wooded, lies 7 miles SE of the NW point of the island.

The high SW coast of Mun Aung Island is bold and fronted by above and below-water rocks.

Henry Rocks (18°52'N., 93°27'E.), a group of above and below-water rocks, lie on a reef about 2.3 miles WSW of the NW point of Mun Aung Island. The highest rock rises to a height of 5.2m.

Oyster Rock, above-water, lies about 1.8 miles SE of Henry Rocks and has been reported to be a good radar target up to 22 miles.

A rock, awash at LW, lies about 1.3 miles offshore W of West Hill.

Pyramid Bay (18°41'N., 93°39'E.), located near the S end of Mun Aung Island, provides good anchorage to native craft during the Northeast Monsoon. A high pyramidal rock lies off the entrance of this bay.

A reef, marked by numerous above-water rocks, extends up to 2 miles S from the S end of Mun Aung Island.

Islands and Approaches to Ramree Harbor

7.46 Ye Kyun (18°37'N., 93°47'E.), Taung Kyun and numerous rocks lie on the foul ground which extends about 8 miles SE from the S extremity of Mun Aung Island.

Ye Kyun lies near the edge of the foul ground about 3 miles S of Taik Kyun. Ye Kyun, reef-fringed, is generally low, but rises to an elevation of 32m in its central part. Several detached reefs lie between the two islands.

Taung Kyun, 4.9m high, lies about 0.8 mile S of Ye Kyun. South Rock, which dries 2.4m, lies near the outer edge of the foul ground, about 0.5 mile S of Taung Kyun.

There is no clear passage between Mun Aung Island and Ye Kyun. Taung Kyun should not be approached within a distance of 2 miles from any direction.

Ramree Harbor (19°01'N., 94°02'E.) lies between the SE side of Ramree Island and the mainland. Ramree Roads and the entrance of the harbor are approached from the NW through Mun Aung Strait and from the SW through Heywood Channel, Childers Channel, and the channel W of Nerbudda Shoal, all of which lie between numerous islands and dangers.

West Shoal (18°30'N., 93°50'E.), a group of sunken rocks, lies about 5 miles SSE of Taung Kyun. The rocks are sometimes visible at LW when the sea breaks over them. Taung Kyun, bearing more than 338°, leads W of this danger.

Sail Rock (18°33'N., 93°51'E.), 2.4m high and small in extent, lies almost 4.8 miles ESE of Taung Kyun. False Rock, 3m high, lies about 4.5 miles NNE of Sail Rock and is joined to it by a chain of sunken rocks and reefs.

Heywood Channel (18°34'N., 93°49'E.) lies between Sail Rock and False Rock, and the shoal ground extending E from Taung Kyun and Ye Kyun. In the narrowest part of this channel

NW of False Rock, there is a least depth of 9.8m. Passage through this channel is not recommended.

7.47 Unguan Island (18°26'N., 93°55'E.), about 11 miles SE of Taung Kyun, is 40m high with a dense clump of trees on its summit. This island lies on the W side of an area of foul ground about 2 miles long and 1.3 miles wide. A detached 7.3m patch was reported to lie about 0.5 mile NW of Unguan Island.

East Reef (18°30'N., 93°56'E.), an area of foul ground which uncovers 1.2m, lies about 4 miles NNE of Unguan Island. Shoal depths of 9.1m and less extend about 0.8 mile NE from the reef.

Cutters Patch (18°28'N., 93°54'E.), a detached 4.6m patch, lies about 2 miles NNW of Unguan Island.

Childers Channel (18°30'N., 93°52'E.) lies between West Shoal, Sail Rock, and False Rock to the W and Unguan Island, Cutters Patch, and East Reef to the E. This channel, which has a least depth of 16.5m, is recommended when West Shoal is breaking.

Nerbudda Shoal (18°22'N., 93°59'E.), irregular in shape with depths of 1.2 to 18.3m, lies centered about 5.3 miles SE of Unguan Island. The channel between Unguan Island and Nerbudda Shoal is almost 3 miles wide at its narrowest part and has a least depth of 18.3m. This channel is frequently used because of the light on Unguan Island. A patch, with a depth of 1.2m which breaks, lies on the SW end of Nerbudda Shoal. This shoal is the remains of a volcanic eruption which occurred in 1908.

Osprey Rocks (18°40'N., 94°05'E.), 2.4m high, lie within the coastal bank about 5.5 miles SE of Magyi Kyun (18°44'N., 94°00'E.), an island on the E side of Ramree Roads.

Gungasager Rocks, 0.9m high, lie at the SW end of a narrow shoal about 4.8 miles SSE of Osprey Rocks. A detached area of foul ground, with depths of 6.7 to 7.9m, lies about 1.5 miles N of Gungasager Rocks.

Pantaw Rocks (18°40'N., 94°09'E.), a group of above and below-water dangers, lie about 4 miles ENE of Osprey Rocks. The N rock lies 0.6m high.

7.48 Ramree Harbor (19°00'N., 94°00'E.) comprises the estuary of the Kaleindaung River, which flows into the sea between the S extremity of Ramree Island and the mainland to the E.

A group of islands obstructs and divides the harbor entrance into two channels, the E and W entrances. The W or main entrance channel is known as The Gates. Ramree Roads lie about 5 miles SW of The Gates.

The tides in Ramree Harbor are semidiurnal.

In the harbor at springs, the flood sets N and the ebb sets S at a velocity of 3 knots. The tidal current sets through The Gates in the direction of the channel at velocities of 3 to 4 knots.

Magyi Kyun (18°44'N., 94°00'E.), the S island in the approach to Ramree Harbor, lies about 6.3 miles SSE of the S extremity of Ramree Island. This 80m high island is surrounded by foul ground. Nyaunghin Kyun, a small islet, lies about 0.5 mile SW of Magyi Kyun and marks the SW edge of the foul ground surrounding the latter island. A small islet lies about in the middle of the foul ground which extends about 1.5 miles W from the W extremity of Magyi Kyun.

Sagu Kyun (18°48'N., 93°58'E.), 106m high near its SW side, is the largest island in the approach to Ramree Harbor and forms the S side of The Gates. Channel Clump, a lone conspicuous group of high trees, lies near the N coast of Sagu Kyun about 1.3 miles WSW of the N point of the island, and forms a useful landmark for The Gates from the SW. Big Rock, 18.3m high, lies on the foul ground close off the S side of Sagu Kyun.

Between the 10m curves in Ramree Roads SSW of The Gates, there is a least charted depth of 9.6m. Depths elsewhere in the approach channel range from 10.1 to 43.9m. Fishing stakes are usually found in the channel about 2 miles S of The Gates.

Channel depths within The Gates are for the most part deep, ranging from 9.6 to 65.9m. Harbor depths up to 10 miles within The Gates range from 10.1 to 20.1m.

Alligator Rocks, which dry, lie near the N shore of Sagu Kyun and are surrounded by deep water. A beacon lies on the shore reef extending about 1.3 miles NE from the NE extremity of Sagu Kyun.

The E entrance of Ramree Harbor lies between the E side of Sagu Kyun and the mainland, but is fouled by numerous reefs and shoals and is available only to fishing vessels and small craft with local knowledge.

7.49 Dragon Shoal (18°53'N., 93°59'E.), parts of which dry, is about 4.3 miles long and narrow and lies with its S end 1 mile NNE of the N extremity of Sagu Kyun. White Rock, 0.9m high and one of a group of above-water rocks on the shoal, lies about 1.3 miles S of the N end of Dragon Shoal.

Two white marks lie on the W shore of the harbor 1.3 and 3.8 miles NNE of the S extremity of Ramree Island. The fairway of the channel between Dragon Shoal and the shore bank to the W is about 0.8 mile wide with depths of 10.5 to 18.3m.

Flat Reef (18°55'N., 94°00'E.), which covers at HW, lies between the N end of Dragon Shoal and the shore bank to the W. The SE and NW sides of the reef are marked by beacons. The reef may be passed on either side, but the channel to the E is preferred.

Low Islet (18°58'N., 94°00'E.), marked by a beacon and steep-to on its E side, lies about 2.3 miles N of Flat Reef and about 0.5 mile SE of Kyangyaung Point, a high bluff.

A rocky patch, almost awash at low water springs, lies about 0.8 mile N of Low Islet. This patch lies about midway between Low Islet and a white mark on the W shore about 1.5 miles NNW of Low Islet.

Oyster Rock (19°00'N., 93°59'E.), which covers at HW and is marked by a beacon, lies 3 miles N of Low Islet.

Cutters Rock lies 1 mile N of Oyster Rock. For about 4 miles N of Cutters Rock to a position abeam of the entrance of the Ramree River, there are depths of 5.9 to 7.3m, but the channel is narrowed by mud banks.

7.50 Middle Bank (19°04'N., 93°59'E.) lies about 1 mile SW of an island located 3 miles E of the Ramree River entrance. This bank partly dries and has a group of rocks awash on its W side.

Nepal Rock, with a least depth of 2.7m, lies about C mile E of the Ramree River entrance. The rock is sometimes marked by a swirl.

Between Nepal Rock and the narrow entrance of the Mingaung Chaung, about 2 miles farther N, depths of 7.3 to 12.8m exist in the fairway.

Fishing stakes are placed at various places in the harbor and may constitute a hazard to navigation.

Excellent anchorage can be taken, in depths up to 18.3m, in all parts of Ramree Harbor, not obstructed by shoals or fishing stakes.

Anchorage can be taken, in a depth of 11m, between the W side of Dragon Shoal and the shore bank to the W, about 3.8 miles NNE of the S end of Ramree Island.

Vessels may approach Ramree Harbor from the S and in such case the channel between Unguan Island and Nerbudda Shoal is recommended. Unguan Island must not be brought to bear less than 350° until well N of Nerbudda Island, when a 046° course may be steered through mid-channel.

Vessels approaching from the SE should pass SW of Gungasager Rocks and Osprey Rocks at distances of 2 and 2.5 miles, respectively. Vessels should pass between 2.5 and 4 miles W of Magyi Kyun and then a N course towards The Gates then steered, taking care to avoid fishing stakes in the near approach to the entrance of the harbor. A course of 054° leads through The Gates in mid-channel.

Then, when the N point of Sagu Kyun bears 140°, course should be altered to the NNE and the W of the two clumps of trees on the N coast of Sagu Kyun kept bearing 208° astern. This leads between Dragon Shoal and the shoals and rocky patches lying off the Ramree Island shore and between Dragon Shoal and Flat Reef. Vessels should be kept to the deeper water towards Flat Reef. Caution is advised. Having passed Flat Reef, course should be shaped to pass about 0.5 mile E of Low Islet and then at similar distances E of Oyster Rock and Cutters Rock, taking care to avoid any fishing stakes.

When N of Cutters Rock, vessels approaching the entrance of the Ramree River should keep about 0.8 mile off the W shore of the harbor. Caution is necessary between White Rock and Flat Reef, and in the vicinity of Oyster Rock, Cutters Rock, and Nepal Rock.

Mingaung Chaung connects the head of Ramree Harbor with the inner part of Kyaukpyu Harbor, via Fletcher Hayes Strait. Vessels drawing 2.4m or less can use this channel.

The Ramree River has its entrance almost 8 miles N of Kyangyaung Point and about 17 miles within The Gates. At ordinary HW, vessels drawing 2.7m or less can enter the river and proceed to within 1.5 miles of the village of Ramree. Local knowledge is necessary.

A road connects the village with a wharf about 5 miles within the river's entrance.

The entrance of the shallow **Kayaing River** (18°45'N., 94°09'E.) lies about 11 miles SE of the N point of Sagu Kyun.

A series of long, low islands forms the coast for about 14 miles SSE of the entrance of the Kayaing River to the entrance of the Sandoway River. The Kyaukpyu mountain range backs this part of the coast. The SW point of Singaung Kyun, the southernmost island along this section of coast, lies on the N side of the entrance of the Sandoway River. A rest house stands on the SW point.

Several detached reefs and rocks, which dry, lie between the entrance of the Kayaing River and Magyi Kyun to the W. The positions of these dangers can best be seen on the chart.

7.51 Whalers Rock (18°37'N., 94°12'E.), awash, lies about 2.5 miles WNW of the N end of Singaung Kyun and 2 miles offshore.

Between Whalers Rock and Drunken Sailor Rock, about 5 miles to the S, the coast is bordered by an area of foul ground which extends up to 2.5 miles offshore in places.

Drunken Sailor Rock (18°33'N., 94°13'E.), which nearly dries and breaks at LW, lies about 2 miles W of the SW point of Singaung Kyun. Under certain conditions of tide and wave height, the rock may be visible at other times.

Zalat Taung, an island 52m high, lies on the S side of the entrance of the Sandoway River, about 0.8 mile SW of the SW point of Singaung Kyun. Foul ground extends about 0.8 mile SW from the central part of the island and a detached 9.1m patch lies about 0.5 mile farther SW.

Singyat Kyun lies close SE of Zalat Taung and is separated from it by a foul channel.

Gaw Taung (18°31'N., 19°16'E.), a 168m high hill, lies near the coast about 3 miles SE of the Sandoway River entrance. This hill is a good landmark, being the highest elevation along this section of coast.

Open anchorage can be taken, in a depth of 11m, mud, about 1.3 miles N of Drunken Sailor Rock, with the rest house on Singaung Kyun bearing 120°, distant 2.3 miles.

During the Northeast Monsoon, vessels with local knowledge can anchor about 0.8 mile S of Drunken Sailor Rock. During the Southwest Monsoon, this anchorage is exposed and dangerous.

A heavy surf breaks on this coast in the vicinity of the Sandoway River entrance when the wind is W of N.

7.52 The Sandoway River (18°33'N., 94°13'E.) is entered between the SW point of Singaung Kyun and Zalat Taung Island. The river is tidal for a short distance above the town of Sandoway. Vessels drawing 2.4m can ascend the river at ordinary HW from its entrance to within 4 miles of the town. Only small craft can be accommodated.

The low, sandy, rock-fringed coast between Gaw Taung and Apaw-ye Kyun, about 9 miles SSE, is backed inland by some isolated hills and ranges.

Apaw-ye Kyun (18°23'N., 94°19'E.), a bluff island, rises to an elevation of 90m. Mud volcanoes were reported to lie about 1.8 miles W and almost 1 mile SSW of this island.

Andrews Bay (18°20'N., 94°20'E.), entered between an unnamed point and Money Point, about 3.3 miles SSW, is clear of dangers in its central part, but bordered by foul ground around its shores and inner reaches.

Money Summit rises to an elevation of 0.8 mile SSW of Money Point. This summit, topped with detached trees, is a conspicuous landmark and easily identified from the offing.

Mills Patch (18°19'N., 94°15'E.), the shoal remains of a mud volcano with a least depth of 6.1m, lies about 4.5 miles W of Money Point and is a hazard to vessels bound for Andrew Bay.

Depths are regular in the near approach to Andrew Bay, decreasing gradually to a depth of 18.3m between the entrance points. Depths within the bay, up to 2 miles within the entrance, range from 18.3 to 9.1m, but much less elsewhere. Depths have been reported to be less than charted in Andrew Bay.

Good anchorage is provided with good holding ground, but the bay is exposed to the full force of the Southwest Monsoon. Shelter is provided from the force of the monsoon in Mayo Bay in the SE part of Andrew Bay, but the swinging room is restricted by a shoal patch in the middle part of the bay.

Sandoway Bay (18°22'N., 94°21'E.), a small shallow indentation, lies on the N shore of Andrew Bay close within the entrance. Two beacons, in line bearing 348°, lead to the anchorage within the bay.

A beacon lies on the E side of the bay about 0.8 mile E of the lighthouse on the N entrance point of Andrew Bay. A radar buoy is moored about 0.5 mile E of the same lighthouse.

7.53 Mayo Bay (18°18'N., 94°22'E.) lies near the SE corner of Andrew Bay and provides sheltered anchorage during the Southwest Monsoon.

Berthing facilities consist of a pontoon jetty and a 112.8m causeway with a depth of 5.2m alongside. Beacons, in line bearing 147°, lead to a position close off the head of this pier.

A large promontory, with Money Point as its NW extremity, extends about 5 miles W from the general line of the coast close S of Andrew Bay. Mawyon Pagoda, conspicuous from seaward when the sun shines on it, stands on the SW part of this promontory.

Dangerous foul ground, marked by numerous above and below-water rocks, fronts the W side of the promontory up to 3.5 miles offshore. A detached drying rocky patch lies about 4.3 miles WSW of Money Point and is the outermost danger. A drying rock lies about 1.3 miles S of the SW extremity of the promontory; a foul patch lies about 1.5 miles SE of the same extremity.

Remarkable Rock (18°14'N., 94°22'E.), 9.1m high and conspicuous, lies about 2.5 miles ESE of the pagoda mentioned above.

The shallow Kamgit River and the Salu River enter the sea about 4.8 miles SE and 6.8 miles SSE of Remarkable Rock.

7.54 Bluff Cape (18°00'N., 94°26'E.), about 14 miles SSE of Remarkable Rock, rises steeply from the sea to a height of 137m and is a fairly conspicuous landmark. The shallow Kyeintali River discharges about 2 miles E of the cape.

Between Bluff Cape and the Gwa River, about 24 miles SSE, the coast is bordered by several hills and peaks which are easily identified from the offing. Taungnela, 1,146m high, lies about 12.5 miles E of Bluff Cape. Kungyaung Taung, 707m high, lies about 14 miles SE of Bluff Cape. High Peak, 12 miles SSE of Bluff Cape, rises to a height of 585m. Taunglun Taung, 253m high, lies almost 4 miles S of High Peak and Button Hill, 124m high, lies 3 miles S of Taunglun Taung.

The Sathwa Chaung (Hswathwa River), almost entirely obstructed by a reef at its entrance, discharges into the sea about 14 miles S of Bluff Cape. A narrow passage leads through the reefs to the village of Hswathwa just within the entrance.

An area of foul ground, marked by numerous drying rocks, extends about 2.5 miles SW from the entrance of the Sathwa Chaung. A 9.1m patch lies about 0.8 mile W of the outer edge of this foul ground.

Gwa Bay (17°37'N., 94°34'E.) is entered between a 63m high peninsula and an unnamed point about 2 miles S.

The N entrance point is fringed by foul ground which extends about 0.5 mile SSW and 0.8 mile W from it. A detached drying reef lies 1.8 miles W of the S entrance point. A similar reef lies 0.5 mile SSW of this reef. **Gwa Kyun** (17°34'N., 94°31'E.), 44m high, lies near the outer edge of the foul ground which extends about 3 miles SW from the S entrance point of Gwa Bay. The island is an excellent landmark.

Anchorage is provided, in depths of 7.3 to 11m, within Gwa Bay, but W winds are experienced.

During the Northeaest Monsoon, vessels occasionally call at the village of Gwa on the E side of the entrance of the river on the S side of the bay.

The coast between Gwa Bay and Broken Point, about 42 miles SSW, is indented by several small bays which provide anchorage in good weather. During the Southwest Monsoon, little shelter is provided except in Danson Bay.

Depths of 4.9 to 5.5m lie within 2 miles S of Gwa Island and up to 1.8 miles offshore. With the exception of the above depths, all of the other dangers lie within 1.3 miles of the shore between Gwa Island and Bomie Bay, about 13.7 miles to the S.

Bomie Bay (17°20'N., 94°33'E.), small in extent and shallow, is available only to small craft.

7.55 Pontamau Island (17°19'N., 94°30'E.), 54m high and reef-fringed, lies about 3 miles W of Bomie Bay. Myauk Island lies near the outer edge of the shoal ground which extends about 0.5 mile NE from Pontamau Island.

Round Hill, 194m high, and Thumb Hill, 238m high, lie 5.3 and 8 miles SSE of Pontamau Island. Both hills are conspicuous and form excellent landmarks.

Danson Bay (17°12'N., 94°29'E.) is entered about 6 miles SSW of Pontamau Island; unlike other bays found along this section of the coast, is sheltered from S and SW winds. Foul ground, marked by numerous rocks, extends about 3.5 miles W from the SW entrance point of Danson Bay. West Sandy Islet, 4.6m high, lies on this foul ground about 0.5 mile from its outer edge.

The central part of the bay has depths ranging from 5.5 to 14.6m, but its shores are bordered by foul ground which extends up to 1 mile offshore in places.

Large vessels can anchor, in depths of 9.1 to 11m, with Round Hill bearing 056° and Thumb Hill bearing 098°. This anchorage is sheltered from all except NW winds. Vessels, when entering, should give West Sandy Islet a berth of 2 miles.

The coast between West Sandy Islet and High Island, about 9.3 miles S, is indented by an open bay in its N part and fringed by shoal ground which extends up to 2 miles offshore in places. High Island rises to a height of 40m. Shoal ground, with depths of 5.5m and less, extends about 3.3 miles NW from High Island. Sandy Island, 10.5m high, lies on this shoal ground about 1.3 miles NW of High Island.

7.56 The Kyaungtha River (16°57'N., 94°26'E.), entered close N of High Island, is shallow and available only to native boats.

Between Broken Point, about 3.3 miles SW of High Island, and Koronge Island, about 24 miles SSW, the coast is rocky and irregular.

The Thitpok River enters the sea about 11 miles S of Broken Point. Round Island, 39.6m high, lies about 0.8 mile N of the

entrance and 0.5 mile offshore. The river is available only to boats.

Vibart Shoal (16°43'N., 94°19'E.), small in extent and irregular, with a least depth of 4.6m, lies about 2.8 miles SW of Round Island.

Alligator Head (16°36'N., 94°19'E.) is the S extremity of a large, rocky promontory about 19 miles S of Broken Point. When viewed from the offing, it resembles an alligator's head facing S.

Ngayot Taung (16°32'N., 94°24'E.), one of the most conspicuous peaks along this coast, rises to a height of 401m, about 6.3 miles SE of Alligator Head.

Milestone Rock (16°40'N., 94°17'E.), a detached steep-to rock 12.2m high, lies 4.5 miles NNW of Alligator Head.

Little Quoin Island (16°39'N., 94°20'E.) lies about 3.5 miles NNE of Alligator Head.

High Island (16°37'N., 94°18'E.) lies about 2 miles NW of Alligator Head, North Reef, South Reef, and West Reef lie about 1 mile S through W to N of High Island. Saba Island lies between South Reef and Alligator Head. Two small shoals, with depths of 8.2 and 16.5m, lie about 2.8 miles WNW of High Island.

Ngayot Bay (16°34'N., 94°18'E.), entered between Alligator Head and the N end of Koronge Island, about 5.3 miles SW, provides little protection except from the S. Large vessels should not enter this bay because of the numerous dangers lying within it. A small shallow river empties into the S part of the bay.

7.57 Koronge Island (Goyangyi Kyun) (16°32'N., 94°15'E.), 81m high and rugged, is wedge-shaped and rocky. North Rock lies close off the NE end and West Rock lies close off the SW end of the island.

Koronge Island has been reported to be a good radar target up to 16 miles.

Goyangyi Kyun Light is shown from a black framed tower with white bands standing on a rising ground near the center of the island.

Good anchorage, protected from the N and NW, can be taken, in a depth of 11m, sand, between the S end of Koronge Island and the mainland. The anchorage should be approached cautiously to avoid Crawford Shoal and the drying rock on the S side of the approach.

Between Koronge Island and Cape Negrais, about 29 miles to the S, the coast is indented by numerous small coastal inlets.

Round Cape, 104m high, thickly wooded, and conspicuous, lies about 15.5 miles S of Koronge Island. Conical Mount, 224m high and cone-shaped, lies about 4 miles SE of Round Cape and is conspicuous from all directions.

Spike Hill (16°22'N., 94°18'E.), about 7.5 miles NE of Round Cape, rises to a height of 259m. Fat Hill, 4 miles NE of Cape Negrais, is 198m high. All of the above peaks comprise the most conspicuous summits between Koronge Island and Cape Negrais.

Crawford Shoal (16°29'N., 94°13'E.), a group of drying rocks, lie about 3 miles SW of Koronge Island. A spit, with a depth of 5.5m at its outer end, extends about 0.5 miles S from Crawford Shoal.

7.58 White Rock (16°29'N., 94°15'E.), which dries, lies about 2.3 miles SSE of Koronge Island.

May Gaumgaun, Ung Chune, and Lichune form a group of islands which lies between 6 and 9 miles S of Koronge Island. Rocks and foul ground fringe the three islands. A narrow shoal, with a least depth of 4.9m, lies centered about 1.3 miles SW of May Gaumgaun. A rock, 3.4m high, lies on the S edge of a shoal area about 0.5 mile SW of Lichune.

A stranded wreck lies close N of Lichune (Leik Kyun).

Saingbain Kieu (16°20'N., 94°11'E.), a group of large conspicuous rocks, some appearing white, parallel the coast for

about 3 miles and 2.5 miles offshore. North Twin, the N rock, lies 6 miles NNW of Round Cape. South Twin, the S rock, lies about 4 miles NW of Round Cape. Several detached shoal patches lie between this group and the coast.

Mushroom Rock, 2.7m high, lies about 2 miles N of Round Cape. Several detached shoal patches, with depths of 9.1m and less, lie within 1.5 miles W through 1.5 miles NW of Round Cape.

Black Rock, 1.2m high and dark-colored, lies about 4.5 miles SW of Round Cape.