



PETROBRAS TRANSPORTE S.A.  
**TRANSPETRO**

# PORT INFORMATION

Terminal  
**COARI**

*1<sup>st</sup> edition*



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# INTRODUCTION

This publication is prepared by Petrobras Transporte S.A. (Transpetro), which operates the Terminal of Coari (TA-Coari).

It presents essential information to the ships that operate at the Terminal and is distributed to interested parts at the port, national and local authorities, and to different departments in the company.

The information contained herein serves to supplement, but never supersede or alter, any legislation, instructions, guidance or official publications, either national or international. Thus, anything that conflicts with any of the aforementioned documents should be ignored.

The Terminal reserves itself the right to change any information herein presented, with no advance notice.

Transpetro will analyze any suggestion, recommendation or correction related to the topics addressed herein, in order to improve the information. Where any information is found to be incorrect and requiring updating, please contact:

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## DEFINITIONS

**Giaont** – Safety Surveyor Staff

**IMO** – International Maritime Organization.

**Isgott** – International Safety Guide for Oil Tankers and Terminals.

**Proa** – Praticagem dos Rios Ocidentais da Amazônia Ltda.

**Unipilot** – União dos Práticos da Bacia Amazônica Oriental Ltda.

**UTC** – Universal time control – Standard universal time.

**VTS** – Vessel Traffic Service – Traffic Service to the Ship.





## CHARTS AND REFERENCE DOCUMENTS

Information concerning navigation to the Terminal can be obtained from the publications listed below.

### 3.1 Nautical Charts

Area	Chart Number/Brazil (DHN)
From Manaus to Marrecão Island	4107 A
From Marrecão Island to Gabriel Island	4107 B
From Gabriel Island to Cipotuba Island	4108 A
From Cipotuba Island to Padre Island	4108 B
Vicinities of the Coari Port	4108 B
Coari Port	4108 B
Port in the Terminal of Coari (TA-Coari)	4108 B

### 3.2 Other Publications – Brazil (DHN)

Type/Subject	Publication Number/Brazil (DHN)
Normas e Procedimentos da Capitania dos Portos	NPCP
Nautical Route of the Northern Region	–
Atlas of the Solimões River Hydrography from Manaus to Tabatinga	4150



## DOCUMENTS AND INFORMATION EXCHANGE

The items listed below must be provided by the Terminal or ship, as indicated on the table.

Information	Prepared by:			Delivered to			Comments
	Terminal	Ship	Both	Terminal	Ship	Both	
Before Arrival							
Confirmation of ETA		X		X			According to Annex A1
Request for support from port	X				X		According to Annex A2
Before Cargo or Bunker Transfer							
Details about on-board cargo/slop/ballast		X		X			According to initial chart
Essential operating information.	X				X		According to initial chart
Ship/Shore Safety Checklist			X			X	According to Annex II Part “A” – Mutual Procedure for Operating Ships and Terminals from Transpetro

*continue*

Information	Prepared by:			Delivered to			Comments
	Terminal	Ship	Both	Terminal	Ship	Both	
During Cargo Transfer							
Repeat the Safety Checklist			X			X	According to Annex II, Part “A” – Mutual Procedure for Operating Ships and Terminals from Transpetro
After Cargo or Bunker Transfer, before Departure							
Information required for unberthing the ship			X			X	Quantity of fuel and water on-board
After Unberthing, on Leaving Port							
Information concerning departure from port		X		X			Pilot departure time and ETA Manaus

## DESCRIPTION OF THE PORT AND ANCHORAGE AREA

### 5.1 General Description of the Terminal

The Terminal of Coari is located in the Amazon region, on the right bank of the Solimões River, 16 km upstream from the city of Coari and 2 km downstream from the community of Vila Lira. Its purpose is to drain off the oil and LPG from the Urucu producer region, received and stored in the tanks and spheres at the Terminal. It is interconnected to the Arara Complex, in the Urucu producer region, by an oil pipeline with a 14" rated diameter and 281 km in length, which carries oil and C5+, and a gas pipeline with an 18" rated diameter and 281 km in length, which carries LPG. It borders to the east with Paraná do Padre and to north with the city of Coari.

The Terminal has two main floating river piers, one for ships and ferryboats that carry oil, and other for ships and ferryboats that carry LPG. Both use loading arms and one floating pier designated for dry cargo, embarking/disembarking passengers and a berth for support boats.

The upstream berth, near the oil pier, is formed by the Floating Operation Platform (POF-1) and mooring buoys. The Floating Operation Platform is interconnected to a Floating Supporting Platform (PAF), which is connected to shore by an articulated bridge, named truss, which touches the ground on the PAF and is accessed using a ladder.



The downstream berth, near the LPG pier, is formed by the Floating Operation Platform (POF-2) and mooring buoys, has the same configuration as the upstream berth and lies 360 meters from the oil pier.

## 5.2 Location

### 5.2.1 Coordinates

- Latitude: 03° 56' 20" S
- Longitude: 063° 10' 00" W

CHARTS, NAUTICAL PUBLICATIONS AND INFORMATION TO NAVIGATORS AMAZON RIVER, 4108 B  
– From Cipotuba Island to Padre Island.

### 5.2.2 General geographical location

The Terminal is located on the right bank of the Solimões River, 16 km upstream from the city of Coari, in the municipality of Coari, Amazonas, Brazil.

## 5.3 Approaching the Terminal

### 5.3.1 General description

The Terminal is approached through a river section, enabling the navigation of oil tankers with up to 30,000 DWT and maximum draft of 8.50 meters (total cargo) in the

flood season, reducing to 7.00 meters (cargo reduced due to draft) in the dry season.

The ships may seek the Terminal facilities only during daylight, depending exclusively on the availability of berth and favorable weather conditions.

When the ship passes the city of Coari and heads to the final approach of TA-Coari, or 1 hour before arrival, the NOR may be issued and the ETA may be confirmed using maritime VHF with the Terminal's Control Room. The call will be made via channel 16; then, it must pass to another conversation channel.

When the ship is across the red barriers, on the bank opposite the community of Esperança, the support service from the port must be requested. Such service will be carried out by the boats that will help with mooring, and the ship starts navigating at slow speed.

The approach to the Terminal will be executed with actual speed not exceeding 3.5 knots. The starboard anchor must be readied.

When the ship's bridge is near the POF truss breast line, and the distance is approximately 0.5 to 0.8 mile from the Terminal, measured using radar, the starboard anchor must be dropped.

With the help of the current, engine commands, helm commands and the addition of mooring lines, the approach process to effectively berth the ship by the port side begins.

### 5.3.2 Anchorage area

The anchorage area is demarcated by the following geographic points, downstream from the Coari Lake mouth:

#### Beacon Signaling for the Anchorage Point in TA-Coari

Point	Latitude	Longitude	Note
A	04° 04' 00" S	063° 08' 02" W	According to information from Praticagem dos Rios Ocidentais da Amazônia Ltda., this position does not na segurança da navegação
B	04° 03' 02" S	063° 08' 70" W	
C	04° 03' 01" S	063° 08' 06" W	
D	04° 03' 08" S	063° 07' 08" W	

Further information can be obtained from the Service of Praticagem dos Rios Ocidentais da Amazônia.

***Anchorage area where pilot embarks***

- **In Itacoatiara** – In front of the city of Itacoatiara.
- **In Manaus** – The first one is located near the TA-Manaus, on the opposite bank, near the Xiborena coast; the second one is located upstream from the Bom Jardim rocks, between longitudes 059° 59' 00" W and 060° 00' 00" W.

***Forbidden anchorage areas***

In the port region of Coari, it is forbidden to anchor ships out of the zone demarcated as anchorage area, which would put navigation safety at risk.

**5.3.3 Help with navigating the access channel**

The Terminal is accessed by natural channel, under the supervision of the Board of Hydrography and Navigation of the Brazilian Navy. When the ship is at an oblique angle the city of Coari is the engines seen to, when the ship is at an angle to the steep, red gullies on the left bank and the community of Esperança I on the right bank of the Solimões River, the ship must start navigating at slow speed.

It is mandatory for the ships navigating to the TA-Coari to use a pilot. The pilots embark at Itacoatiara or at Manaus.

**5.3.4 Port control or VTS (Vessel Traffic Service)**

The city of Coari port and the port of the Terminal of Coari have no special traffic and navigation control services. The maritime traffic in the Solimões River is managed by Manaus Harbor Master.

Additional information, rules and notices in force can be obtained directly from the Manaus Harbor Master website: <http://www.cfaoc.mar.mil.br>.

**5.3.5 Pilotage**

Pilotage in the Amazon River is mandatory beginning at Santana, when sailing upstream, whenever the ship enters by the north channel.

Another pilotage association of the upper Amazon – named Proa – covers navigation from Itacoatiara to the frontier with Peru. These pilots guide the navigation of ships heading to the Terminal of Coari. There are three places where pilots can embark in Manaus: the confluence of the waters, TA-Manaus anchorage area and TA-Manaus pier.

After they are berthed, the ships must remain in conditions deemed satisfactory by the pilot and Terminal operators.



### 5.3.6 Support vessels and port services

The Terminal has a mooring service that includes the provision of two vessels with diesel engines which support maneuvering the ropes during the mooring/casting off work.

The vessels will be made available to the pilots in time enough for the maneuver.

Boats for transporting people – The Terminal does not have boats specifically for transporting people. The crew, when authorized to use the Terminal facilities, will disembark by the aluminum ladder providing Terminal/ship access. When it is necessary to use ladders alongside the ship so that personnel can have access, this service will be carried out by the boats Poraquê I and Poraquê II or a replacement boat.

The pilotage service schedule, including for freight ships headed to the TA-Coari, is drawn up by the Petrobras agency in Manaus, known as SC RNNE/Agência Marítima Manaus, which operates in Reman, room 125 (business hours: contact phones (55 92) 616-4358, 616-4105, 616-4148 and 616-4300; 24-hour service, and contact via cellular phones (55 92) 9981-0198 and 9602-4501).

The Open Amazon Pilotage Services (Serviços de Praticagem do Alto Amazonas) are available 24 hours a day. The request for pilot must be made by SC RNNE/Agência Marítima Manaus to Proa (Rua Boulevard Sá Peixoto, 275 – Educandos – Manaus – AM – 69070-160; phones (55 92) 624-2164 and 629-6208; fax (55 92) 624-3649).

Embarking/disembarking materials – The Terminal uses the support vessels to deliver and receive materials to/from the ships berthed, with authorization from the ship.

#### *Communication between support vessels and ships*

The support vessels are equipped with VHF for continuous communication between them and the ship during the berthing and unberthing maneuvers. In case radio communications between the support vessels and the ship fails, standard whistle signals must be used.

### 5.3.7 Risks to navigation

#### *References and signals*

- **From the Negro River confluence to the TA – Coari** – See charts 4106, 4107 and 4108.
- **Ponta de Catalão** – Catalão Lighthouse (03° 08' 6" S – 059° 55' 01" W) – Displaying 1-second white flashes at the location called Meeting of the Waters.
- **Codajás** – Water tower on the left bank of the Solimões River, east of the Coro Island, near the pluviometric station, at longitude 062° 03' 00" W.

→ **Itapena** – Pluviometric station on the Coari Lake shore, on the right bank of the Solimões River, 7 miles downstream from the city of Coari.

→ **Coari** – Village with church and noticeable water tower, located at the entrance to Coari Lake, on the right bank of Solimões River, at longitude 063° 09' 00" W.

***Submerged ridges, banks, rocks and others in the Solimões River and access channel***

The Solimões River is navigable throughout the year, and there are navigation restrictions only during the dry period, which usually occurs from August to December. During this period, navigation is limited to small vessels. During the dry period, navigators may find stretches with restricted visibility due to land being cleared by burning. Throughout the year one can find stretches with reduced visibility due to heavy rains and mists that usually occur in the morning.

The river bed changes frequently, with changes in the navigable channels from one year to another, due to banks being displaced.

Due to the frequent changes in the navigable channels, anchoring may occur in the Manaus and Coari section, so that transit occurs safely in daylight.

***Section between Manaus and Coari***

→ **Moura Island Passage** – The channel is limited to large size ships when passing the two ends of the island, due to the shallow depth in the dry season.

→ **Caldeirão Coast Passage** – There is a rock on the left bank, upstream from the city of Iranduba. It is visible in the dry season.

→ **Calado Coast Passage** – Limited by depth in the dry season for large size ships.

→ **Manacapuru Beacon** – Passage limited due to a rock near the beacon and a sandbank in front of the city. In the dry season, large size ships navigate by the left river bank, between the bank and the city. Special care must be taken with the rock downstream from the channel. There are waves (stirred up by the passage of the poporoca) in this location.

→ **Arraia Bank Passage** – The sandbank shifts frequently, and good knowledge of the location is required for large ships to navigate safely. During the dry season, the restriction on navigation applies to all types of boats.

→ **Ajaratuba Coastal Passage** – Near the community of Porto Estrela, passage is limited due to shallow depth in the dry season.

- **Ambé Coastal Passage, between the Purus River mouth and the city of Anori** – In the dry season, it harbors submerged ridges of the stone-like block type, isolated and in several locations, limiting the passage of large ships.
- **Jamacanã Passage** – During the dry season, the narrowing of the channel and the reduction in depth limit the passage of large ships.
- **Passage in the stretch between the Badajós River mouth and the upper end of the Botija Island** – At this point and as far as the city of Coari, navigation in the Solimões River is most limited. The banks change constantly, becoming very shallow and restricting the passage of large ships in the dry season. The channel changes from year to another, and knowledge of the region is required to navigate safely.

Along this stretch, since the navigable channels are very narrow and shallow, the pilot must make all visual resources available. Therefore, it is mandatory that the stretch must be navigated during daylight.

### 5.3.8 General restrictions

- **Time restrictions** – TA-Coari (formerly Tesol) – It is mandatory that maneuvers in this stretch be carried out during the day with the support of boats suitable for maneuvering and lifting the towropes and equipped with VHF equipment.
- **Winds and currents** – Restrict berthing, unberthing or on-going operations (when berthed): winds > 25 knots and currents > 5 knots.
- **Maximum draft recommended (MDR)** – In the flood season, 8.50 meters; in the dry season, 7.00 meters.
- **Berthing speed and angle** – These are limited by the fender absorption capacity and the pier structure. The approach speed is of 0.10 m/s for ships of 30,000 DWT, 25,000 DWT and 18,000 DWT that operate at the oil pier, and of 0.15 m/s for ships with 8,900 DWT that operate at the LPG pier.

### 5.3.9 Evolution basin beacon signaling

It is the captain's responsibility to require the pilot to maneuver the ship within the limits of evolution basin. TA-Coari does not have a demarcated location for evolution basin yet. Generally speaking, the maneuver is carried out when the ship is unberthing and leaving or when the berthing maneuver goes awry. The maneuver happens upstream of the piers, at a minimum distance of 111 meters from the POF bow in the northwesterly direction, when the moors are collected, the ship has raised anchor and without the use of tugs, at a location with a suitable area and depth.

### 5.3.10 Depth control

At the TA-Coari, the draft limit for berthing and unberthing in the berths does not change throughout the year. The points that limit the maximum draft for navigating in the stretch from Manaus to Coari are described in the nautical charts as a function of the flood and falling periods of Solimões River.

### 5.3.11 Maximum dimensions

The maximum size of ships berthing at the TA-Coari is 30,000 DWT for berthing at the POF-1 and 30,000 DWT for berthing at the POF-2.

## 5.4 Environmental Factors

### 5.4.1 Winds

The predominant winds are from the NE, with a speed of 19 m/s. To establish the dimensions of the berthing structures: wind of 30 m/s and current of 4 knots were taken into account.

### 5.4.2 Waves

There are no records of waves capable of affecting the berthing, unberthing and operation maneuvers of ships.

### 5.4.3 Rains

The rainfall in the region where the terminal is located is of 2,225 mm/year.

The flood season on the Solimões River is the rainy season in the region, which goes from November to June, with the maximum level in June and July. The falling period goes from July to October, with minimum level in October and November.

### 5.4.4 Visibility

Throughout the year, there may be stretches with reduced visibility, due to strong rains and mists that usually occur in the morning.

In the dry season, navigators may encounter stretches with restricted visibility due to the clearing of land by burning.

### 5.4.5 Currents

In the access channel to the Terminal, the river current reaches the speed of 2 to 4 knots. The east winds prevail and influence maneuvering, especially for unloaded ships.

In the rainy season, the falling current of the river may exceed the values mentioned.

#### 5.4.6 Rise and fall of water levels

In relation to the reduction level adopted – which is the average level of the exceptional minimum values – the variations in the river levels due to floods and other factors occur as explained below:

→ Maximum water level: + 14.66 meters

→ Minimum water level: – 1.39 meter

**Note:** The reference level adopted as a result of a Portobras survey, is the zero level in Itapeuá, which corresponds to the reading of 7.05 meters on the measuring rod at the TA-Coari.

#### 5.4.7 Air humidity

The relative air humidity is high, ranging from 82 to 88%. The average relative air humidity is of 85% throughout the year.

#### 5.4.8 Temperatures

From November to June, the temperatures range from 22° C (71.6° F) to 28° C (86.0° F). From July to October, the temperatures range from 27° C (80.6° F) to 34° C (93.2° F).



## DESCRIPTION OF THE TERMINAL

### 6.1 General Description

The Terminal is 16 km away from the Coari Port and 281 km away from the producer region. It is responsible for draining the production of the Arara Complex, whose by-products contribute to supplying the Northern and Northeastern regions of Brazil. It has storage unit installed with a capacity of 78,000 cubic meters, distributed in three tanks with 20,000 cubic meters for oil and six spheres of 3,000 cubic meters for LPG.

Receiving an average of 20 ships and 20 ferryboats per month, its loading operations handle a volume of 270,000 cubic meters of oil and LPG. The TA-Coari has two berths, one for loading oil, the other for LPG.

The TA-Coari handles all the LPG produced at the Arara Complex, which when loaded onto ships and ferryboats, supplies the Northern region, the State of Maranhão and part of the State of Ceará. The entire oil produced in the Arara Complex also passes through the TA-Coari and, after being loaded onto ships and ferryboats, is transported to the Manaus Refinery. After being transformed into by-products, such as diesel, gasoline and LPG, it is destined for the Reman tanks and spheres. Afterwards, it is sent to the distribution companies, which serve Manaus and other cities in the State of Amazonas as well as other States in the Northern region.

The Terminal also operates a 14" oil duct, 281 km in length, which carries oil and C5+, and an 18" gas duct, 281 km in length, which carries LPG. Both ducts interconnect the Terminal to the Urucu producer region.

## 6.2 Physical Details of the Berths

The table below presents the characteristics of the Terminal's mooring berths.

Pier	Distance between entre Fenders (m)	Berth Depth in Flood/Fallin (m)	Maximum Ship Length for Berthing (m)	DWT Max. (tonnes)	Products
POF-1	17,5 / 20,1	30.0 / 18,0	185	30,000	Oil
POF-2	17,5 / 20,1	28.0 / 16,0	185	30,000	LPG

## 6.3 Berthing and Mooring Arrangements

### 6.3.1 Table of berthing and unberthing at the TA-Coari

Pier	Period	DWT Ship	Maximum Length (m)	River Conditions	Board	Maximum Draft (m/feet)
POF-1	Daytime	up to 30,000	185.0	Full	Port side	8.50 / 27
	Daytime	up to 18,000	135.0	Dry	Port side	7.00 / 23
POF-2	Daytime	up to 30,000	185.0	Full	Port side	6.90 / 23
	Daytime	up to 9,500	1.355.0	Dry	Port side	6.90 / 23

### 6.3.2 Movement of boats in the channel and restrictions on speed, crossing and overtaking

The shape of the navigable channels, the depth and type of banks affect the behavior of vessels. Thus, controlling the speed during navigation becomes an important factor for preventing accidents.

The movement of ship in shallow waters (dry season) causes pressure variations in the liquid mass, which may topple the ship and seriously affect its control. Therefore, the safety of navigation in shallow waters depends on the speed in relation to the river bottom.

Considering the possible damages caused to the banks, the boats berthed and the facilities located thereon, the passage of boats at a speed exceeding 10 knots is not forbidden, (Proofreader's Note: should this not read as "is forbidden"?) at a distance of less than 150 meters from the banks and locations where the boats concentrate and from the floating oil and LPG piers.



### 6.3.3 Recommended mooring

The mooring of all ships headed to the TA-Coari requires the ship's anchor to be thrown to starboard, as well as a line to the stern buoy, at both piers.

The ship must berth on the port side to carry out the mooring below. The mooring of spring lines and breast lines is carried out at the bollards of the Floating Operation Port, and the mooring of the bow and stern lines is carried out directly on the two buoys supported with stays in the ground for this type of mooring.

The ships berth without the help of tug in the TA-Coari. Berthing is guided by pilots of the company Proa Ltda.

The mooring service is carried out by the company contracted, using of two support vessels.

The safety of the mooring is the responsibility of the ship's captain and will be evaluated by a qualified safety inspector. The TA-Coari may veto or interrupt an operation where the mooring of the ship is considered unsatisfactory. The minimum configuration for mooring is presented below.

Pier	Lines		Breast line		Spring lines	
	Bow	Stern	Bow	Stern	Bow	Stern
PP-1*	2	2	2	2	2	2
PP-2*	2	2	2	2	2	2

\* The mooring must be reinforced when the river current reaches 5 knots due to the flood (use three lines on the bow).

### 6.3.4 Positioning the bollards, number of ropes and maximum loads

Pier	Bollards	Number of Ropes	Maximum Loads (kgf)
POF-1	4 bollards 2AV/2AR	6	50,239
POF-2	4 bollards 2AV/2AR	6	50,239

## 6.4 Characteristics of Berth for Loading

The tables below indicate the products moved, arms available, flange details, temperature limits, maximum flow rates and pressures for loading.

These values are merely for information purposes and are based on historical maximum values. It is necessary to define the operational conditions – arms, board

manifolds, number of lines, number of pumps, pressure, flow rate and temperature – during the initial ship release.

Pier	Arm TAG	Arm Flanges		Product	Temperature [°C]		Max. Flow [m³/h]	Max. Pressure [kgf/cm²]
		Diameter	Class (pound/in²)		Min.	Max.		
POF-1	BC-8001	12"	150	Petróleo	Amb	Amb	2.000	10
POF-2	BC-8002	8"	300	GLP	Amb	Amb	650	15

## 6.5 Berthing Management and Control

The maneuvers for berthing and unberthing ships in the Terminal of Coari must always be carried out with the participation of two qualified pilots, without the use of tugs.

The ship pivoting maneuvers, whenever necessary, must occur upstream from the piers, with a minimum distance of 111 meters from the POF bow in a northwesterly direction, and pivoting in front of the piers is forbidden.

All maneuvers are followed and recorded by the Control Room with mobile closed television circuit cameras.

During berthing, an operational Safety Inspector (Giaont) and an operator remain on the pier, in a position to evaluate the maneuver and direct the positioning of the ship in relation to the loading arms. A mooring team is available to place the mooring lines on the bollards and slip hooks.

An operator and an operations assistant remain on each pier and are responsible for operational tracking and exchange of information with the ship, communication, drawing up documentation and monitoring the berthing, as well as for the ship position. The operator and the operations assistant have a VHF radio for simultaneous communication with the ship and the control room.

## 6.6 Main Risks to Berthing and Laytime

The weather conditions in the access channel, the evolution area and the berthing piers are usually quite favorable and safe for navigation, maneuver and laytime.

The main risks associated with ship maneuvers and laytime in the TA-Coari berths are:

- when berthed at the POF-1, due to the strong currents during the fallings, the bow of the ships berthed may open. In currents over 4 knots, it is recommended reinforcing/ increasing the number of bowline ropes to at least three ropes;

→ when berthing at POF-1 and POF-2, due to the strong wind currents, berthing may occur at speeds above the operational limit for the chain ropes of the pier, causing damages to the Terminal facilities and those of the ship.

Such risks require greater attention from the ship's crew and pilots where the mooring works and ropes are concerned.



# PROCEDURES

During the ship's laytime at the port, various actions are take to make the operation safe and to manage the risks in such a way as to reduce them to a minimum. At every stage, as described in the sub-items below, measures are taken to facilitate the operations and to plan them properly.

## 7.1 Before Arrival

The ship must be aware that when it berths, and after the operational Safety Inspector (Giaont) has carried out his safety inspection based on the Isgott Safety Checklist, if there are pending issues not solved by the crew, the ship will not be authorized by the Terminal to start the operation.

On-board repairs and washing the ship's cargo tank must be preferably carried out in the anchorage area. To carry out these services with the ship berthed, prior authorization from the Terminal will be required.

Ships heading to the TA-Coari facilities must indicate their estimated time of arrival (ETA) 72, 48 and 24 hours in advance, directly to the respective agent, via telex, telephone or fax. Changes to or confirmation of the ship's arrival must be communicated at least 24 hours in advance. The ETA information must specify whether the time informed is local or UTC.

## 7.2 Arrival

The port authorities are called into play by the ship agents when the ships pass Manaus. The visit usually occurs when the ships are coming to the TA-Coari.

The Terminal does not bunker nor replenish water.

The communication with the terminal is via maritime VHF, on call channel 16. The usual conversation channels are 6, 8, 9, 10 and 14. The Terminal operates on the channels 6 and 9.

The NOR can be issued when the ship is passing the city of Coari and heading to its final approach to the TA-Coari, or 1 hour before arrival.

If the ship arrives in port before the first day of the period scheduled, the permitted lay-time will start when the first mooring line is fastened or at zero hour and one minute of the first day of the aforementioned period, whichever occurs first.

If the ship arrives in port after the period scheduled, the permitted laytime will start when the first mooring line lug has been fastened.

The laytime ends when the ship drops the last mooring line.

The Terminal has four pumps to transfer oil and two pumps to transfer LPG. To transfer the Urucu oil, three pumps with 700 m<sup>3</sup>/h of flow rate are used, and one pump is for backup. To transfer LPG, one pump with 600 m<sup>3</sup>/h of flow rate is used, and one pump is for backup.

Information from the Terminal to the ship and vice-versa is described in the loading/receiving procedure, which is formalized on the initial release of the ship to comply with the regulations from N-2689.

### ***Contact telephones in Manaus***

#### **Manaus Harbor Master**

(55 92) 3241-1373, 3320-3777, 3320-3811

#### **Serviços de Praticagem dos Rios Ocidentais da Amazônia Ltda.**

(55 92) 3624-2164, 629-6208

Fax: (55 92) 3624-3649

#### **Federal Police – Maritime, Air and Frontier Police Division**

(55 92) 3655-1580

#### **Port Healthcare Service – Sanitary Inspection**

(55 92) 3232-4990

**Delegacia da Receita Federal (IRS Department)**  
– State Department of Ports, Rivers and Channels  
(55 92) 3635-1106

**Brasil Salvatage**  
(55 92) 3645-5032, 9982-9843

**Brigadeiro Eduardo Gomes International Airport**  
(55 92) 3652-1210, 3652-1212

**Ipaam – The Environmental Protection Institute of the State of Amazonas**  
(55 92) 3643-2300, 3643-2315, 3643-2325

**Ibama – Instituto Brasileiro de Meio Ambiente e Recursos Naturais Renováveis**  
(Brazilian Institute for the Environment and Renewable Natural Resources)  
(55 92) 3613-3277, 3613-3095, 0800-618080

**Military Police, Civil Police, Fire Department and Civil Defense**  
190, 147, 193, 199

**The 28 de Agosto Hospital**  
(55 92) 3643-4800

**The Adventista Hospital in Manaus**  
(55 92) 2123-1313

**Hospital e Clínica São Lucas**  
(55 92) 3622-3678

**The Santa Júlia Hospital**  
(55 92) 2121-9000, 2121-9090

**Prontocord Hospital do Coração (Heart Care Hospital)**  
(55 92) 3621-7500, 3251-7507

***Contact telephones in Coari***

**City Secretariat of the Environment and Mineral Reserves**  
(5597) 3561-2969

**Civil Defense in Coari**  
195

**Hospital Regional Prefeito Dr. Odair Carlos Geraldo**  
(5597) 3561-3077

**Centro de Defesa Ambiental (Environmental Defense Center) – CDA (Coari)**  
(55 92) 8121-5886, (5597) 9612-8870

## 7.3 Berthing

### 7.3.1 Ship mooring

The ship mooring system must meet the requirements of item 6.3.

The mooring lines must be looked after constantly so that the ship always remains berthed. All the lines must be kept under adequate tension during the operation, and winches with their brakes on. Using automatic tensioning winches is not permitted.

All the mooring lines must be of same type, gauge and material (fiber or wire); mixed mooring lines are not permitted.

Mixed mooring lines are those in which the lines performing the same function are of different type, gauge and materials.

The mooring lines must be arranged as symmetrically as possible in relation to the middle of the ship.

The breast lines shall be oriented as perpendicularly as possible with the longitudinal axis of the ship, and passed as much as possible forward and aft.

Spring lines must be oriented as parallel as possible to the longitudinal axis of the ship.

When tails are used on the wire lines, the tails must be of the same type, with a gauge 25% greater than the minimum breaking load of the wire, and be of the same material and length.

The horizontal angle of bow and stern lines relative to a breast line perpendicular to the ship's longitudinal axis should not exceed 45°.

### 7.3.2 Ship/Terminal access

Access to the TA-Coari piers is via aluminum wharf ladders with handrails, which are placed by the ship with support from the Terminal personnel.

All ships must have secure access means for personnel embarking and disembarking, and must always keep their wharf ladders and ladders ready for lowering. Where wharf ladders are used, there must be a free walking space, and such wharf ladder must have a protective net. Lifesaving buoys with a guide rope must be available near the means of access. The gangway ladder or wharf ladder on the ship must be used when necessary.

The crew that uses the Terminal facilities when disembarking must wear leather shoes, long pants and sleeved shirts, and only circulate within the previously authorized area. The list of crewmembers who will disembark using the Terminal facilities and services must be forwarded to the Terminal at the time of the ship's initial release.

Circulation by the crew at the Terminal facilities without prior authorization is forbidden, except on the ship/ Floating Operation Port of the Terminal section.



## 7.4 Before Transferring the Cargo

**Electrical grounding** – The loading arms are individually electrically grounded. The ship may be electrical grounded using a ground cable, connected to the Terminal structure.

**Connections and reductions** – The resources necessary for connection are agreed upon during the first contact between the ship and the Terminal. The ship must prepare the manifolds and install load reductions and connections in order to enable the loading arm to be coupled. The shore personnel connect and disconnect the arms and hoses, assisted by the on-board personnel, who handle the winches and derrick, when necessary. After the loading arms are connected, they are tested for tightness, using the static pressure on the Terminal column for oil and the ship pressure for LPG. One on-board representative must accompany the entire operation, and must be close to the ship's loading manifold. It is mandatory for all connected arms to be supported on a bracket, specially those linked to reductions.

**Safety inspection** – The operation only begins after the initial chart is filled in by the on-shore and on-board representatives. The Ship/Shore Safety Checklist. (Annex A of Isgott) is checked and filled out by Safety Inspector (Giaont) during the initial release of the ship.

**Communication methods** – The communications with the ships are via VHF radios in previously registered and agreed maritime frequencies. A secondary means, using land-based VHF radio, is agreed upon in case the main system fails.

**Operational control** – The TA-Coari has a control room. The "Operation Control Room" is located near the administrative building and is responsible for all operations carried out on the piers. The operators who are responsible for controlling all Terminal operations using the supervisory system, work in this room.

**Tank inspection** – Whenever possible, a ship should be inspected without entering the tanks. If the cargo requires that the internal tank be inspected, all safety precautions inherent to entering confined spaces must be taken. In this case, the ship must arrive with its tanks degassed and in the "free for man" condition. If the TA-Coari or the inspector reject the tanks inspected, the delay will be debited to the ship.

**Inspecting the quantities** – The measurements aboard will be carried out by the ship's personnel and inspected by the Terminal representatives or other inspectors. The material used must be duly grounded, and the measurement instruments must be explosion-proof.

**Ballast Jettisoning** – The Terminal does not have tanks for receiving discharged slop.

**Cleaning** – Boiler tubes should not be cleaned while the ship berthed. Every precaution must be taken so that sparks do not escape from the smokestack. The non-compliance with this regulation will cause one or more of the sanctions below: immediate interruption of operations; a fine from the relevant authorities; compulsory ship unberthing from the pier; notification on the infraction to the ship owners; the ship being held

responsible for the fines, demurrage and all other related expenses resulting from this fact.

**Small boat access** – The prohibition concerning unauthorized small boats remaining at the hull side or near the berthed ships must be strictly observed. Only the Terminal service vessels or authorized vessels may remain in the vicinity or side by side, provided that they meet all safety conditions. The violation of this rule shall be communicated to the competent authority.

**Protection against product return and overflow** – The Terminal does not have retaining valves to prevent the product from exiting to the ship when the shore manifold is aligned. When discharging, it is up to the ship to monitor possible undesirable items received and the tank levels, in order to avoid overflows.

**Propeller maintenance** – The ships berthed may not turn their propeller(s) while they are connected to the loading arms. The jacking gear may be used, once the Terminal operator has been duly notified, however, the propeller must be turned slowly in order to ensure absolute safety. Ships will be held responsible for any damages resulting from these procedures.

## 7.5 Cargo Transfer

**Pressure monitoring** – During cargo transfer, monitoring at the ship's manifold is registered by the representatives aboard and ashore on an hourly basis. The Terminal controls the internal pressure variables, and the flow rates are checked in real time via the supervisory system available in the control room and pressure gauges installed on the pier.

**Operation flow** – The operation flow rates, measured on the ship and at the Terminal, and the total volume moved are checked on an hourly basis and compared between the parties. According to the system used, there is a limit parameter for operational control. Any changes in the operating conditions must be communicated and documented between the parties.

During the operation, it is expressly forbidden to close valves that may cause counter pressure in the system.

**Operations with LPG** – The ship must meet all conditions concerning ships that carry by-products. Additionally, it will be necessary to inform in advance the needs for flow rate or pressure reduction during loading. The Terminal has a particle filter and resources for effectively draining LPG-free water, minimizing the possibility of problems during operations. It also has a vapor return line, which can be used in onboard tank gassing operations or to optimize the loading operations.

**Ballast and slop discharge** – The slop, ballast and deballast piping and tanks must be designated for this purpose only, and remain isolated from other pipes aboard. The water ballast to be discharged into the river must be totally free of oil, any oily residues or other substances that may pollute the river water.

**Tank cleaning** – The COW operation is accepted, conditional on prior authorization within the schedule for purpose of ship laytime in port, and from the Safety Inspector (Giaont) for operational safety purposes.

**Repairs on-board and on the pier** – No repairs or maintenance works involving or that may involve risks of sparks or other ignition means may be performed while the ship is berthed at the Terminal piers. In extreme cases, all the safety rules shall be complied with and fulfilled. Repairs involving the pier facilities, or that imply any restriction on the ship during the laytime, must have prior authorization from the Terminal.

**Safety inspection** – The intermediate inspections, according to Annex A of Isgott, will be carried out by the Safety Inspector (Giaont) during the ship operation.

**Emergency stop** – Any interruption in loading or discharging from the ship must be requested via radio or other communication mean in any situation that might be dangerous either to the ship or the Terminal. The operations must also be temporarily suspended during lightning storms, thunderstorms and/or squalls. The operating personnel at the Terminal are authorized to interrupt or suspend the operation in case of non-fulfillment of any of the safety-related rules and standards globally accepted and adopted in maritime oil transportation. The ship's captain is entitled to interrupt the operation when there are reasons to believe that the operations ashore are unsafe, provided he notifies the pier operators in advance. In any emergency situation, the Terminal of Coari interrupts on-going operations so that all the resources are focused on mitigating the disaster effects. The actions and contacts for each type of emergency are described in the Terminal Emergency Plan, and the main phones are described on the LI-37-00046-Q of Transpetro/DT/TA/Norte/Coari.

## 7.6 Cargo Measurement and Documentation

After finishing the operation, drainage of the loading arms used must be started. The Terminal operators will see to it that the arms used are drained to a closed system on the pier (Sump Tank). The ship representative must arrange for the onboard section to be drained.

**Final measurements aboard** – They will be carried out by the ship's personnel and inspected by the Terminal representatives or other inspectors. The material used must be duly grounded, and the measurement instruments must be explosion-proof.

**Final release of the** – takes place after matching the quantities moved and complementing the laytime documentation.

## **7.7 Unberthing and Leaving the Port**

During the unberthing maneuvers and on leaving port, the channel limits and risks, listed on item 5.3 and its sub-items, must be observed.

The pilot usually travels aboard the ship and disembarks at the same embarkation point for the journey to the TA-Coari, where a port pilotage boat will be expecting him.

## PORT AND ANCHORAGE AREA ORGANIZATION

### 8.1 Port Control (VTS)

No port control resources have been implemented at TA-Coari.

### 8.2 Maritime Authority

The maritime authority to which the Terminal is subordinated is the Harbor Master of Manaus. They are responsible for deciding what actions to take, and for penalizing those responsible for any incident within the port limits.

The Harbor Master determines that the visit from fiscal and sanitary authorities is takes place in Manaus, when the ship is going to the TA-Coari. Occasionally and if formally agreed to in advance, the inspection may happen when the ship returns.

The ships heading for TA-Coari will be visited by the Port Health Inspection, Customs and Federal Police. The ship's agent must take the relevant steps for this.

Each and every document related to the ship clearance at the last port must be presented to the port authorities.

### 8.3 Pilotage

For all ship maneuvers, pilotage is mandatory as from the pilot embarkation point (item 5.3.6).

The pilotage services must be requested via Proa. The request for a pilot must be made by the SC RNNE/Maritime Agency Manaus to Proa (telephones: (55 92) 3624-2164 and 3629-6208; fax: (55 92) 3624-3649). The request must be made 24 hours in advance for ships sailing from Itacoatiara directly to the TA-Coari. If there is any change, the pilotage must be notified 12 hours in advance. For ships leaving Manaus and heading to Coari, the request must be made 24, 12 or 8 hours in advance. If there is any change, the pilotage must be notified 6 hours in advance.

For all the situations, the pilotage service is called into action by the ship's agent. In case of emergency, according to availability, the pilot will embark on the ship at the first available opportunity.

### 8.4 Maritime Services

#### 8.4.1 List of maritime service providers

The list of companies below is merely a courtesy of the TA-Coari, which has no responsibility for the quality of the service provided, terms or qualification of the personnel.

**SC RNNE – Maritime Agency Manaus**

Phone: (55 92) 3616-4358, 3616-4105, 3616-4148

**Translogística – Agência Marítima Ltda.**

Phone: (55 92) 3234-4411

**Nortemar Agência Marítima Ltda.**

Phone: (55 92) 3611-5502

**Triena – Agência Marítima Ltda.**

Phone: (55 92) 3635-2725

**Transerme – Agência Marítimos Ltda.**

Phone: (55 92) 9618-0465

#### 8.4.2 Other relevant maritime services

The release of access to the ship by service providers is conditional on approval from the Asset Inspection service of the TA-Coari.

Without written permission from the Terminal representative, no repair or maintenance work of any nature that may involve the risk of sparks or other ignition means may be performed while the ship is berthed.

***Ship repairs and divers***

Company	Telephone/Fax (55 92)	Specialty
Cavalcante e Silva Ltda.	3641-0061 Cel.: 9961-6104	Electrical, mechanical, painting and civil construction
Rio Urucu Navegações	3624-7744, 9137-7021 9613-4659	Road, maritime and river transport, and mechanical naval maintenance
Conquista Empreendimentos Ltda.	3631-8814, 9146-5265	Naval maintenance: electrical, mechanical and civil construction
Reval Reparadora Naval Ltda.	3249-1528	Dockage, mechanical and diving

***Support Vessels***

The Terminal has two diesel-propelled vessels with steel wire for helping with berthing and unberthing. It is mandatory to summon the Terminal vessels for the maneuvers. The call is made directly by the pilot.





# EMERGENCY PLAN

## 9.1 Emergency Contacts

The table below indicates the essential contacts, with telephone and fax numbers, and radio channels/frequencies.

Organization	Operating Times	Identification Acronym	Telephone (55 92)	Fax (55 92)	Cell phone (55 92)	VHF/UHF Call
Harbor Master	24 hours	CFAOC	3621-1800	3633-2334	9168-2093 9168-2100	16
Harbor Master, Disk Navigation Safety	24 hours	CFAOC	0800-280 7200	—	—	16
Pilot Association	24 hours	Proa	3624-2164	3624-2406	9987-9165	16
Pier-1 operator watchpower	24 hours	POF-1	3617-2619	—	—	03
Pier-2 operator watchpower	24 hours	POF-2	3617-2618	—	—	03
TA-Coari Control Room	24 hours	—	3617-2604	3617-2641	—	03
Technical support Protam	24 hours	—	3617-2609	—	—	04

*continue*

Organization	Operating Times	Identification Acronym	Telephone (55 92)	Fax (55 92)	Cell phone (55 92)	VHF/UHF Call
TA-Coari Coordination	7h30 às 19h30	Coordinator	3617-2680	3617-2603	9983-3226 9984-9216	03
Manaus Fire Depart.	24 hours	—	193	—	—	—
Civil Defense Coari	24 hours	—	195	—	—	—
Environment Secretariat of Coari	8 às 17h	—	3561-2969	—	—	—
Ipaam	24 hours	Ipaam	3643-2300	—	—	—
Ibama	24 hours	Ibama	3613-3277 0800-618080	—	—	—

## 9.2 Environmentally Sensitive Areas

The Emergency Plan of the TA-Coari describes the areas most sensitive to environmental impacts, listed by sensitivity maps. According to the area selected, the points subject to the greatest impact are shown (Annex of the PEL, item 4.12, Vulnerable Areas).

## 9.3 General Description of the Emergency Combat Organization

The chart below presents the organizations in charge of handling any emergencies that involve the ships arriving to the Terminal.

### Incidents within the Port/Terminal Area

Incident type	Organization in Charge	Other Organizations Involved			
Collision on the channel	Harbor Master	Civil Defense	Transpetro	—	—
Ship running aground	Harbor Master	Civil Defense	Transpetro	—	—
Collision at the berth	Harbor Master	Transpetro	Civil Defense	—	—
Ship sinking	Harbor Master	Civil Defense	Corpo de Bombeiros	Transpetro	—
Fire aboard	Navio	Transpetro	Fire Department	Civil Defense	Harbor Master
Fire in the berth	Transpetro	Fire Department	Civil Defense	Harbor Master	—
Pollution	Transpetro or ship	Harbor Master	Environment Secretariat of Coari	Ipaam	Ibama

## 9.4 Emergency Plans

The Local Emergency Plan (PEL) is the emergency combat plan of the TA-Coari at all its facilities. It is available in all operational areas, on boards located in the operation maintenance rooms and administrative building entrances. The local SMS (health, environment and safety activity) is responsible for updating this.

The TA-Coari has an Emergency Response Center (CRE) with modern equipment and various facilities for use in pollution accidents. Intensive training sessions are held periodically so that the Terminal employees are qualified to act according to the LEP. Located at a strategic point, it can be ready for action to combat emergencies. Floating booms, oil collectors and other equipment and materials required for the house are stored at the Terminal. The service boats, support boats, tankers and oil collecting vessels are berthed on the dry load pier and next to the oil pier, in a permanent state of readiness.

The Terminal has an ambulance boat for taking patients to Coari. A nurse works on a rota basis during those periods with the greatest concentration of people due to maintenance and work services. The serious cases or the cases that occur out of business hours will be taken to the city hospital, located in the city of Coari (approximately 16 km away from the Terminal).

### 9.4.1 Preventive measures on board

The emergency and fire fighting equipment must be kept ready for use while the ship is berthed. The operational fire hoses must be extended, one forward and one aft of the loading manifolds.

A pollution fighting kit (sawdust, rags, shovels, buckets, squeegees, transfer pumps, etc.) must be kept ready for use in case of oil spilling. Supplementary precautions must be taken, so as to avoid polluting the river water with oil.

## 9.5 Public Resources for Combating Emergencies

At Port of Coari, Transpetro, via the TA-Coari, and other operational units, called into action under the Local Emergency Plan, have resources that can be used to mitigate events of river pollution. For other emergencies, the public organizations offer resources according to the purposes for which they are designated.

### 9.5.1 Local emergency services

Civil Defense, Military Police and the Coari hospital unit are brought into action according to the table on item 9.1.

### 9.5.2 Mutual Assistance Plans

The following institutions participate in the Mutual Assistance Plan (PAM), and their resources are available as agreed to in advance in this plan:

- Military Police Fire Department
- Transpetro/TA-Coari
- Petrobras/Isaac Sabba – Reman Refinery
- Petrobras/UN-BSOL
- Petrobras Distribuidora/BR

## 9.6 Combating Oil Spills

The items below describe the resources available for combating pollution in the areas adjacent to the Terminal.

### 9.6.1 Pollution-combat capacity of the Terminal

The resources available at the Terminal for combating oil spillage situations are listed in the PEL, which is available in all the administrative, operational and maintenance areas of the TA-Coari.

### 9.6.2 Combat Capacity of the environmental agency

The Environment Secretariat of Coari does not have resources to combat oil spills in the river.

### 9.6.3 Resources available from the Mutual Support Plans at other Terminals

The need for resources available at other Transpetro Terminals for combating pollution emergencies occurring in the areas adjacent to the Terminal, must be defined by the General Emergency Command.

### 9.6.4 Combating a small emergency

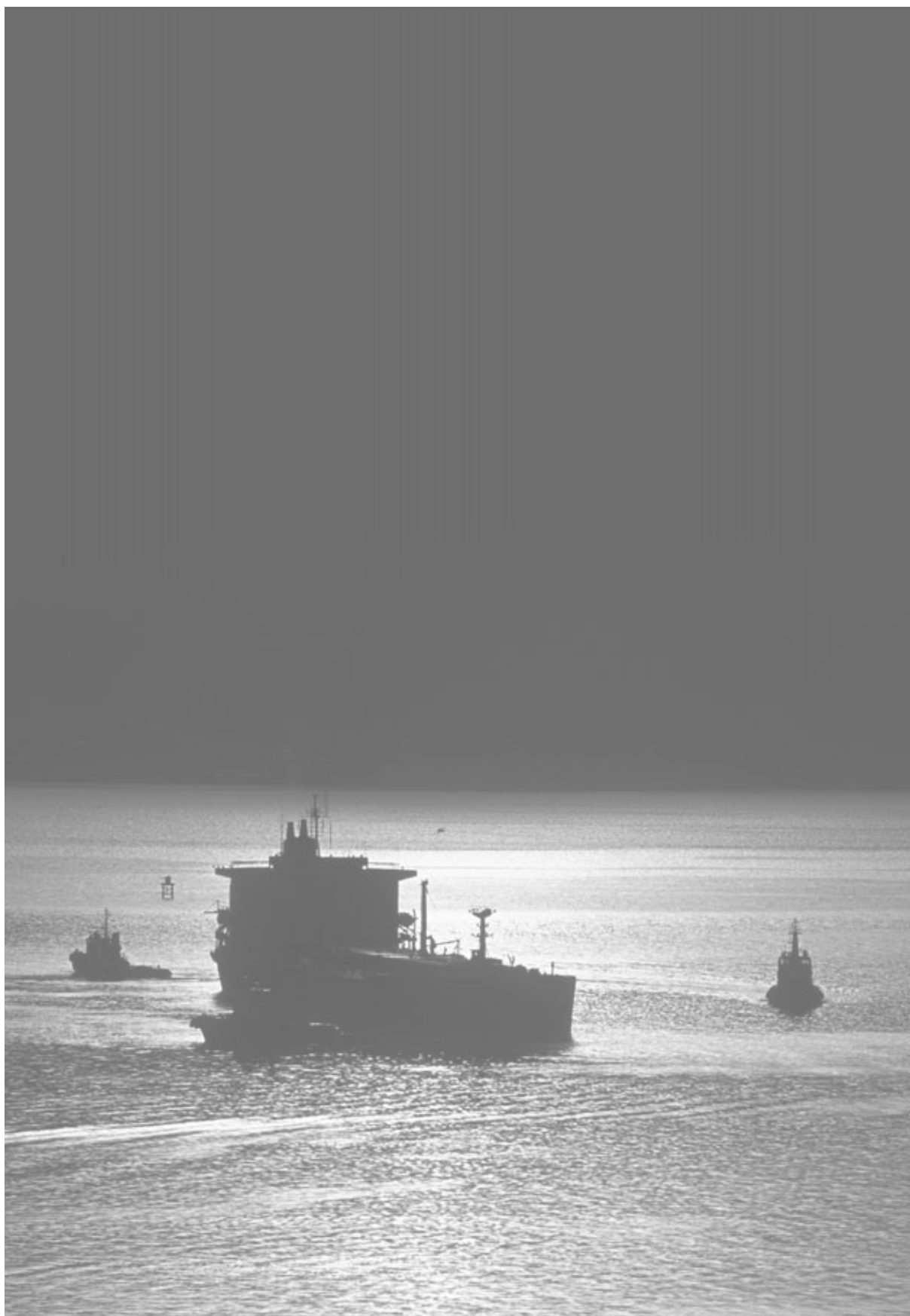
A small emergency is one that can be controlled and extinguished with local resources.

### 9.6.5 Combating a medium-size emergency

A medium-size emergency is one that can be controlled and extinguished with resources from Transpetro/DT/TA-Norte/Coari and from external organizations. The local resources are described in the PEL, and the external resources must be requested by the General Emergency Command.

## 9.7 Combating a Large-scale Emergency

The PEL at the TA-Coari lists the actions and the entities with responsibility for every expected type of event that may occur in its units, pipelines or vessels, involving third parties. For events not included in this document, Transpetro and Petrobras will provide all the national or international resources available.



# CONTACTS

## 10.1 Terminal

Location	Contact	Telephone (55 92)	Route	VHF/UHF Channels	
				Call	Conversation
POF-1 Berth	Operator	3617-2619	841-2619	06/09	06 ou 09
POF-2 Berth	Operator	3617-2618	841-2618	06/09	06 ou 09
Control Room	Operator	3617-2604	841-2604	03	03
Shift Supervisor	Supervisor	3617-2633	841-2633	03	03
Security (SMS)	Safety tech.	3617-2612	841-2612	04	04
Inspection	Inspector	3617-2622	841-2622	05	05

## 10.2 Port Services

Organization	Contact	Telephone (55 92)	Fax (55 92)	E-mail	VHF/UHF Channels	
					Call	Conversation
Harbor Master	Oficial de serviço	3621-1800 9168-2093	3633-2334	www.cfaoc.mar.mil.br	16	16
Pilot Association	Pilot in shift	3624-2164 9987-9165	3624 2406	www.diretoria@proamaneaus.com.br	16	16

### **10.3 Local Authorities, State and National Agencies**

Item 9.1 lists these authorities and their respective contacts.

### **10.4 Emergency Combat Organizations**

The emergency combat organizations available at the port are listed in the item 9.1.



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Atlas da Hidrovia do Rio Solimões de Manaus a Tabatinga – 4150, 1<sup>st</sup> edition, 2001 – DHN  
– Diretoria de Hidrografia e Navegação.

Nautical Charts 4107 A/B and 4108 A/B. Brazilian Navy.

Normas e Procedimentos da Capitania dos Portos da Amazônia Ocidental – NPCP.

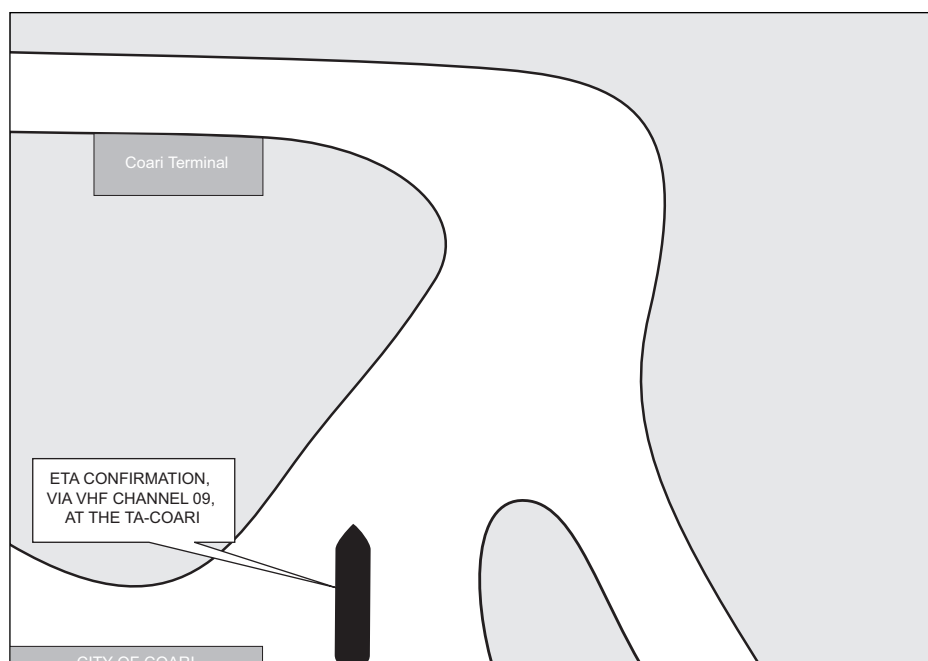
Nautical Route of the Northern Region. Diretoria de Hidrografia e Navegação. Brazilian Navy.



## APPENDICES

### A – Berthing routes in the oil pier

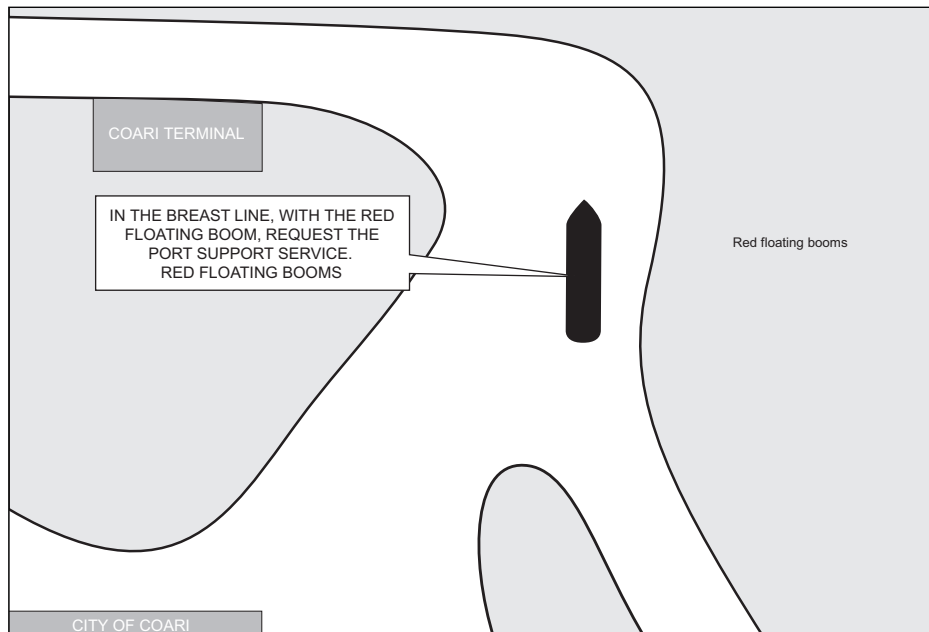
#### A1 – Approximation at TA-Coari – ETA confirmation



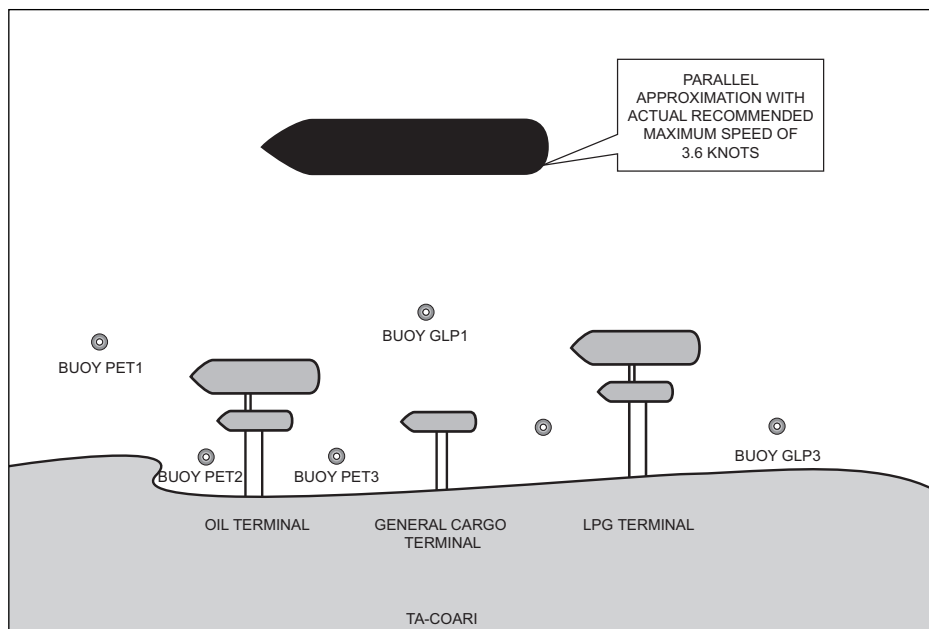
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apêndice

COARI TERMINAL

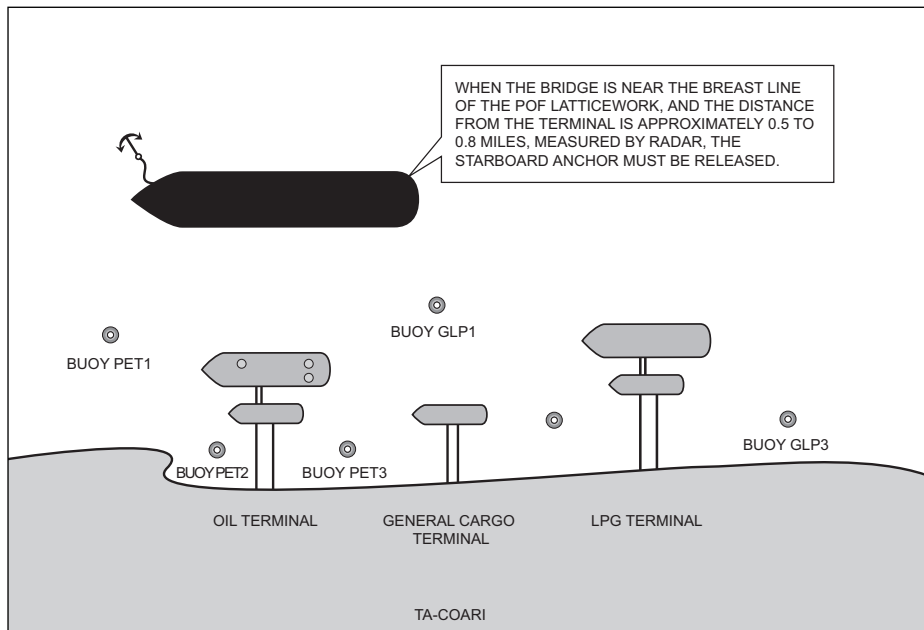
## A2 – Request for Port support



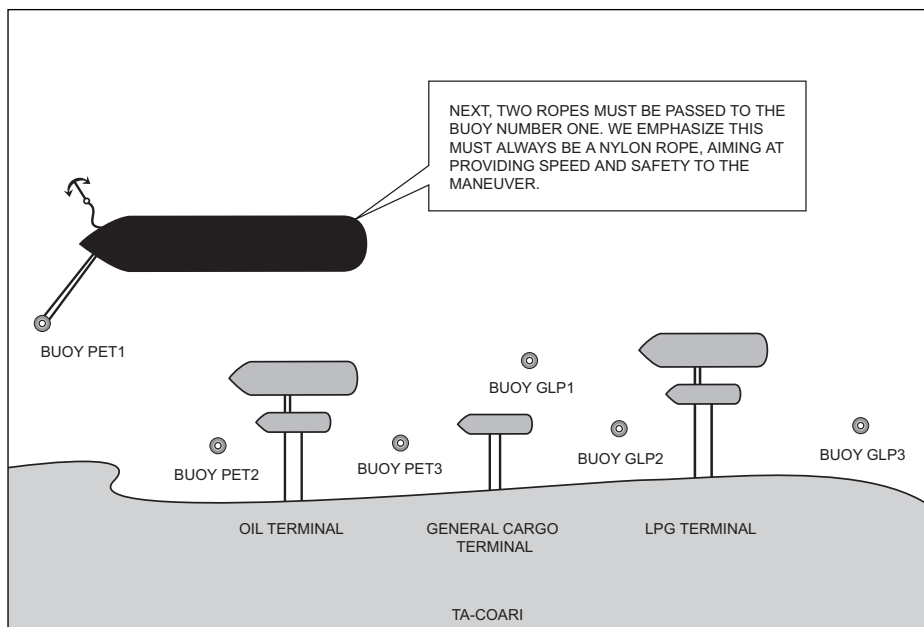
## A3 – Approximation for berthing



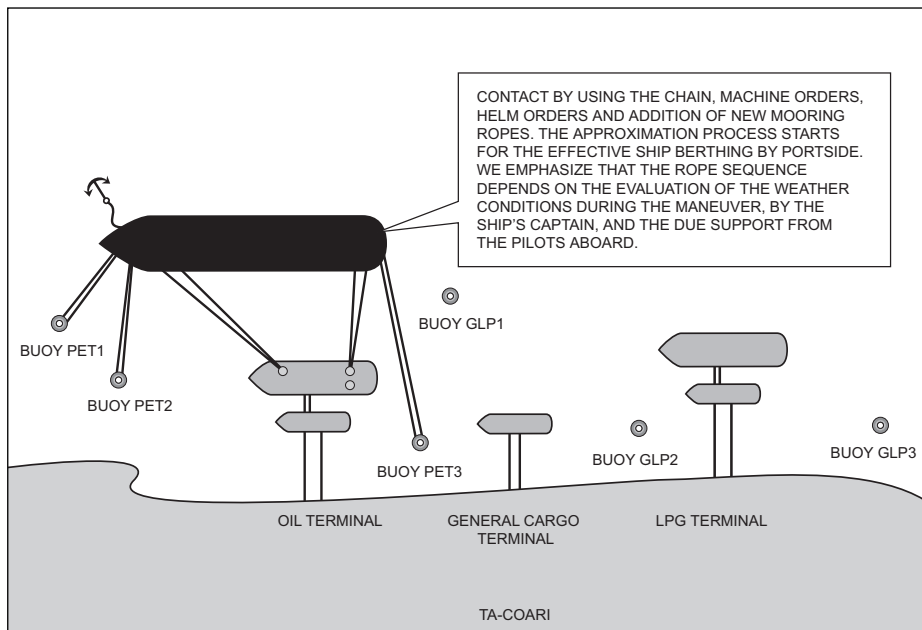
## A4 – Anchorage



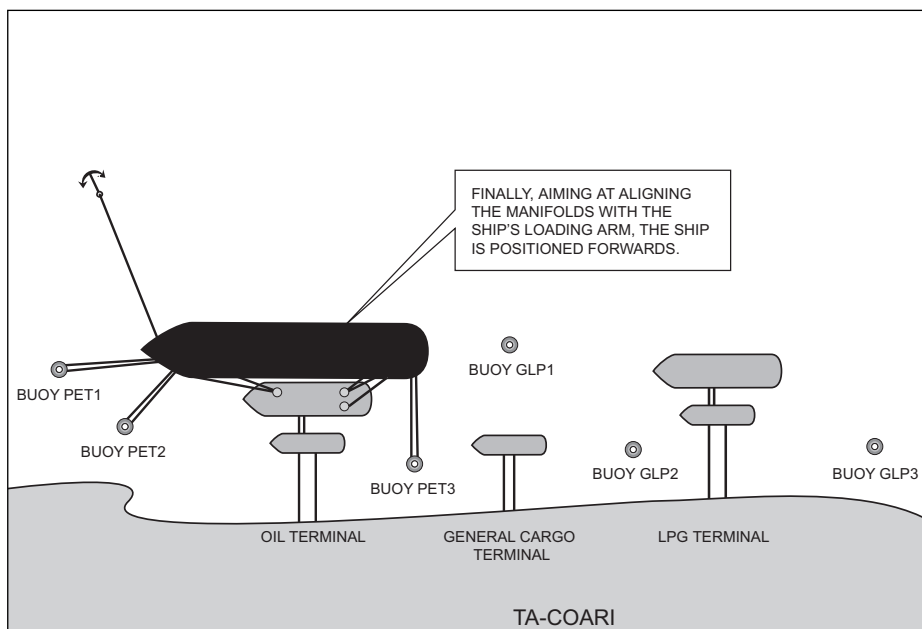
## A5 – Mooring start



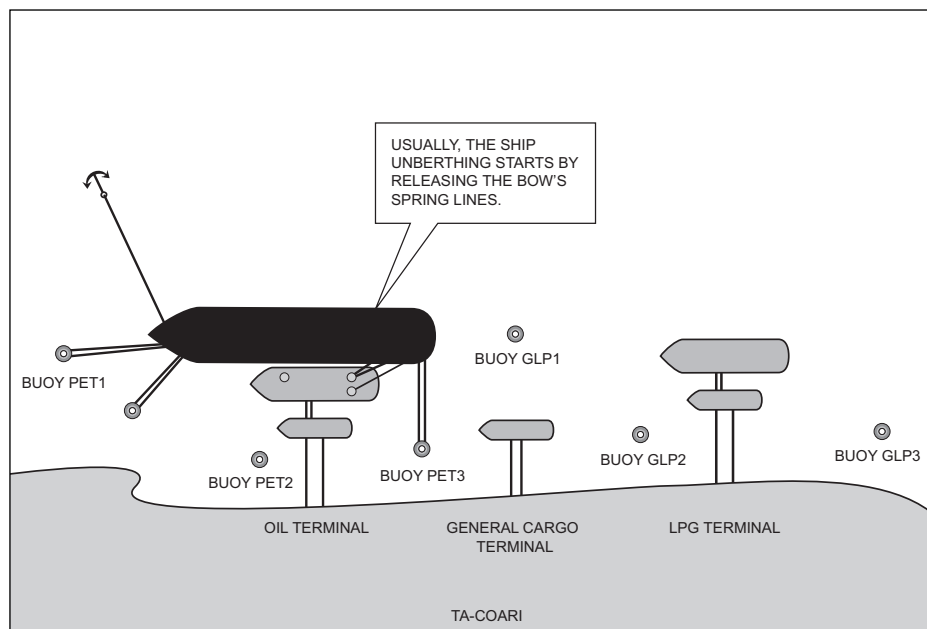
## A6 – Berthing



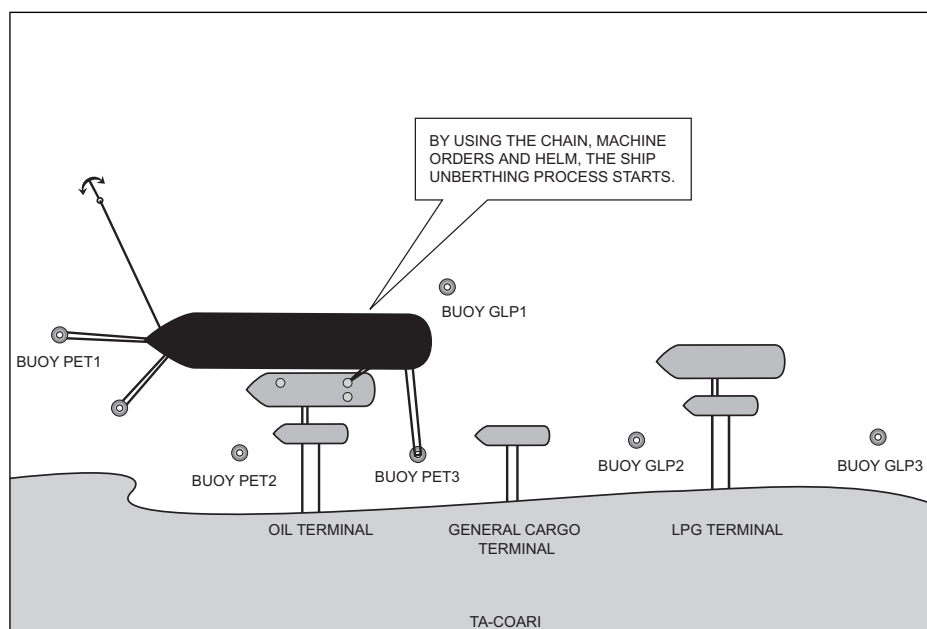
## A7 – Berthed ship



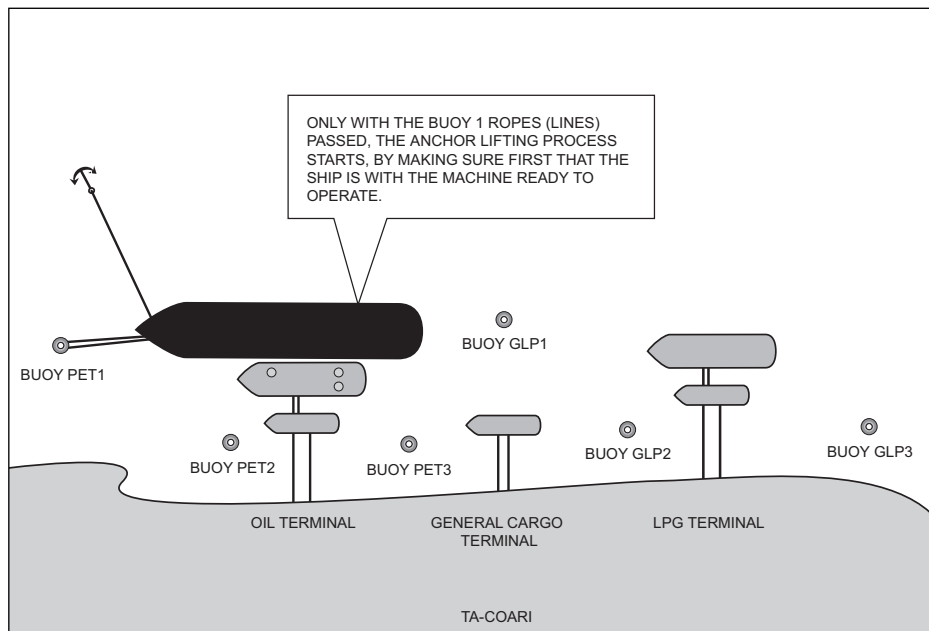
## A8 – Unberthing start



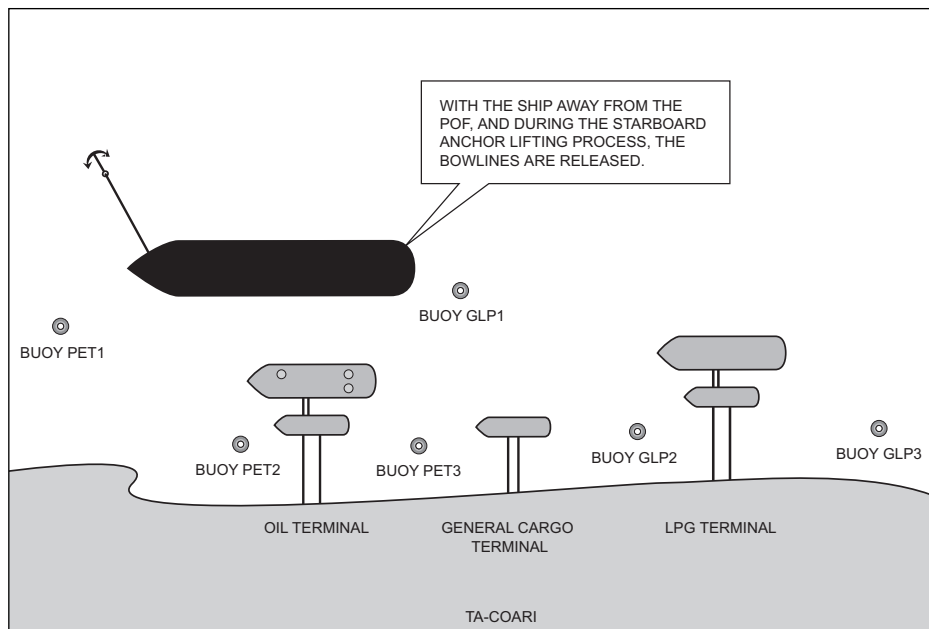
## A9 – Releasing the bow and stern breast lines



## A10 – Releasing the stern spring lines

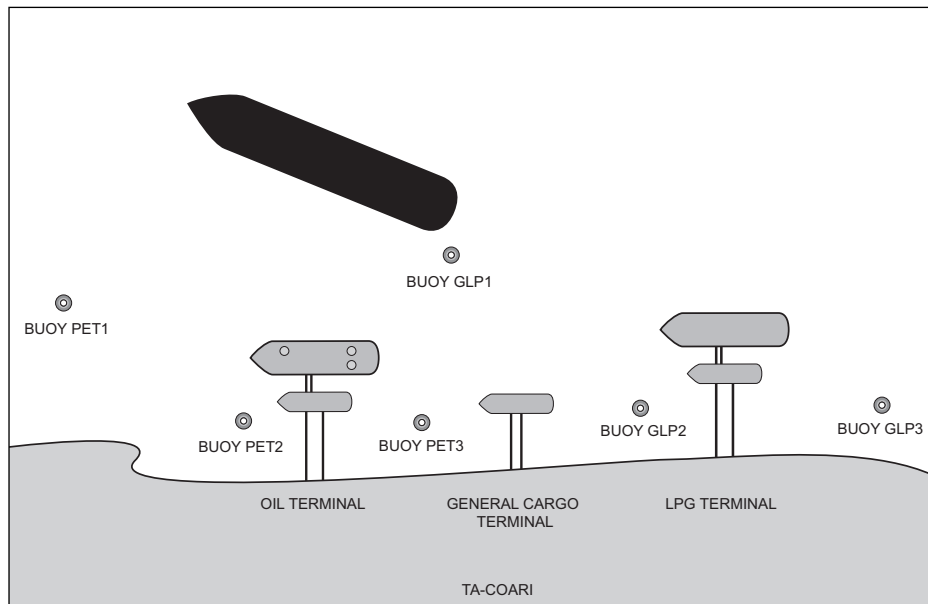


## A11 – Starting the anchor lifting



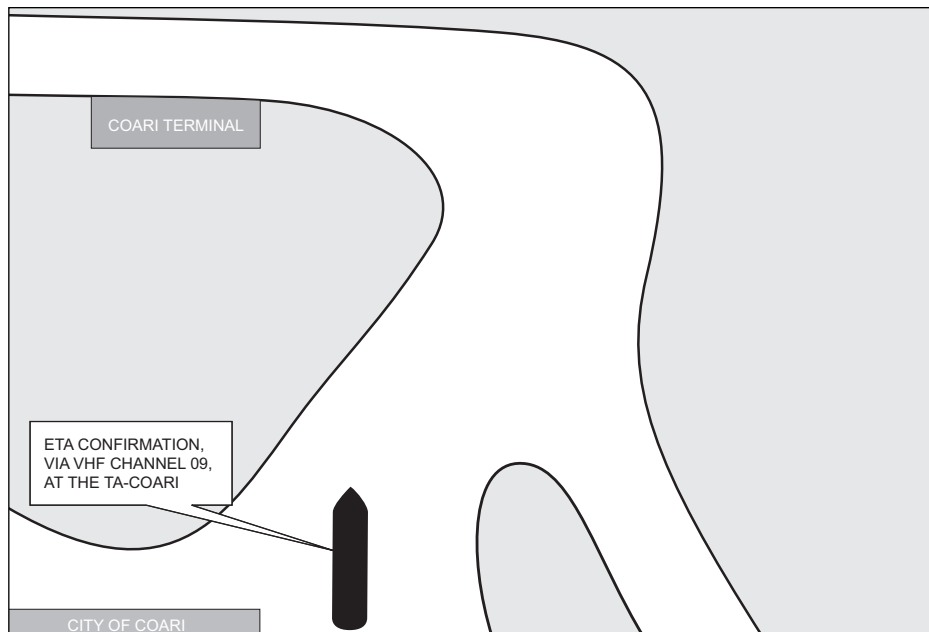


## A12 – Putting the anchor in its upper position and starting the turn by starboard

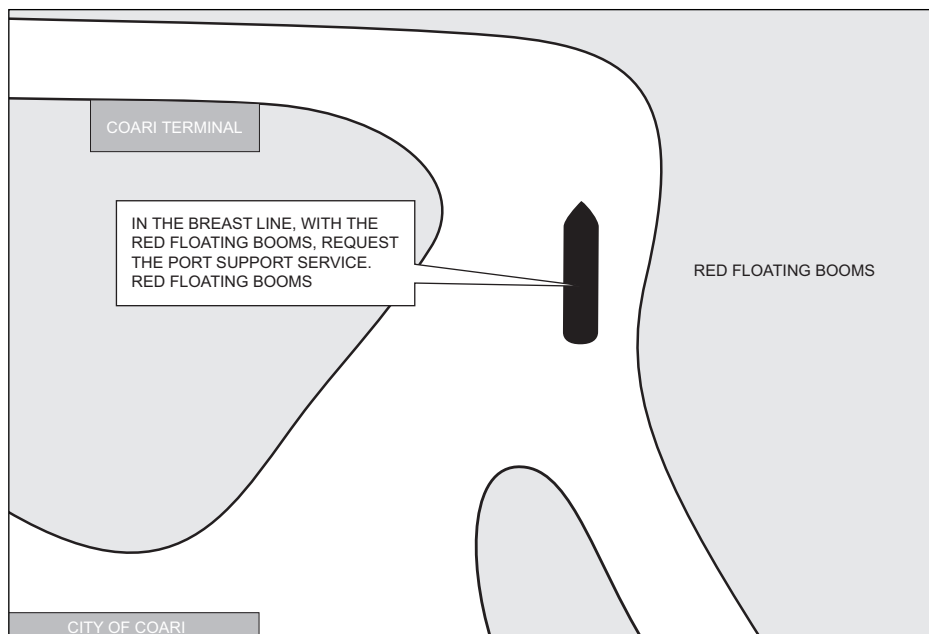


## B – Berthing routes in the LPG piers

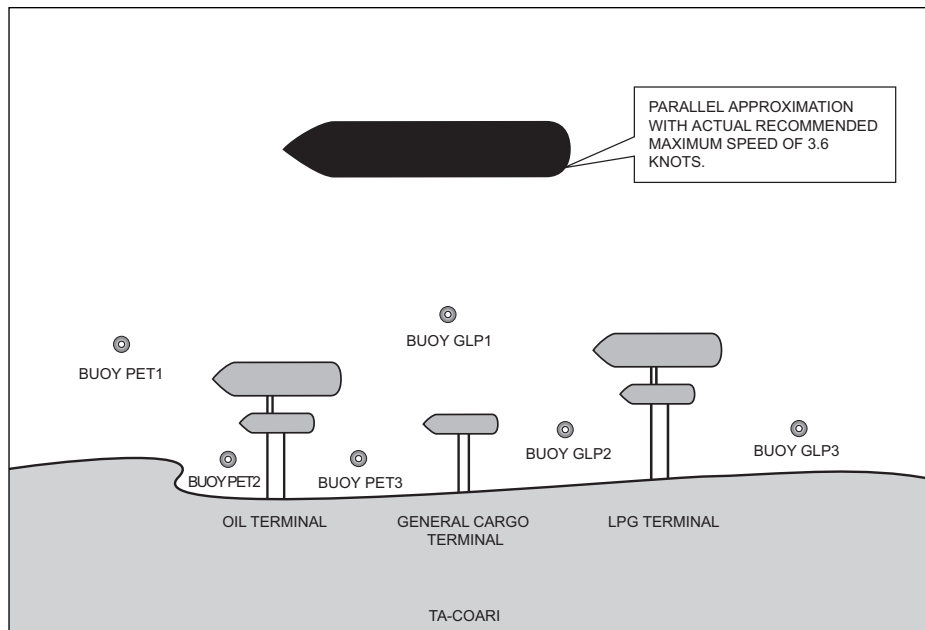
### B1 – Approximation at TA-Coari – ETA confirmation



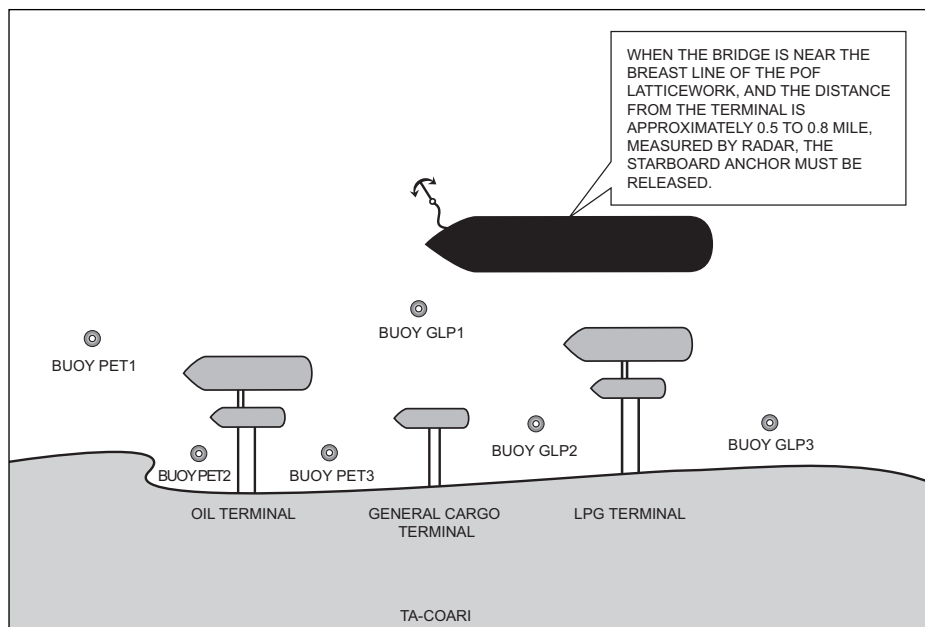
### B2 – Request for Port support



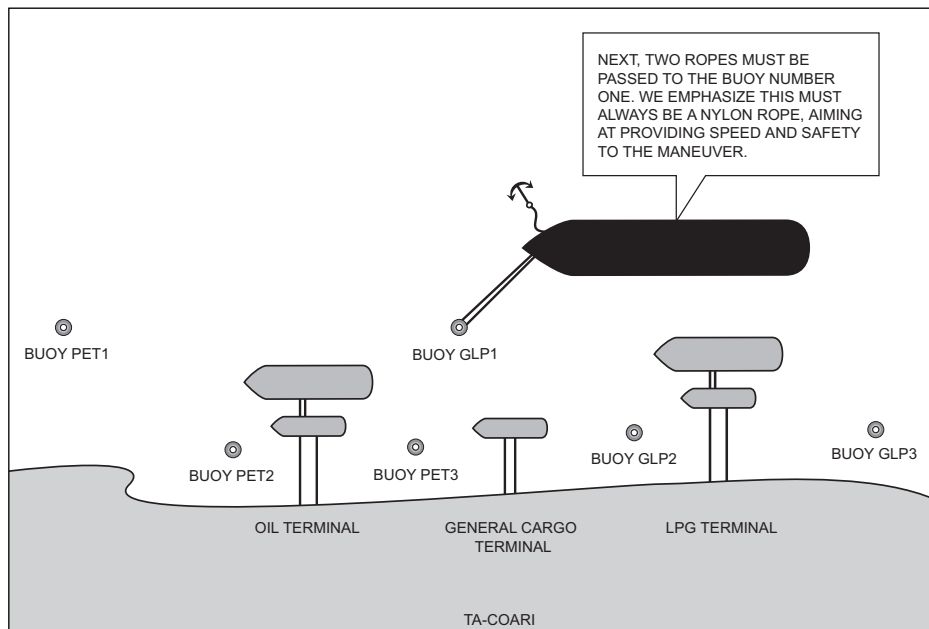
### B3 – Approximation for berthing



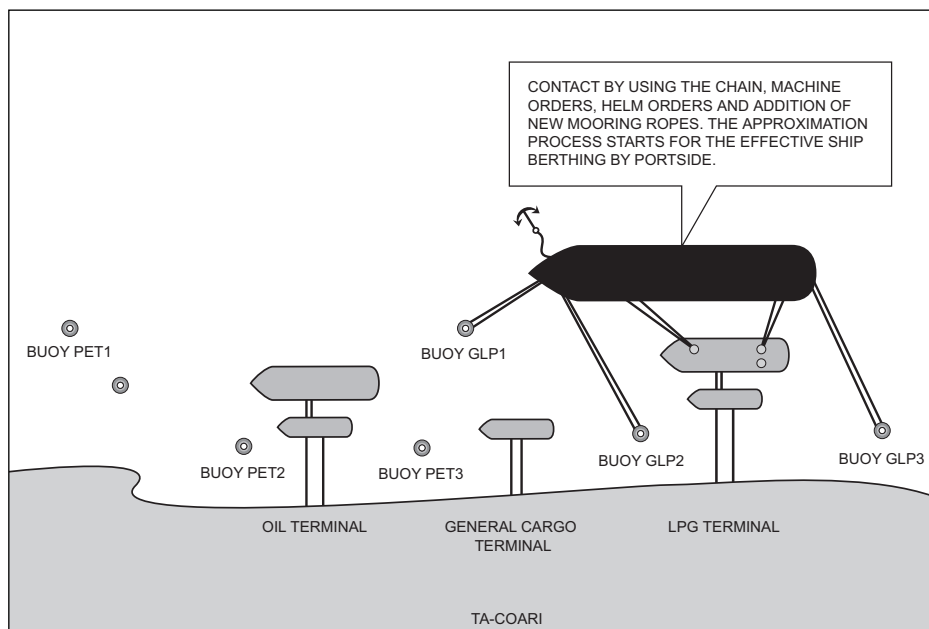
### B4 – Anchorage



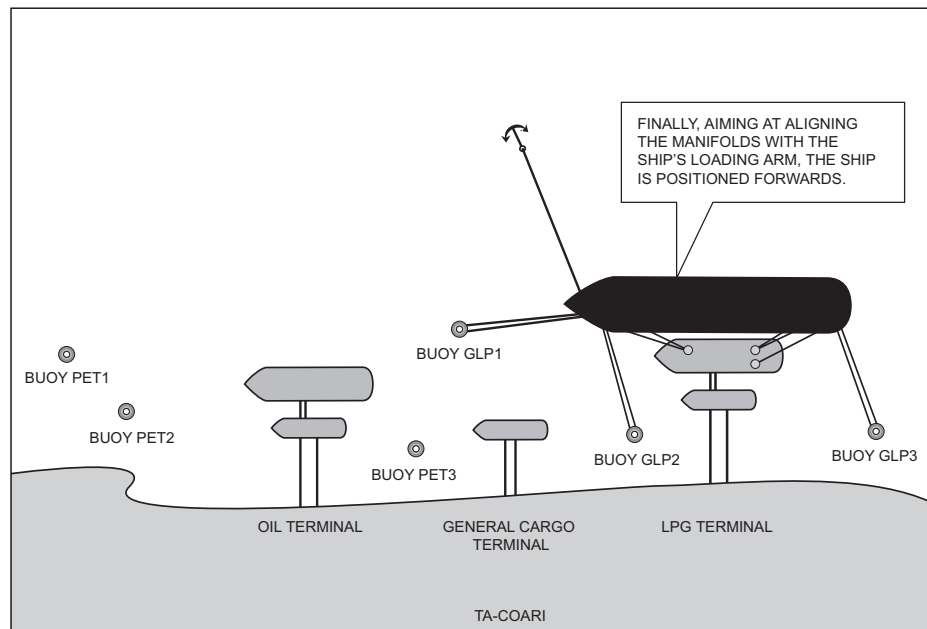
## B5 – Mooring start



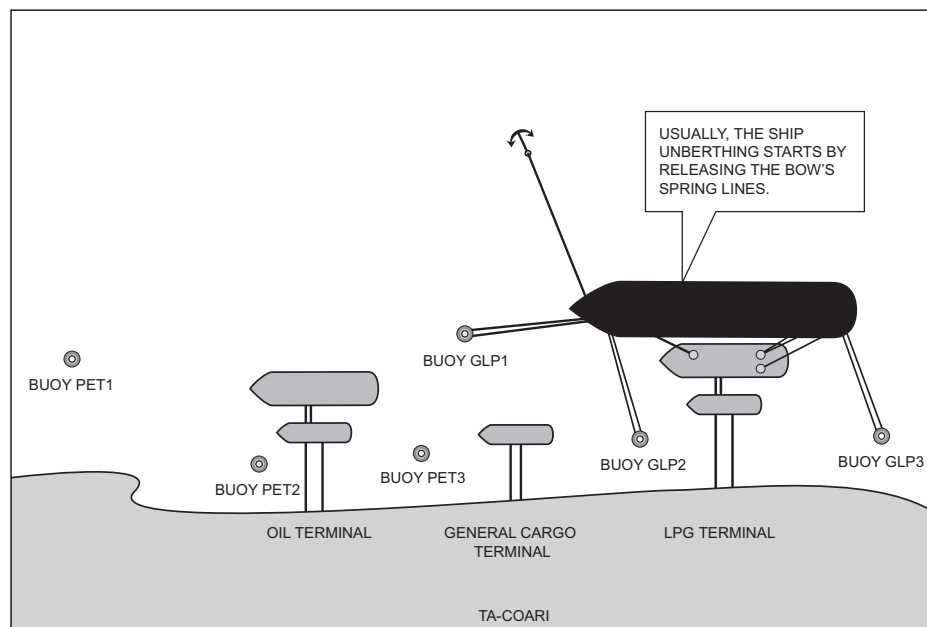
## B6 – Berthing



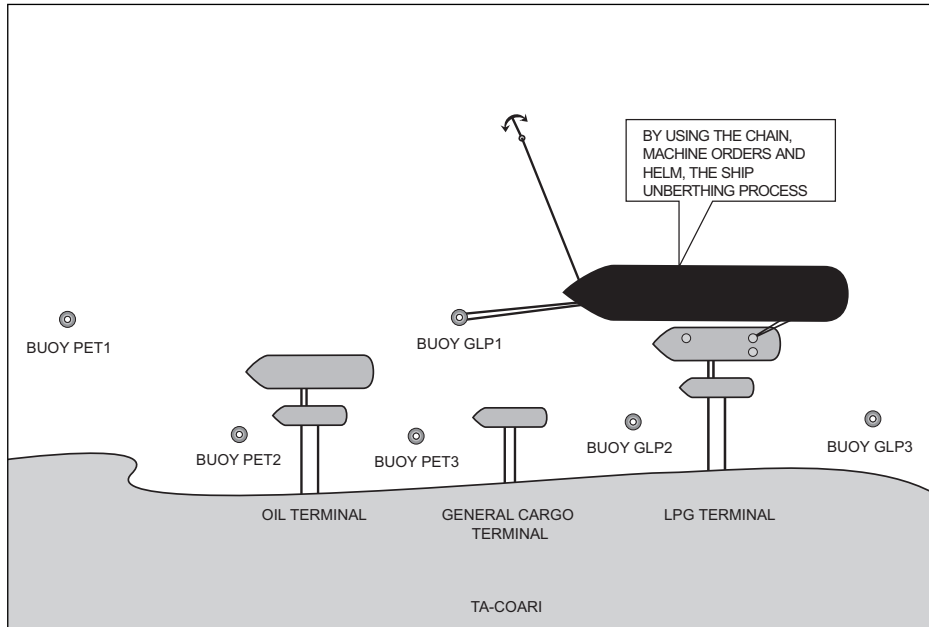
## B7 – Berthed ship



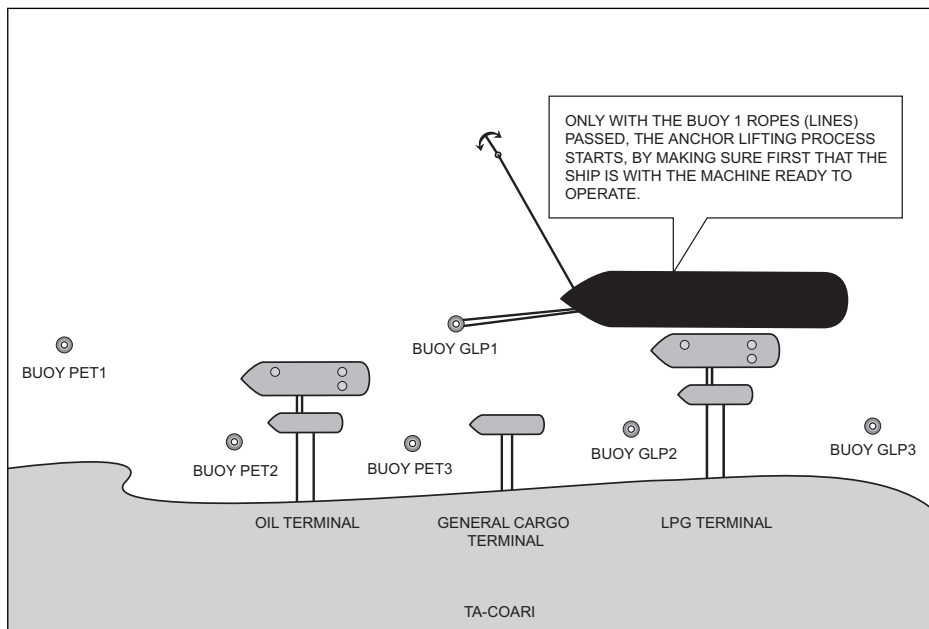
## B8 – Unberthing start



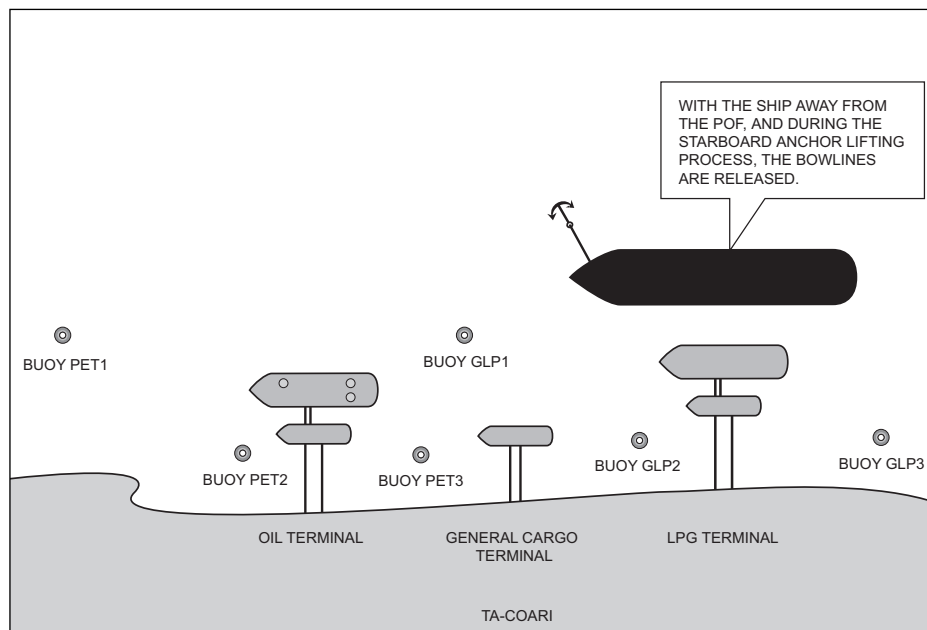
## B9 – Releasing the bow and stern breast lines



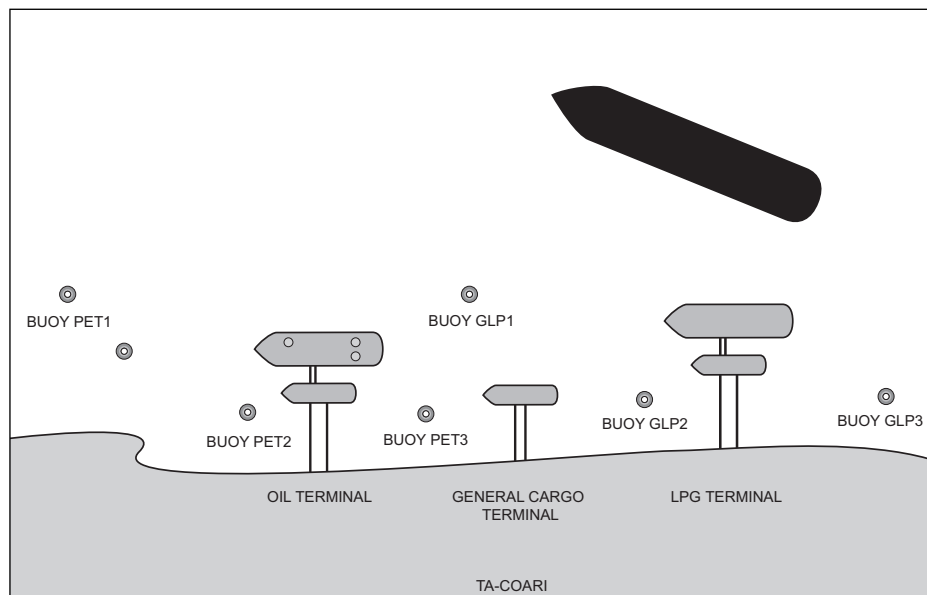
## B10 – Releasing the stern spring lines



### B11– Starting the anchor lifting



### B12 – Putting the anchor in its upper position and starting the turn by starboard



### C – Port of TA-Coari (Basic diagram)

