# CHIM SAO MARINE TERMINAL INFORMATION AND REGULATIONS

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<td>Santos Petroleum Ventures B.V</td>
<td>16 Chief of Support Operation Division</td>
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<td>17 Manager Liquids Marketing</td>
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<td>PVN - PVEP</td>
<td>18 Operations Manager</td>
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<td>19 Vung Tau Harbour Master</td>
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<td>5.4.3 Dua tie-back</td>
<td>Added the description of Dua subsea facilities</td>
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<td>5.4.9 No Anchoring &amp; No Fishing Zones</td>
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1 INTRODUCTION

At the date of this Terminal Handbook, the production license for Block 12W is held by the following corporations, which have jointly designated POVO as the operator:

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<tr>
<td>PREMIER OIL VIETNAM OFFSHORE BV</td>
<td>28.125%</td>
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<tr>
<td>PETROVIETNAM EXPLORATION &amp; PRODUCTION CORP.</td>
<td>15%</td>
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<tr>
<td>SANTOS PETROLEUM VENTURES B.V.</td>
<td>31.875%</td>
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<tr>
<td>PREMIER OIL (VIETNAM) LLC</td>
<td>25%</td>
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These Terminal Regulations are intended to provide information to owners, operators, managers, charterers and Masters of tankers with regard to safety regulations, general conditions, terminal facilities, and available services at the Terminal.

POVO’s priorities are:

- safety of its personnel and those of its contractors, of vessel personnel and those of its contractors, and of the general public;
- protection of the environment; and
- provision of reliable and cost-effective transfer of Chim Sao crude to its lifters/Lifting Parties.

2 DISCLAIMER

The information contained in these Terminal Regulations is believed to be correct at the time of issue; however, POVO does not guarantee the accuracy of the information and accepts no liability for any damage, delay or loss resulting from any inaccuracy contained herein.
3 DEFINITIONS AND ABBREVIATIONS

In all that follows, and in regards to all Terminal information, regulations and conditions of use, the following terms shall have the following meanings:

“Affiliate” means any company or other entity that directly or indirectly through one or more intermediary, controls or is controlled by or is under common control with a party referred to herein this Terminal Handbook. “Control” means ownership of more than fifty (50) percent of the voting stock of the controlled company or the direct or indirect right to determine its actions by contract or otherwise.

“Alert Offtake Sector” A sector of 30° -45°on either side of FPSO centerline where, if OT should enter this sector, sufficient time should still exist for Static Tow Boat to bring the OT motion and mooring hawser angle under control, and effect the return of the OT to the safe area without entering the unsafe area.

“Barrel (BBL)” - A unit of volume equal to 42 U.S. gallons or 9702.0 cubic inches.

“Breakaway Coupling” means the double closure breakaway coupling fitted between the 3rd and 4th sections of the floating hose at the Offtake Tanker's end, which in the case of mooring failure during loading operations, that coupling is designed to part, sealing off the two (2) hose sections by means of self-closing valves, thus prevent the hose rupturing and avoidance of a pollution incident.

“Camlock Coupling” means the quick connect and disconnect coupling mounted on the end of the floating hose connecting the floating hose flange to the Offtake Tanker's manifold.

“CAP” means “Condition Assessment Program” for tanker.

“CBT” means “Clean Ballast Tank”

“DWT” “Dead Weight Tonnes” means the total cargo plus bunkers and stores that a ship can carry up or to her Plimsoll line or marks, stated in metric tonnes.

“EDP” “Early Departure Procedures" or shall have the meaning set forth in Section 16.3.

“EQUASIS” Information system on quality and safety-related information of the world merchant fleet. The latest Memorandum of Understanding (MoU) for Equasis was signed on the 2nd July 2009 in London. The MoU was signed by the following member states: The United Kingdom, France, Spain, Norway, Japan, The Republic of Korea and Canada. The MoU was also signed by the European Maritime Safety Agency (EMSA), acting as representative of the European Commission.
“ESDV” Emergency Shutdown Valve – Remote operated valve located at the FPSO aft manifold for emergency shutdown of Offtake stream to the tanker

“ETA” means the estimated date and time of arrival (local time at the Terminal) of a vessel at the Arrival Point.

“Field” means the Chim Sao field located in Block 12W, off the east coast of Peninsular Malaysia and the southwest coast of Ca Mau, Vietnam.

“FPSO” means the floating production storage and offloading Vessel “Lewek Emas” and all its associated equipment and facilities.

“FSO” “Facility Security Officer” means the PVTEC employee in charge of FPSO security as defined in the ISPS Code.

“Hs” Significant Wave Height – Approximately equal to the average of the highest one-third of recorded waves

“IALA” means the “International Association of Lighthouse Authorities”.

“ICS” means the “International Chamber of Shipping”.

“IMO” means “International Maritime Organization”.

“Indemnified Parties” means each of the Producers and their respective Affiliates, the Mooring Master(s), the owners, disponent owners, operators, master, officers and crew of the Terminal and all Support Vessels or other craft rendering services at the Field, and the subcontractors, directors, officers, employees, servants, and agents of each of them.

“IOPPC” means an “International Oil Pollution Prevention Certificate”.

“ISGOTT” means the “International Safety Guide for Oil Tankers and Terminals”.


“Lifter/Lifting Party” means a Party or Parties which is entitled and obligated to Lift a Cargo of Crude Oil under a Firm Lifting Programme.

“Loading Range” means the period of consecutive days set out in the lifting Programme during which Lifter’s Qualified vessel is required to tender its Notice Of Readiness.

“LT” means “Local Time”.

“MARPOL” means the “International Convention for the Prevention of Pollution from Ships 1973” as modified by the protocol of 1978 relating thereto (MARPOL73/78) and any amendments thereto.
“Mooring Master” means a person whose services are provided to Offtake Tankers by the Terminal and who advises and assists Offtake Tanker Masters in navigation, maneuvering, pilotage, mooring, loading and unmooring of Offtake Tankers at the Terminal; the term “Mooring Master” shall include the employer of any such Mooring Master, or the agent of any such employer.

“MWPGB” Multi-Well Production Guide Base

“Offtake Tanker” means a tanker nominated and accepted to load a cargo of Chim Sao Crude Oil at the Terminal

“Offtake Tanker Master” means the master of the Offtake Tanker.

“Offtake Tanker Owner” means any registered, disponent or beneficial owner, part owner, charterer, operator, manager, mortgagee in possession and agent of an Offtake Tanker.

“Operations Supt.” “Operations Superintendent” means the person appointed by POVO to coordinate all vetting and lifting related activities and complete all lifting documentation.

“OCIMF” means the “Oil Companies International Maritime Forum”.

“OCIMF – SIRE VIQ” OCIMF – SIRE Vessel Inspection Questionnaire

“OCIMF – SIRE VPQ” Vessel Particulars Questionnaire in the OCIMF SIRE Programme format

“OIM” “Offshore Installation Manager” means the PVTEC manager with immediate and overall responsibility for all FPSO, WHP and Lifting operations.

“Operations Offshore Representative” POVO appointed person based on the FPSO who has immediate responsibility for all infield activities.

POVO Premier-Oil Vietnam Offshore BV – Chim Sao Terminal operator

“Pilot Boarding Ground” means the location where Pilot and Mooring Master board the Offtake Tanker before mooring operations takes place. It can be either at the Anchorage Area or another location which is determined by the Mooring Master as safe for personnel transfer.

“Producers” means the legal persons that, from time to time, are entitled to a share of crude oil produced pursuant to the Block 12W Production Sharing Contract, at the date of this Terminal Handbook being PREMIER OIL VIETNAM OFFSHORE B.V., [PREMIER OIL VIETNAM (BLOCK 12) B.V.], PREMIER OIL (VIETNAM) LLC, VIETNAM OIL AND GAS GROUP, PETROVIETNAM EXPLORATION PRODUCTION CORPORATION LIMITED (“PVEP”) and SANTOS PETROLEUM VENTURES B.V.
“PVTEC” Joint Venture established to operate Chim Sao oilfield facilities

“Restricted Zone” means an area extending two (2) nautical miles around the offshore installations for purpose of safety of navigation and offshore installations. All unauthorized vessels are prohibited from anchoring, fishing, trawling inside this zone.

“Safe Berthing Sector” A sector of 15° on either side of FPSO centerline within which the Offtake Tanker can approach for mooring to FPSO

“Safe Offtake Sector” A sector of 30° on either side of FPSO centerline within which mooring hawser and offtake tanker fishtailing motions are controllable and Offtake Tanker (OT) remains in a reasonable steady state in relation to the FPSO, with reasonably constant tow force and direction from the Static Tow Boat

“Safety Zone” means an area extending five hundred (500) meters from outer most perimeters around the offshore installations as shown in section 5.1. All unauthorized vessels are prohibited from entering this zone.

“shall” means a mandatory instruction.

“should” means a recommended instruction.

“SIRE” means “OCIMF Ship Inspection Report Program”.


“Chim Sao Marine Terminal” or “Terminal” means the FPSO, including the Restricted Zone located in Block 12W offshore Vietnam.

“SOPEP” means “Shipboard Oil Pollution Emergency Plan”.

“Static Tow” means the Support Vessel made fast to the stern of the Offtake Tanker before mooring in tandem to the Terminal, whilst moored to the Terminal and until the Offtake Tanker casts off and clears all facilities in the Field.

“STCW” means the “International Convention on Standards of Training, Certification, and Watchkeeping for Seafarers”.

“Support Vessel” means a Vessel provided by POVO and is used to assist in the berthing or unberthing of an Offtake Tanker, providing a Static Tow, the handling of the mooring hawser and/or floating hose, or other support services at the Field.

“SWL” means safe working load, herein expressed in metric tonnes.

“Surveyor” means an independent cargo surveyor appointed by POVO or relevant lifting parties to observe the lifting operation.

“Terminal Charge” means the nominal charge for normal services supplied by the Terminal, as described in subsection 5.4.14.
“Terminal Handbook” means the most current version of this document entitled, “Chim Sao Marine Terminal Regulations and Information” including all the appendices and diagrams, which are attached hereto and any amendments, made from time to time.

Terminal Representative means Premier-Oil Operations Superintendent who coordinates offshore offtake operations or in his absence Mooring Master.

“Terminal Services” means all and any services, facilities, berth(s), equipment, property, craft, personnel, assistance, advice, directions or instructions given or tendered (whether compulsorily, voluntarily or otherwise and whether or not for consideration) by or on behalf of the Indemnified Parties at or in relation to the Terminal, the Offtake Tanker or the Field directly or indirectly in connection with the offtake of crude oil from the Terminal by an Offtake Tanker, including but not limited to pilotage, navigational assistance, berthing services, the provision of navigational facilities (including buoys or other channel markings), mooring, towage, tug or Support Vessel services, personnel and equipment transfer via Support Vessel or other means, custody transfer of cargo and communication facilities.

“TMSA” Tanker Management Self-Assessment system set up by OCIMF for tanker operator self-evaluation on their own management system.

“TPAM” Twin Pipeline Active Manifold.

“Unsafe Offtake Sector” A sector beyond 45° either side of the centerline of FPSO where, should the OT enter this sector, an immediate disconnect of the cargo hose would be required followed by immediate unmooring. This may require an emergency release of the hose and hawser from FPSO to enable the Static Tow Boat to pull the OT clear of the FPSO stern to avoid a potential collision or contact with FPSO offloading hose manifold located at stern.

“Vessel” means every description of water craft, including non-displacement craft, used or capable of being used as means of transportation on water.

“VPQ” Vessel Particulars Questionnaire – the latest version of OCIMF SIRE Programme format.

“WHP” “Well Head Platform” means the four (4) leg platform located in SSW of FPSO at a distance of 1.143n.m.

“WGS84” The World Geodetic System (Revision 1984) - a standard coordinate frame for the Earth.
4 RIGHT TO SUSPEND OPERATIONS

At all times, POVO will endeavour to ensure that vessels using the Terminal will not suffer, nor cause, damage. POVO reserves the right to suspend operations and require the removal of any vessel from the Terminal as follows:

a. for a breach of, or default under, these Terminal Regulations;

b. for defects in the vessel, its equipment, manning or operations which, in the reasonable opinion of POVO, present a hazard to the Terminal, personnel or the environment;

c. where, in the reasonable opinion of POVO, operational performance of a vessel fails to satisfactorily utilize the available Terminal facilities and thereby constitutes an unacceptable constraint on Terminal operations;

d. where, in the reasonable opinion of POVO, safety to the Terminal personnel, facility or operation is an issue; or

e. where, in the reasonable opinion of POVO, weather conditions impair or may impair the safe conduct of operations.
5 GENERAL DESCRIPTION OF THE LOCATION AND THE OFFSHORE INSTALLATIONS

5.1 LOCATION AND LAYOUT

The Terminal is located in Block 12W offshore Vietnam – about 160 n.m south east of Vung Tau. Its exact location is 07° 20’ 39.96”N, 108° 18’43.23”E.

Mariners are referred to Admiralty Chart No 3482.

Figure 1: Block 12W location

The Terminal acts as offloading terminal for crude oil produced at the Chim Sao and Dua oil fields offshore Vietnam.

The main Field facilities are comprised of the following:

- a floating production storage and offloading facility;
- a well head platform;
• Dua subsea well heads
• FPSO - Dua subsea well heads pipelines
• FPSO - WHP infield pipelines; and
• Gas Offtake pipeline running from FPSO to connect to the Nam Con Son Pipeline system

The Field facilities are located at the following co-ordinates (In WGS 84):

- WHP 07° 19’ 57.18" N 108° 17’ 49.05" E
- FPSO 07° 20’ 39.96" N 108° 18’ 43.23" E.
- Dua subsea 7° 27’ 23.16" N 108° 24’ 54.77" E

Figure 2: Chim Sao & Dua Field Layout

5.2 TERMINAL LIMITS

Terminal limits are defined by areas within the 2 circles of radius of 2 n.m with the center at the WHP and FPSO coordinates above.

5.3 CHIM SAO CRUDE OIL SPECIFICATIONS
5.3.1 Basic Crude Oil Properties Data

For more representative crude quality guidelines please refer to the latest available Pre-production Crude Oil Assay in the Appendix I in Section 17.

THE CRUDE OIL REQUIRES HEATING DURING TRANSPORTATION!

5.3.2 Brief information about behaviour of Waxy Crude Oil

General

The wax present in petroleum crudes primarily consists of paraffin hydrocarbons (C18 - C36) known as paraffin wax and naphthenic hydrocarbons (C30 - C60). Hydrocarbon components of wax can exist in various states of matter (gas, liquid or solid) depending on their temperature and pressure. When the wax freezes it forms crystals. The crystals formed are known as macrocrystalline wax. Those formed from naphthenes are known as microcrystalline wax.

![Figure 3. Macrocrystalline, Microcrystalline, and Crystal Deposit Network of Wax](image)

Waxy crude usually consists of:

- A variety of light and intermediate hydrocarbons (paraffins, aromatics, naphthenic, etc.).
- Wax as defined above.
- A variety of other heavy organic (non-hydrocarbon) compounds, even though at very low concentrations including resins, asphaltenes, diamondoids, mercaptans, organo-metallics, etc.

*When the temperature of a waxy crude oil is lowered, first the heavier fractions of its wax content start to freeze out. For waxy crude it is customary to measure its cloud point and pour point according to ASTM methods.*

Wax Deposition

**Waxy Crude:** is defined as a crude oil in which hydrocarbons and wax exist as its only heavy organic constituent. As the clean waxy crude flows through a cold pipe or conduit (with a wall temperature below the Cloud Point of the crude) crystals of wax may be formed on the wall. Wax crystals then grow in size until the whole inner wall is covered with the possibility of encapsulating oil inside the wax layers. As the wax thickness increases, pressure drop across the pipe needs to be increased to maintain a constant flow rate. As a result, the power requirement for the crude transport will increase. The arterial blockage problems of clean waxy crude can be efficiently controlled by insulation and heating of the pipe to a temperature above its cloud point.
5.4 FIELD FACILITY DESCRIPTIONS

5.4.1 FPSO

5.4.1.1 FPSO particulars:

The Terminal consists of the FPSO Emas Lewek, with the major particulars as follows:

<table>
<thead>
<tr>
<th>IMO number</th>
<th>7506039</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name of ship</td>
<td>Lewek Emas</td>
</tr>
<tr>
<td>Call Sign</td>
<td>9V8904</td>
</tr>
<tr>
<td>Flag</td>
<td>Singapore</td>
</tr>
<tr>
<td>MMSI</td>
<td>564 070 000</td>
</tr>
<tr>
<td>Gross tonnage</td>
<td>94647</td>
</tr>
<tr>
<td>Summer Load line Displacement</td>
<td>211,214</td>
</tr>
<tr>
<td>DWT</td>
<td>172,132</td>
</tr>
<tr>
<td>Cargo tank capacity excl. Slops</td>
<td>683,024 bbls</td>
</tr>
<tr>
<td>Length overall</td>
<td>290.37m</td>
</tr>
<tr>
<td>Breadth moulded</td>
<td>50.59m</td>
</tr>
<tr>
<td>Depth moulded</td>
<td>23.77m</td>
</tr>
</tbody>
</table>

5.4.1.2 FPSO Mooring spread

The FPSO is (Weather vane) moored to the sea floor by the turret mooring system which consists of nine lines of chain in a 3 x 3 arrangement. The line makeup is 800m of 114mm R4 Studless chain and ended at the piles.

Design Values of this mooring system are as follows:

- 1 min. wind 10m above sea level: 25.8 m/s (100 year)
- 100 yr sea-surface current (At 18.5 m water depth) 1.9 m/s
- Significant directional wave height: 7.9 m
- Mean zero-crossing period: 11.9 s
Figure 4: FPSO Mooring spread

Production from the WHP is routed via infield pipelines connected to the FPSO. Offtake Tankers will be moored in tandem bow to stern, and loaded by means of a floating hose from the stern of the FPSO to the portside midship manifold of the Offtake Tanker. A Static Tow vessel will hold an attached Offtake Tanker in a safe offtake sector off the stern of the FPSO.

**FPSO mooring spread is designed to safely withstand the following combined environmental conditions for tandem offtake:**

1. *Offtake Tanker DWT:* 150,000 MT
2. *1- min mean wind speed:* 11.4 m/s
3. *Hs:* 3.0m with *Ts* 7.7 sec
4. *Surface Current:* 1.0 m/s
5. *Direction of wind, wave, current, FPSO heading are in the most unfavorable values tandem hawser tension is expected to reach 269 T when FPSO is in light condition and offtake Tanker is fully loaded

### 5.4.1.3 Cargo size

The amount of crude oil available for a single lifting to an Offtake Tanker is approximately 150,000 – 525,000 barrels but during NE monsoon season (From Nov. 1 until April 1), the minimum acceptable cargo size is 200,000 bbls. The standard cargo size is 300,000 bbls

### 5.4.1.4 Tandem Mooring Equipment

The FPSO is equipped with remote and locally operated quick release 200 tonne safe working load ("SWL") mooring hook, which is fitted with load-monitoring cells.

5.4.1.5 Deck crane/Stores Delivery

Due to the remote location of the Chim Sao oilfield, there is no store supply. Personnel transfer from the FPSO to the field support boat and vice versa is carried out by using basket transfer with the deck crane.

5.4.1.6 Cargo hose

The FPSO is equipped with a 16" OCIMF marine hose standard.

- Rated Working Pressure: 15 barg (maximum)
- Proof Pressure: 22.5 barg
- Operating Pressure Range: -0.85 to 15 barg
- Allowable Oil Temperature: 20° C to 80° C
- Maximum Flow Velocity: 21 m/sec

The Tanker Rail Hose is connected to the Offtake Tanker manifold using camlock coupling and backup with bolt and nuts. Mating flange shall meet all specifications of an ANSI 150# flange with rated pressure of 15 bars.

5.4.1.7 Emergency release devices

In case of an emergency on the FPSO or the Offtake Tanker, there is a requirement for emergency cast off of the Offtake Tanker from FPSO. To achieve this, the FPSO is equipped with:

- **Mooring Hawser Quick Release Hook**
  - Function: for emergency release of tandem mooring hawser on FPSO side
  - QRH is installed on the FPSO poopdeck
  - SWL: 200T
  - Load Monitoring: Visual Local and Remote Load Monitoring in CCR.
  - Alarms: high and low load audible and visual alarms;
    - low (5T) - warning of slack hawser,
    - high (100T) - 1st trigger load for cast off decision and
    - high-high (120T) - trigger for immediate stop of pumping, hose disconnection and cast off loads
  - Release Points: Local and remote release points in CCR.

- **Marine Breakaway Coupling**

A special safety device namely a Double Closure Marine Breakaway Coupling is installed between the hose sections 3 and 4 from the tanker end.

- Function: When excessive axial strain, overpressure or hydraulic shock is applied to the hose string during hose handling or during cargo transfer, the MBC will break in half. Self closing devices on each side of the break will prevent oil spilling out of the hose on either side of the coupling.
- Type: Double Closure (Seal at both parting sides)
- Nominal Bore: 16"
- Design pressure: 275 P.S.I.G
- Design Parting Load: 35T
- Design Closure Time: 4 secs
5.4.1.8 Metering system

The Fiscal Metering Skid consists of three 16" Meter Runs with 12" Faure Herman turbine meters of 2500 m³/hr for each meter run. A 30" Bi-directional Pipe Prover is provided for meter proving during offloading. The metering system is equipped with a Fast Loop System consisting of automatic sampler, sampler panel, BS&W analyzer and densitometer at the header section. In normal operation, two (2) meter runs are operating to achieve the required continuous 5,000m³/hr maximum flow while the remaining meter run remains as a spare. This spare meter run can be put into service if one of the operating meter runs should suffer a failure.

5.4.2 WHP

The WHP is a signal yellow color, four-legged jacket configuration having top work point leg spacing dimensions of 12.192 m (40 feet) x 18.288 m (60 feet) supporting the topsides. The elevation for the Chim Sao platform is 29.5m above the Chart Datum (L.A.T – Lowest Astronomical Tide).

5.4.3 Dua tie-back

The Dua pipelines extend from PLEM 3 at the FPSO to the Twin Pipeline Active Manifold (TPAM) located in the Dua field some 17km away. A power, chemical and hydraulic umbilical also runs from the FPSO to the TPAM. The two pipelines are looped at the TPAM to provide a round trip piggable system, one pipeline is used for transporting Oil from the TPAM to the FPSO, the other pipeline is for Pigging mainly with water and for Gas lift as and when it is needed.

There are three Dua production wells which delivery oil from the Dua field to the Xmas Trees located in the Multi-Well Production Guide Base (MWPGB). There is provision for four Xmas Trees.

The Dua crude is extremely waxy with a WAT of approx. 80 Deg C. To prevent the wax gelling in the pipeline the line has been heavily insulated. The Buckle Trigger structures have been installed roughly equidistant along the pipeline to mitigate against the uncontrolled lateral buckling which could result in damage to the pipeline. The crude is transported to the FPSO via PLEM 3 for processing and shipping. PLEM 3 also includes provision for future expansion by means of a production Wye in the production line for tie-in of future fields.

5.4.4 Gas Export Pipeline

The gas Export pipeline will export sales quality gas from the FPSO to PetroVietnam’s Nam Con Son Pipeline where it will be transported to the onshore facilities at Dinh Co Terminal for sale. The 10" pipeline is approximately 95.6km long.

5.4.5 Infield pipelines

There are four subsea pipelines and an umbilical running between the FPSO and the WHP.

5.4.6 Infield Fire Fighting Equipment

Each POVO Field Support Vessel is capable of providing water/foam through two monitors at up to 2400m³/h (Or 10,560 GPM) per vessel.
5.4.7 The Safety Zone
An area within a radius of five hundred (500) meters from WHP and FPSO and any fixed surface facilities. No unauthorized vessels are allowed to enter this zone. All offshore support vessels engaged in oilfield operations should seek permission from the OIM before entering this zone.

5.4.8 The Marine Exclusion Zone,
An area within a radius of two (2) nautical miles surrounding the WHP and the FPSO. No unauthorized vessels are allowed to enter this zone.

5.4.9 No Anchoring & No Fishing Zones
Area of 2 n.m extending to either side of the subsea pipelines and Dua subsea wellheads are "No Fishing & No Anchoring" zones.

5.4.10 Vessel waiting anchorage and Pilot Boarding Ground
A circle with radius of 0.5 n.m and center at the coordinates:

\[
07^\circ 21'29.27" \text{ N} \quad 108^\circ 17'38.56" \text{ E}
\]

The seafloor within the site is essentially flat. There is no major bathymetric anomaly observed within the Chim Sao oilfield and the location is situated on a flat sandy area. Superficial sediment within the site is expected to comprise of loose SAND with traces of shell fragments. Anchor holding capacity is expected to be poor to moderate in the sandy area.

Water depth at this area is 96.2m MSL

*Alternative Boarding Ground* in case of bad weather: see the subsection 5.4.19
Figure 5: Chim Sao & Dua Safety, Designated and No Anchor/Fishing Zones
5.4.11 Nautical Charts

British Admiralty Chart number 3482.
International Chart 550
5.4.12 Navigational Aids

Both the FPSO and the WHP are provided with navigation aids with specification in full compliance with IALA (International Association of Lighthouse Authorities) recommendations for offshore installation.

On WHP
- Navigation Lights: 02 white lights with a minimum effective intensity of 1400 candelas. The lights shall be operated in unison with a flashing character according to Morse letter « U » (· · -) and with a maximum period of 15 seconds.
- The Fog Horn with a range of at least 2 nautical miles. The character shall be rhythmic blasts corresponding to Morse letter « U » every 30 seconds.

On FPSO
- Navigation Lights: 02 white lights; range: 10 miles, flash: signal Morse code “U” with a maximum period of 15 seconds
- The Fog Horn with a range of at least 2 nautical miles. The character shall be rhythmic blasts corresponding to Morse letter « U » every 30 seconds.
- RACON (Radar Beacon) Morse Code “U” is installed on FPSO

5.4.13 Local Time

Chim Sao terminal uses Vietnam Standard Time Zone which is 7 hours ahead of Greenwich Mean Time ("GMT").

5.4.14 Terminal Charge

A nominal charge for services supplied by the Terminal shall be made by POVO for:
- tanker vetting cost
- tug boat for berthing,
- hose handling,
- Mooring Master service,
- air transportation,
- infield boat transfer,

This charge is currently US$ 35, 000.00 per lifting.
Other Port charges will be notified directly to the Offtake Tanker Owners or Charterers by their Shipping Agents

5.4.15 Terminal Working Hours

- Berthing hours

Conditions permitting, the Terminal will operate twenty-four (24) hours a day, seven (7) days a week. Berthing operation is not allowed to be conducted from 17:00hrs until 06:00 hrs. Therefore a Tanker will normally be allowed to berth if she passes the pre-berthing safety inspection by 15:00 LT.

- Unmooring hours

Unmooring will be carried out at any hour, weather and other circumstances permitting.
5.4.16 Limiting conditions for berthing and cargo transfer operations

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Approach &amp; Berthing Limits</th>
<th>Limits During Offtake</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Take Action If</td>
<td>Action to take</td>
</tr>
<tr>
<td>Wind Speed</td>
<td>&gt;30 knots</td>
<td>MM &amp; Tanker Master to delay berthing, unless both agree safe to berth on joint evaluation of current &amp; forecasted weather</td>
</tr>
<tr>
<td></td>
<td>&gt;35 knots</td>
<td>Stop pumping &amp; disconnect hose then unberth unless MM &amp; Tanker Master both agree safe to continue on joint evaluation of current &amp; forecasted weather.</td>
</tr>
<tr>
<td>$H_s$</td>
<td>&gt;3.5 m</td>
<td>&gt;4.5m</td>
</tr>
<tr>
<td>$H_{max}$</td>
<td>&gt; 5.0 m</td>
<td>&gt; 5.5m</td>
</tr>
<tr>
<td>Visibility</td>
<td>&lt;1,000 m</td>
<td>No visual contact</td>
</tr>
<tr>
<td>Electrical storm</td>
<td>NA</td>
<td>Loading operations shall be stopped. All cargo valves and all vent and inert gas (“IG”) valves shall be closed on the offtake tanker.</td>
</tr>
<tr>
<td>Hawser Tension</td>
<td>NA</td>
<td>&gt;100T once</td>
</tr>
<tr>
<td></td>
<td>&gt;100T twice in 30 minutes</td>
<td>Stop pumping and MM &amp; Tanker Master evaluate whether to disconnect</td>
</tr>
<tr>
<td></td>
<td>&gt;120T once</td>
<td>Stop pumping &amp; disconnect hose then unberth</td>
</tr>
<tr>
<td>Tanker Heading/position or/and hawser angle</td>
<td>Outside safe berthing sector</td>
<td>Inside the Alert Offtake sector</td>
</tr>
<tr>
<td></td>
<td>MM &amp; Tanker Master to delay berthing</td>
<td>1/ FPSO CCR, Tanker CCR and Mooring Master to be advised. 2/ Stop Cargo transfer. 3/Tanker engine to be ready to be used to regain safe position 4/ 2nd Support Vessel to come to OT starboard side forward to push or tow using OT emergency Fire Wire as directed by Mooring Master. 5/ FPSO and OT ready for hose content displacement with slop water or nitrogen blow. 6/ OT crew is ready for hose disconnect and cast off</td>
</tr>
</tbody>
</table>
7/ FPSO Quick Release Hook (QRH) is ready for emergency cast off

inside the Unsafe Offtake sector

1/ Immediate disconnect of the hose followed by immediate unmooring.
2/ Activate FPSO QRH then Marine Breakaway Coupling if required to avoid imminent collision with FPSO or contact with the Stern Offloading Hose manifold.

Notes:

- **“Safe Berthing Sector”:** A sector of 15° on either side of FPSO centerline
- **“Safe Offtake Sector”:** A sector of 30° on either side of FPSO centerline
- **“Alert Offtake Sector”:** A sector of 30° - 45° on either side of FPSO centerline
- **Unsafe Offtake Sector”:** A sector beyond 45° either side of the FPSO centerline
- The above criterion does not relieve the ship or Terminal from their obligation to use their best judgment when assessing the suitability of conditions for loading.
- This criterion is applicable for the Export tanker size normally accepted for loading at the terminal, i.e. 80,000 – 120,000DWT. Please refer to 7.2.2
- **When using the tanker engine to regain alignment, cargo transfer must be stopped**
- In order to prevent hydraulic surge in the crude oil transfer line on board the FPSO in case of emergency stop, the closing time for the ESDV is 40 seconds.
Figure 6: Offtake safe and Alert (standby) sectors
Figure 7: Monitoring the tanker position during offtake and “call CCR” situations
5.4.17 Limiting conditions for hose transfer to tanker manifold and infield personnel transfer to/from tanker

<table>
<thead>
<tr>
<th>CRITERIA</th>
<th>ACTIVITIES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hose transfer to tanker manifold by boat</td>
<td>Boatless hose transfer to tanker manifold</td>
</tr>
<tr>
<td>Mean Wind speed at 10m level</td>
<td>&lt;20 kts</td>
</tr>
<tr>
<td>Significant Wave Height</td>
<td>&lt;1.5 m</td>
</tr>
<tr>
<td>Surface current</td>
<td>&lt; 1.5 knots</td>
</tr>
</tbody>
</table>

5.4.18 Personnel transfer at night

In principle, no personnel transfer is allowed at night time. Personnel transfer during darkness is subject to joint agreement of Mooring Master, Offtake Tanker Master, and Offtake Support Vessel Master with final approval by the OIM.

5.4.19 Alternative Tanker Boarding Ground

Limiting criteria for personnel transfer is more stringent than criteria for Offtake Tanker berthing, to avoid prolong waiting for weather to calm down below the limiting criteria for infield personnel transfer by boat, in benefit of Tanker operator/owner as well as of buyer, the Offtake Tanker may be requested to proceed to Vung Tau Bad Weather Tanker Boarding Ground in position: 10°15’N 107°05’E (4 n.m south of Mui Vung tau point ) or other alternative boarding ground which is safer and closer to the Terminal than Vung Tau is. Time, cost and risk to be to crude oil buyer’s/charterer’s/shipowner’s account.

5.4.20 Terminal Closed

The Terminal will be closed when weather or other conditions make it unsafe for either berthing or remaining moored to the Terminal. A Notice of Readiness will not be accepted during periods when the Terminal is closed. All decisions regarding the opening and closing of the Terminal are at the discretion of the Terminal Operator. If the Terminal is closed the Offtake Tanker Master will be given written notice of the estimated time and duration of the closure.

The Terminal Operator reserves the right to refuse to berth a specific Offtake Tanker if the conditions of its facilities are unsafe for berthing or loading, even though the berth may be open to other Offtake Tankers. Various combinations of wind, sea and tidal conditions in combination with the size, length, ballasted trim and handling characteristics of an Offtake Tanker can affect the decision to berth at the Terminal. All these factors will be evaluated before a final berthing decision is made. In the event an Offtake Tanker is rejected for any of the aforesaid reasons the Terminal will supply the Offtake Tanker Owner with written reasons for non-acceptance.
The decision of the Terminal Operator to permit an Offtake Tanker to berth shall be final. On receipt of such permission, berthing will be at the discretion of the OIM in agreement with the Mooring Master and the Offtake Tanker Master.
6 ENVIRONMENTAL CONDITIONS

6.1 WEATHER PATTERN

6.1.1 Winter - the Northeast Monsoon Season

In Block 12W the northeast monsoon wind becomes established in the beginning of November or second half of October. During this period the wind direction over the open sea is predominantly north easterly and the average force, when fully evolved, is about force 5 - 6.

As the NE monsoon comes from the north, the wave and current pattern are established earlier than the wind pattern.

The winds tend to blow in successive pulsations, periods of comparatively fresh wind followed by periods when the wind is less strong. At times the wind freshens to force 7 or 8, while at others times it does not exceed force 4.

December and January are the worst months for number of occurrences exceeding arbitrary thresholds of 4m significant wave height and 12m/s wind speed.

6.1.2 Summer - the Southwest Monsoon Season

From approximately June to September, winds are predominantly south-westerly mainly force 4 or 5 but occasionally reaching force 6.

During October the winds become variable before the onset of the north-east monsoon.

Although during the summer monsoon steady wind speeds of force 6 are rare, squalls are fairly common, during which gale force winds may be temporarily experienced.
### Table: Monthly wind speed statistics – m/s

<table>
<thead>
<tr>
<th>MONTH</th>
<th>MIN</th>
<th>MEAN</th>
<th>MAX</th>
<th>MAIN DIRECTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>January</td>
<td>1.2</td>
<td>9.8</td>
<td>17.5</td>
<td>NE</td>
</tr>
<tr>
<td>February</td>
<td>0.5</td>
<td>8.2</td>
<td>17.5</td>
<td>NE</td>
</tr>
<tr>
<td>March</td>
<td>0.2</td>
<td>6.6</td>
<td>17.7</td>
<td>NE</td>
</tr>
<tr>
<td>April</td>
<td>0.2</td>
<td>5.0</td>
<td>13.8</td>
<td>E</td>
</tr>
<tr>
<td>May</td>
<td>0.3</td>
<td>4.2</td>
<td>13.5</td>
<td>SW</td>
</tr>
<tr>
<td>June</td>
<td>0.2</td>
<td>6.1</td>
<td>12.9</td>
<td>SW</td>
</tr>
<tr>
<td>July</td>
<td>0.4</td>
<td>6.8</td>
<td>14.6</td>
<td>SW</td>
</tr>
<tr>
<td>August</td>
<td>0.4</td>
<td>7.6</td>
<td>15.6</td>
<td>SW</td>
</tr>
<tr>
<td>September</td>
<td>0.2</td>
<td>6.2</td>
<td>14.3</td>
<td>SW</td>
</tr>
<tr>
<td>October</td>
<td>0.4</td>
<td>4.7</td>
<td>14.2</td>
<td>NE W</td>
</tr>
<tr>
<td>November</td>
<td>0.6</td>
<td>7.0</td>
<td>17.6</td>
<td>NE</td>
</tr>
<tr>
<td>December</td>
<td>1.1</td>
<td>9.7</td>
<td>18.1</td>
<td>NE</td>
</tr>
<tr>
<td>All Year</td>
<td>0.2</td>
<td>6.8</td>
<td>18.1</td>
<td>NE</td>
</tr>
</tbody>
</table>

### Table: Monthly Significant wave height statistics

<table>
<thead>
<tr>
<th>MONTH</th>
<th>MIN (m)</th>
<th>MEAN (m)</th>
<th>MAX (m)</th>
<th>MAIN DIRECTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>January</td>
<td>0.27</td>
<td>2.39</td>
<td>5.79</td>
<td>NE</td>
</tr>
<tr>
<td>February</td>
<td>0.45</td>
<td>1.90</td>
<td>5.75</td>
<td>NE</td>
</tr>
<tr>
<td>March</td>
<td>0.33</td>
<td>1.46</td>
<td>6.32</td>
<td>NE</td>
</tr>
<tr>
<td>April</td>
<td>0.30</td>
<td>1.04</td>
<td>3.77</td>
<td>NE</td>
</tr>
<tr>
<td>May</td>
<td>0.31</td>
<td>0.75</td>
<td>2.94</td>
<td>NE SW</td>
</tr>
<tr>
<td>June</td>
<td>0.26</td>
<td>0.94</td>
<td>2.62</td>
<td>SW</td>
</tr>
<tr>
<td>July</td>
<td>0.24</td>
<td>1.09</td>
<td>3.17</td>
<td>SW</td>
</tr>
<tr>
<td>August</td>
<td>0.23</td>
<td>1.26</td>
<td>4.08</td>
<td>SW</td>
</tr>
<tr>
<td>September</td>
<td>0.29</td>
<td>1.09</td>
<td>3.55</td>
<td>SW</td>
</tr>
<tr>
<td>October</td>
<td>0.34</td>
<td>1.18</td>
<td>3.87</td>
<td>NE</td>
</tr>
<tr>
<td>November</td>
<td>0.58</td>
<td>1.82</td>
<td>5.59</td>
<td>NE</td>
</tr>
<tr>
<td>December</td>
<td>0.60</td>
<td>2.54</td>
<td>6.79</td>
<td>NE</td>
</tr>
<tr>
<td>All Year</td>
<td>0.23</td>
<td>1.45</td>
<td>6.79</td>
<td>NE</td>
</tr>
</tbody>
</table>

*Yearly statistics of significant wave height and direction*
6.2 CURRENTS

The surface currents at Block 12W are wind generated. Currents therefore will be in the direction of the prevailing monsoon. These currents will generally exceed one knot and on occasions exceed two knots. Extreme currents may be generated during the summer months due to typhoon related events. Strong currents are also generated during the NE monsoon periods if winds are persistently strong.

<table>
<thead>
<tr>
<th>MONTH</th>
<th>MIN</th>
<th>MEAN</th>
<th>MAX</th>
<th>MAIN DIRECTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>January</td>
<td>4</td>
<td>49</td>
<td>111</td>
<td>SW</td>
</tr>
<tr>
<td>February</td>
<td>1</td>
<td>39</td>
<td>90</td>
<td>SW</td>
</tr>
<tr>
<td>March</td>
<td>0</td>
<td>28</td>
<td>86</td>
<td>SW</td>
</tr>
<tr>
<td>April</td>
<td>0</td>
<td>23</td>
<td>56</td>
<td>W</td>
</tr>
<tr>
<td>May</td>
<td>0</td>
<td>23</td>
<td>76</td>
<td>E W NW</td>
</tr>
<tr>
<td>June</td>
<td>0</td>
<td>23</td>
<td>77</td>
<td>NE E</td>
</tr>
<tr>
<td>July</td>
<td>0</td>
<td>25</td>
<td>79</td>
<td>N NE</td>
</tr>
<tr>
<td>August</td>
<td>0</td>
<td>27</td>
<td>68</td>
<td>N NE</td>
</tr>
</tbody>
</table>

Table: Monthly near-surface current (at 0.9m below surface)-cm/sec
### Monthly near – seabed current speed (cm/sec)

<table>
<thead>
<tr>
<th>MONTH</th>
<th>MIN</th>
<th>MEAN</th>
<th>MAX</th>
<th>MAIN DIRECTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>January</td>
<td>0</td>
<td>27</td>
<td>72</td>
<td>S</td>
</tr>
<tr>
<td>February</td>
<td>0</td>
<td>20</td>
<td>64</td>
<td>S SW</td>
</tr>
<tr>
<td>March</td>
<td>0</td>
<td>13</td>
<td>41</td>
<td>SW</td>
</tr>
<tr>
<td>April</td>
<td>0</td>
<td>12</td>
<td>37</td>
<td>E W</td>
</tr>
<tr>
<td>May</td>
<td>0</td>
<td>13</td>
<td>41</td>
<td>W</td>
</tr>
<tr>
<td>June</td>
<td>0</td>
<td>15</td>
<td>44</td>
<td>W</td>
</tr>
<tr>
<td>July</td>
<td>0</td>
<td>15</td>
<td>46</td>
<td>NE W NW</td>
</tr>
<tr>
<td>August</td>
<td>0</td>
<td>15</td>
<td>41</td>
<td>NW</td>
</tr>
<tr>
<td>September</td>
<td>0</td>
<td>13</td>
<td>33</td>
<td>W NW</td>
</tr>
<tr>
<td>October</td>
<td>0</td>
<td>13</td>
<td>40</td>
<td>W</td>
</tr>
<tr>
<td>November</td>
<td>0</td>
<td>21</td>
<td>61</td>
<td>SW</td>
</tr>
<tr>
<td>December</td>
<td>1</td>
<td>33</td>
<td>73</td>
<td>S</td>
</tr>
<tr>
<td>All Year</td>
<td>0</td>
<td>27</td>
<td>72</td>
<td>E S SW W</td>
</tr>
</tbody>
</table>

### Table: Monthly mid-depth current (at 41.5 m water depth)-cm/sec

<table>
<thead>
<tr>
<th>MONTH</th>
<th>MIN</th>
<th>MEAN</th>
<th>MAX</th>
<th>MAIN DIRECTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>January</td>
<td>0</td>
<td>44</td>
<td>98</td>
<td>S</td>
</tr>
<tr>
<td>February</td>
<td>0</td>
<td>35</td>
<td>77</td>
<td>S</td>
</tr>
<tr>
<td>March</td>
<td>0</td>
<td>26</td>
<td>79</td>
<td>S SW</td>
</tr>
<tr>
<td>April</td>
<td>0</td>
<td>18</td>
<td>48</td>
<td>SW W</td>
</tr>
<tr>
<td>May</td>
<td>0</td>
<td>20</td>
<td>56</td>
<td>W</td>
</tr>
<tr>
<td>June</td>
<td>0</td>
<td>23</td>
<td>69</td>
<td>N NE W NW</td>
</tr>
<tr>
<td>July</td>
<td>1</td>
<td>26</td>
<td>79</td>
<td>NW</td>
</tr>
<tr>
<td>August</td>
<td>1</td>
<td>26</td>
<td>57</td>
<td>N NW</td>
</tr>
<tr>
<td>September</td>
<td>1</td>
<td>23</td>
<td>56</td>
<td>N NW</td>
</tr>
<tr>
<td>October</td>
<td>0</td>
<td>21</td>
<td>60</td>
<td>N NW</td>
</tr>
<tr>
<td>November</td>
<td>0</td>
<td>40</td>
<td>95</td>
<td>S</td>
</tr>
<tr>
<td>December</td>
<td>4</td>
<td>54</td>
<td>113</td>
<td>S</td>
</tr>
<tr>
<td>All Year</td>
<td>0</td>
<td>44</td>
<td>98</td>
<td>S</td>
</tr>
</tbody>
</table>
6.3 **TYPHOONS**

Tropical cyclones occur more frequently further north within the East Sea (Vietnamese: Bien Dong). The Block 12W area can be affected by these typhoons but is unlikely to receive a direct hit by typhoons. High frequency of typhoons is expected in late July – Oct. A large tropical cyclone tracked close to the site in December 1972.

6.4 **TIDE**

<table>
<thead>
<tr>
<th>Tidal Level</th>
<th>Height (m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Highest Astronomic Tide - HAT</td>
<td>2.14</td>
</tr>
<tr>
<td>Indian High Water Springs - IHWS</td>
<td>2.12</td>
</tr>
<tr>
<td>Mean Tidal Level - MTL</td>
<td>1.20</td>
</tr>
<tr>
<td>Indian Low Water Springs – ILWS</td>
<td>0.28</td>
</tr>
<tr>
<td>Lowest Astronomic Tide - LAT</td>
<td>0.00</td>
</tr>
</tbody>
</table>

6.5 **AIR TEMPERATURE**

Air temperature data are not available for the offshore locations at Block 12W. However, data for Vung Tau station on the coast are generally for reference and are presented in the Table below.

<table>
<thead>
<tr>
<th></th>
<th>Jan</th>
<th>Feb</th>
<th>Mar</th>
<th>Apr</th>
<th>May</th>
<th>Jun</th>
<th>Jul</th>
<th>Aug</th>
<th>Sep</th>
<th>Oct</th>
<th>Nov</th>
<th>Dec</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abs Max Temp(C)</td>
<td>34.4</td>
<td>33.9</td>
<td>35.6</td>
<td>35.6</td>
<td>37.2</td>
<td>37.8</td>
<td>36.1</td>
<td>36.1</td>
<td>36.1</td>
<td>34.4</td>
<td>33.9</td>
<td>34.4</td>
<td>37.8</td>
</tr>
<tr>
<td>Mean Max Temp(C)</td>
<td>29.4</td>
<td>29.4</td>
<td>30.0</td>
<td>31.1</td>
<td>31.7</td>
<td>32.2</td>
<td>31.1</td>
<td>31.7</td>
<td>31.1</td>
<td>30.6</td>
<td>30.6</td>
<td>29.4</td>
<td>30.6</td>
</tr>
<tr>
<td>Mean Min Temp(C)</td>
<td>20.0</td>
<td>20.6</td>
<td>22.8</td>
<td>24.4</td>
<td>25.0</td>
<td>24.4</td>
<td>23.9</td>
<td>24.4</td>
<td>23.9</td>
<td>23.3</td>
<td>22.8</td>
<td>20.6</td>
<td>23.0</td>
</tr>
<tr>
<td>Abs Min Temp(C)</td>
<td>14.4</td>
<td>16.1</td>
<td>17.2</td>
<td>20.0</td>
<td>22.2</td>
<td>21.7</td>
<td>20.6</td>
<td>17.8</td>
<td>22.2</td>
<td>20.6</td>
<td>17.8</td>
<td>12.2</td>
<td>12.2</td>
</tr>
</tbody>
</table>

6.6 **SEA TEMPERATURE**

<table>
<thead>
<tr>
<th>Month</th>
<th>Minimum (°C)</th>
<th>Maximum (°C)</th>
<th>Mean (°C)</th>
</tr>
</thead>
<tbody>
<tr>
<td>January</td>
<td>21.0</td>
<td>31.2</td>
<td>25.6</td>
</tr>
<tr>
<td>February</td>
<td>21.0</td>
<td>31.8</td>
<td>26.0</td>
</tr>
<tr>
<td>March</td>
<td>22.0</td>
<td>32.4</td>
<td>27.0</td>
</tr>
</tbody>
</table>
### Table: Statistics of Surface Seawater Temperature (°C)

Sea temperature data for the area generally, on an annual basis, is presented in Table below. The source is the US Climate Centre (NODC) CD-ROM of global sea temperatures. The area covered is from 7° to 9° N and 108° to 110° E but the following table is for information.

<table>
<thead>
<tr>
<th>Depth(m)</th>
<th>Mean</th>
<th>Maximum</th>
<th>Minimum</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>27.93</td>
<td>31.60</td>
<td>17.00</td>
</tr>
<tr>
<td>10</td>
<td>27.68</td>
<td>31.50</td>
<td>24.00</td>
</tr>
<tr>
<td>20</td>
<td>27.50</td>
<td>31.50</td>
<td>23.00</td>
</tr>
<tr>
<td>30</td>
<td>27.17</td>
<td>31.30</td>
<td>22.17</td>
</tr>
<tr>
<td>40</td>
<td>27.01</td>
<td>31.10</td>
<td>21.70</td>
</tr>
<tr>
<td>50</td>
<td>26.01</td>
<td>30.00</td>
<td>20.61</td>
</tr>
<tr>
<td>60</td>
<td>25.49</td>
<td>29.60</td>
<td>19.39</td>
</tr>
<tr>
<td>70</td>
<td>24.39</td>
<td>29.12</td>
<td>18.30</td>
</tr>
<tr>
<td>80</td>
<td>23.28</td>
<td>28.40</td>
<td>18.39</td>
</tr>
<tr>
<td>90</td>
<td>22.11</td>
<td>28.28</td>
<td>17.00</td>
</tr>
<tr>
<td>100</td>
<td>21.49</td>
<td>27.95</td>
<td>15.30</td>
</tr>
<tr>
<td>120</td>
<td>19.66</td>
<td>24.83</td>
<td>16.72</td>
</tr>
</tbody>
</table>

**Table 14- Offshore Vietnam Sea Temperatures (°C) distribution by water depth**

### 6.7 HUMIDITY

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean Annual</td>
<td>80 – 85 %</td>
</tr>
<tr>
<td>Maximum Annual</td>
<td>95 %</td>
</tr>
<tr>
<td>Minimum Annual</td>
<td>60 %</td>
</tr>
</tbody>
</table>
6.8 FOG AND VISIBILITY
Fog is rare throughout the area however during rain squalls visibility can be extremely limited.

6.9 RAINFALL
Rainfall is most abundant from about May to October i.e. at the peak SW monsoon with thunderstorms and heavy rain squalls.
7  TANKER VETTING

7.1  POVO TANKER VETTING PROCESS

7.1.1  General

POVO has responsibility to ensure that Offtake Tankers are in fit condition to load oil in a
safe and responsible manner. All Offtake Tankers shall be vetted by POVO Ship Vetting or a
third party Ship Vetting Service as appointed by POVO for their suitability. This vetting is
performed in two stages:

- when an offtake tanker has been nominated to transport the Chim Sao oil
- when the offtake tanker arrives at the Facility to begin the offtake.

The Seller shall be responsible to inform the Buyer that POVO has in force a vetting
programme that all proposed offtake tankers will be subjected to, before final fixing to lift
crude oil at the Facility.

Information on ship quality is gathered from many sources including tanker inspections on
behalf of POVO, owner assessments, industry reports, terminal and operational feedback,
market intelligence, casualty data, reputation and questionnaires.

7.1.2  1st stage of vetting – Preliminary Assessment of Offtake Tanker on nomination:

**Tanker compatibility assessment**

Is based on valid Tanker Questionnaires (OCIMF VPQ and Q88 version 3) and submitted
Bow Mooring Arrangement plan. OCIMF standards are the basis for compatibility
assessment.

**Risk assessment**

Vessels shall be reviewed using the following information although other relevant sources of
data or documentation may be utilized:

- valid SIRE inspection report;
- physical inspection by qualified Surveyors acceptable to POVO;
- port state control reports;
- casualty and detention history; and
- Terminal operator’s feedback.
- databases of MOUs (Memorandum of Understanding), PSCs (Port State Controls),
  USCg (US Coast Guard), EQUASIS, etc.,
- The latest Key Position Qualification Matrix.
- TMSA ranking

POVO are responsible, if deemed necessary, for contracting professionally qualified
surveyors to determine the vessel’s compliance with internationally recognized standards
using the latest OCIMF – SIRE VIQ.

Within 24hrs of receiving the message of tanker nomination, POVO shall inform the Lifting
Party of acceptance/ rejection of the tanker.

7.1.2.1  Acceptance by POVO

Where POVO consider the tanker acceptable for an offtake at the Facility, the Seller, FPSO
OIM and the FPSO Marine Supervisor shall be notified.
7.1.2.2 Rejection By POVO
Where POVO considers that the nominated Tanker does not comply with the Acceptance Criteria then the tanker will be rejected with the reasons for rejection. This shall be notified to the Seller immediately by POVO.

Rejection may also be based on performance at the Facility on a previous visit.

7.1.3 2nd stage of vetting - Final Acceptance – Tanker arrives at the Terminal
Tankers are accepted at the terminal subject to the final inspection by the Mooring Master on arrival at the Terminal.

Mooring Master shall inspect the physical layout and equipment on the Offtake Tanker, Manifold, Forecastle Head, and Stern area for securing the static tow.

The Mooring Master shall also vet the Offtake Tanker whilst completing the Offtake Tanker Safety Checklist.

After consultation with POVO, the Mooring Master shall be the final arbiter in the acceptance or rejection of an Offtake Tanker at the terminal.

7.1.4 Rejection of the Offtake Tanker at the Terminal
When the Mooring Master rejects an Offtake Tanker at the Terminal, POVO’s HCMC Operations Superintendent will be notified immediately with the reasons for rejection. The POVO HCMC Operations Superintendent will then notify all interested parties immediately.

POVO contact details for Tanker vetting:
Email:  cphuong@premier-oil.com & vthuy@premier-oil.com
Phone:   (84)-8- 39105788   (Ext. 2513 & 2516)
Hand phone :   (84) 903 748822
Fax:       (84)-8- 39105799

7.2 TANKER ACCEPTANCE CRITERIA

7.2.1 General requirement
All Tankers calling at the Terminal must comply with all applicable International Maritime Organization (“IMO”) Conventions and recognized industry guidelines, including the latest edition of International Safety Guide for Oil Tankers and Terminals (“ISGOTT”).

All Tankers nominated for calling at the Terminal must be vetted and approved by POVO prior to being accepted at the Terminal. The Terminal does not have facilities to handle dirty ballast and, therefore, only tankers having segregated ballast tanks (“SBT”) will normally be accepted at the Terminal. Requests for acceptance of Tankers that do not have SBT will be reviewed on a case-by case basis. If accepted, these Tankers will be required to retain all ballast on board in cargo tanks.

Only clean ballast from SBT will be allowed to be discharged into the sea at the Terminal. Ballasted Tankers must arrive with sufficient ballast to meet the SBT requirements of IMO’s International Convention for the Prevention of Pollution from Ships (“MARPOL 73/78”) Annex I, Regulation 18 (2.) or any amendment to same.
All Tankers calling at Chim Sao terminal must be capable of closed loading and closed gauging.

In determining whether a Tanker will be approved for loading at the Terminal, the following acceptance criteria will be considered:

7.2.2 Vessel Particulars

The following guidelines govern Tanker acceptance:

- Tanker size of 80,000 – 120,000 DWT (Aframax Size) is normally acceptable.
- Tankers outside this range (less than 80,000 DWT or more than 120,000 DWT) may be considered on vessels’ individual merits and can be accepted at the sole discretion of the Terminal. The maximum tanker size acceptable at the terminal is 150,000 DWT.
- CBT tankers and tankers without a closed gauging system shall not be accepted. Combination carriers are not preferred, but can be utilized if:
  - Tanker is double hull or equivalent technology;
  - In ballast and void spaces, Tanker must be equipped with inert gas system and gas detection systems (either manual or permanent); and
  - The previous three (3) cargos must have been oil.
- Any combination carrier having operated in dry mode falls within the scope of combination carrier for the rest of its life.

7.2.3 Vessel Age

The following guidelines govern Vessel acceptance:

- Vessels up to fifteen (15) years may be accepted on the basis of a current SIRE report.
- Double-hull Tankers between fifteen (15) and twenty (20) years may be accepted on the basis of a current SIRE report. Note: SIRE inspection within last 6 month is considered as valid for vessel age of more than 15 years old.
- Tankers of more than fifteen (15) years of age must have passed the CAP conducted by Recognized Organizations. A current minimum CAP rating of two (2) is required for Vessel acceptance.
- Combination carriers over fifteen (15) years of age are not acceptable.
- Vessels over 20 years of age are not acceptable.
- The maximum period of validity of a CAP rating is three years from the last day of the CAP survey. CAP ratings and reports issued by Lloyd's Register, Det Norske Veritas, American Bureau of Shipping, Bureau Veritas, Nippon Kaiji Kyokai, Germanischer Lloyd, Registro Italiano Navale and Korean Register of Shipping are acceptable provided they include fatigue analysis.

7.2.4 Tanker Owner Information/TMSA/Tanker Performance History

The following guidelines govern Vessel acceptance:

- Owner or Operating (Technical and Safety) Managers are assessed through the OCIMF TMSA programme, which gives an overview assessment of the management system and the effectiveness of the vessel owner/operating manager. Offtake Tanker
Owners and operators may be audited to review and evaluate operating policy, personnel standards, safety policy, emergency response procedures and Vessel maintenance management.

- Where casualty or detention history documented by a port state authority results in a “targeted owner” or “targeted Vessel” or similar designation by that authority, this designation will be considered in the review process.

7.2.5 Classification Society

The following guidelines govern Tanker acceptance:

- A list of approved classification societies shall be maintained by the Operations Superintendent.
- Enhanced special survey results may be reviewed for applicable Tankers over five (5) years of age.

7.2.6 Insurance

The following guidelines govern Vessel acceptance:

Vessels shall be insured with a member of the International Group of P & I Clubs.

There are thirteen separate and independent principal Clubs in the Group as follows:

1. American Steamship Owners Mutual Protection and Indemnity Association, Inc.
2. Assuranceforeningen Skuld
3. Gard P&I (Bermuda) Ltd.
4. The Britannia Steam Ship Insurance Association Limited
5. The Japan Ship Owners’ Mutual Protection & Indemnity Association
6. The London Steam-Ship Owners’ Mutual Insurance Association Limited
7. The North of England Protecting & Indemnity Association Limited
8. The Shipowners’ Mutual Protection & Indemnity Association (Luxembourg)
9. The Standard Steamship Owners’ Protection & Indemnity Association (Bermuda) Limited
10. The Steamship Mutual Underwriting Association (Bermuda) Limited
11. The Swedish Club
12. United Kingdom Mutual Steam Ship Assurance Association (Bermuda) Limited
13. The West of England Ship Owners Mutual Insurance Association (Luxembourg)

Vessels shall have in place insurance cover for oil pollution no less in scope and amounts than available under the rules of P. & I. Clubs entered into the International Group of P. & I. Clubs.

The Offtake Tanker Owner must have insurance covering the liabilities under the “International Convention of Civil Liabilities for Oil Pollution Damage 1992”.

7.2.7 Manning and Certification

The tanker owner/operator should timely update Crew Qualifications matrix on OCIMF SIRE website for POVO to review. The following guidelines govern Vessel acceptance:

- Vessel officers shall hold a current license/certificate of rank, including STCW endorsement/certificate.
All officers shall have either “Dangerous Cargo Endorsements” or the satisfactory training specified in STCW. In addition, the four (4) senior officers shall have completed the approved specialized training program and hold an advanced certificate, as per STCW.

Crew members (ratings) shall have sufficient knowledge and experience to carry out their duties and must hold relevant certificates as per STCW.

Vessel manning and certification shall comply with minimum “Flag State Safe Manning and Certification” requirements. However, operational circumstances may require additional manning.

All deck officers shall communicate effectively in English and shall be able to communicate effectively with crew members in a common language. Multinational crews should only be considered if all are fluent in a common language.

A preferred level of experience is for the Master and Chief Officer to have a combined minimum of 9 years of seagoing on board service on that type of Vessel and a combined minimum of 3 years on board service in rank.

7.2.8 Cargo heating

Due to waxy nature of Chim Sao crude, tanker owners are advised that their Cargo heating system should be capable of maintaining cargo temperature not less than 50°C throughout the voyage.

7.2.9 Cargo Hose Handling Crane

Due to possible heavy weather experienced at the Terminal, Vessels equipped with derrick are not accepted for lifting the Chim Sao crude for periods of SW and NE monsoon peaks (June 1 – Oct.1 and November 1- April 1).

The approximate weight of the loading hose to be lifted by Offtake Vessel with a high freeboard is about ten (10) tonnes.

The crane used to lift the hose shall:

- have a certified SWL of at least fifteen (15) tonnes;
- have maximum outreach outboard of the ship’s side of at least 3mtrs;
- be able to lift the hose at least ten (10) meters above the deck;
- be fitted with a safety hook complete with a safety latch or self-locking hook and be fitted with a stinger to keep the block clear of personnel.

7.2.10 Cargo manifold arrangement

Offtake Tankers are to be equipped with a loading manifold in accordance with the OCIMF “Recommendations for Oil Tanker Manifolds and Associated Equipment” 4th edition. Flanges are to be prepared to accept sixteen (16) inch ANSI 150 flange.

7.2.11 Static Tow arrangement

SWL of bollard on poopdeck suitable for (escort tug) Static Tow vessel must be not less than 60MT

7.2.12 Compliance with Local and International Conventions and Regulations
Offtake Tanker Owners must be in compliance with all local and international conventions/regulations, as far as can be determined. Vessels trading internationally must have a Shipboard Oil Pollution Emergency Response Plan.

7.2.13 Drug & Alcohol Policy
Vessel Owners/operators shall have in effect a drug and alcohol policy, complying with OCIMF “Guidelines for the Control of Drugs and Alcohol Onboard Ship.”

7.2.14 Flag State
While it is recognized that individual vessels should not be overly burdened by their flag, where casualty or detention history documented by MOUs or a port state authority results in a “targeted flag” designation by that MOU or authority, this designation will be considered in the review process.

7.2.15 Compliance with ISPS Code
The following guidelines govern Vessel acceptance:

- Vessel must possess a valid “International Ship Security Certificate”;
- Vessel security system equipment must be in working condition;
- Vessel must be capable of interfacing with the offshore terminal at the required security level; and
- Full details of Offtake Tanker Owner’s Security Officer and Ship Security Officer must be provided in Pre-arrival Vessel Information (See the Section 8 “Communication”) and sent to the POVO Operations Superintendent.
- List of 10 Last Ports Of Calls with security levels implemented during these visits to be provided

7.2.16 Vessel Acceptance Automatically Becomes Invalid if there is

- any change of ownership of the Vessel, change of classification society, change in P & I Club, change of technical or operational management, technical or procedural changes on board the Vessel or defects that would affect meeting the acceptance criteria.
- additionally, incidents, port state detentions, unsatisfactory reports from marine terminals, and any other factors judged relevant, may affect whether a Vessel is accepted or maintains accepted status.
- If the particulars given in the VPQ, crew qualification matrix change in any respect or otherwise become inaccurate, the Offtake Tanker Master or the Offtake Tanker Owner shall promptly notify the Operations Superintendent in writing. Without prejudice to any other consequence of such inaccuracy or change, failure to so notify may cause delay or rejection at the Terminal. All cost/time incurred shall be to the account of the Offtake Tanker.
8 COMMUNICATIONS

All vessel movements and cargo transfers within oilfield limits must be informed to and approved by the OIM. Berthing must be suspended and Cargo operations stopped if communication links are lost.

8.1 PRE-ARRIVAL COMMUNICATION

- Masters will advise their agents and the Terminal of the vessel's itinerary and Estimated Time of Arrival (“ETA”) within 24 hrs of vessel acceptance by the Terminal.
- The vessel must provide itinerary and ETA updates weekly thereafter and at 168 hours, 96 hours, 72 hours, 48 hours, 36 hours, and 24 hours in advance of arrival at the Pilot Boarding Ground.
- Any changes in ETA of:
  - greater than one day prior to one week arrival;
  - or greater than four hours within the last week of arrival,
  shall be reported immediately via fax or email to the following:

  Name: Chu Ba Phuong – Marine Superintendent  
  Email: cphuong@premier-oil.com  
  Phone: (84)-8- 39105788 (Ext. 2513)  

  And

  Name: Vo Thi Cam Thuy – Lifting Coordinator  
  Email: vthuy@premier-oil.com  
  Phone: (84)-8- 39105788 (Ext.2516)  
  Fax: (84)-8- 39105799

  And

  Name: Lewek Emas FPSO OIM  
  Email: oim.lewekemas@telaurus.net  
  Phone: (84)-64-3565762 or (870)-7732 01574

Upon establishment of contact, the OCIMF standard format Terminal Information (Appendix E) will be sent by POVO to the Offtake Tanker via the local agent. In response, the Offtake Tanker must send the ICS standard format “Ship to Shore Master/Pilot Exchange” (Appendix C) and other information required in section 8.2.

8.2 PRE-ARRIVAL VESSEL INFORMATION

At 72 hours before arrival, the Master shall also inform the Terminal of the following (metric units required, where applicable):

1. Name of Master
2. Departure drafts
3. Departure displacement
4. Quantity of cargo to be loaded
5. Maximum loading rate
6. Quantity of slops onboard (water and oil)
7. Notification of any defects affecting the safe operation of the ship
8. Confirmation that inert gas system is fully operational and tank contents do not exceed 8% oxygen
9. Security information relates to the last 10 port calls of the ship:
   o The security levels at which the ship operated at ports
   o Any special or additional security measures that were implemented by the ship in any port where it conducted ship/port interface.
   o Whether appropriate ship security procedures were maintained during any ship to ship activity

8.3 SHIP - TERMINAL TRANSFER COMMUNICATIONS
Intrinsically safe portable radios are used for ship/Terminal communications during cargo operations. During transfer, a mutually agreed VHF or UHF channel/frequency will be used for operational communications. Back-up VHF/UHF channel should be agreed in case the main VHF/UHF channels are busy.

OCIMF Ship Shore Safety Checklist (Appendix G) shall be completed before cargo transfer and regular repeating checks to be agreed and performed.

The ship-to-terminal communications will be in English and the following communications protocol shall be agreed to be used during the transfer of crude oil at the Terminal:

- stand by to start transfer,
- start transfer,
- slow down transfer,
- stand by to stop transfer,
- stop transfer,
- emergency stop of transfer

8.4 IMPORTANT CONTACT INFORMATION
It is a requirement that the latest IMO Coastal Contact List must be posted in an easily accessible place on board the Offtake Tanker for use in case of emergency.

8.4.1 Premier – Oil Vietnam Offshore BV
Kumho Asiana Plaza
39 Le Duan street
Ben Nghe Ward,
District 1
Ho Chi Minh City
Phone: +84 (8) 3910 5788
Fax: +84 (8) 3910 5799

8.4.2 Chim Sao Port Facility Security Officer
Phone: +84 (8) 39105788 (Ext. 2513) or +84 903 748822
Fax: +84 (8) 39105799
Email: cphuong@premier-oil.com
8.4.3 Vung Tau Port Authority:
No 2 Quang Trung street,
Ward 1,
Vung Tau City
Vietnam
Phone: +84 (64) 3856084
Fax: +84 (64) 3856137

8.4.4 Vietnam Maritime Search and Rescue Co-ordination Centre (VMRCC)
No 10, Block 1B
Trung Yen Ward
Cầu Giấy district
Hà Nội
Vietnam
Phone: +84 (4) 37683050
Fax: +84 (4) 37683048 (24/24h)

8.4.5 Search and Rescue Coordination Center – Area 3:
No 1151/45, 30/4 Road
Ward 11
Vũng Tàu City
Vietnam
Phone: +84 (64) 3856906
Fax: +84 (64) 3512374
VHF: Channel 16
HF frequency: 7903 KHz

8.4.6 Maritime Security Information Center (MSIC):
No 8 Pham Hung road
Mai Dich Ward
Cau Giay District
Ha Noi City
Vietnam
Phone: +84 (4) 37686 522
Fax: +84 (4) 37685 779
Emails: vnssascentre@hn.vnn.vn & msic@vinamarine.gov.vn

8.4.7 Vietnam Marine Police Headquarter
No 94 Le Loi street
Nguyen Trai Ward
Ha Dong District
Ha Noi City
Vietnam
Phone: +84 (4) 33554 801
8.4.8 Vietnam Marine Police – Region 3
No 1410/11 Ba Muoi Thang Tu
Ward 12
Vung Tau City
Vietnam
Phone & Fax: +84 (64) 3626 396

8.4.9 Weather Forecast Service
National Center for Hydro-meteorological forecasting
No. 4 Dang Thai Than Street
Hoan Kiem District
Ha Noi
Vietnam
Tel: 84-4-38244919 ; 84-4-38244916 ; 84-4-82416000
E-mail: met_int@hn.vnn.vn
http://www.nchmf.gov.vn
9 ARRIVAL PROCEDURE

9.1 ARRIVAL TIME AND NOTICE OF READINESS

Arrival time is considered as the time when the Mooring Master boards the Offtake Tanker, or the time the Tanker arrives at the Pilot Boarding Ground or the time the Vessel arrives at the Anchorage Area, if not berthing immediately.

If an Offtake Tanker tenders its Notice of Readiness (NOR) during its Loading Range but within the last two (2) hours of the Terminal being open, then it shall be deemed to have tendered its NOR at 0600 hours of the next opening day, if berthing has not been completed and loading not commenced prior to the Terminal closing time.

Provided the Mooring Master is satisfied that the Offtake Tanker is in all respects ready to moor and load, the Mooring Master will act on behalf of POVO to sign acknowledgement of the Offtake Tanker's NOR. Such notice of readiness shall be in the English language.

Notice of readiness will not be accepted during a period when the Terminal is closed due to adverse weather.

9.2 APPROACH TO THE ANCHORAGE/PILOT EMBARKATION AREA

When within VHF communication range, the Offtake Tanker’s Master shall confirm berthing prospects with the Terminal. Should it be necessary to anchor, the vessel should proceed to the recommended Anchorage Area.

Transit time from the Anchorage until the “First Line on board” and back to the Anchorage from the “All clear forward” is classified as sea passage and not be counted as laytime.

9.3 ARRIVAL AT ANCHORAGE/PILOT BOARDING GROUND

Means of access to the Offtake Tanker for the lifting operations personnel shall be provided in accordance with the requirements of SOLAS. Early advice will be given by the Terminal to confirm the side of the Offtake Tanker that access should be provided. At night the access area shall be adequately illuminated to provide for the approach and boarding of lifting operations personnel.

9.4 TERMINAL PERSONNEL

In normal circumstances, the following terminal personnel will come on board the Offtake Tanker to fulfill their duties before the vessel approach to berth:
1. Mooring Master
2. Bowman – Mooring Master Assistant
3. Government pilot
4. Cargo surveyor(s)
5. Ship’s agent

It’s the duty of the Offtake Tanker to ensure a comfortable stay onboard of these personnel.
10 MOORING OPERATIONS

10.1 UPDATED NAVIGATION CHART
Masters must ensure that they possess and make use of appropriate current and corrected charts of suitable scale for approaches to the Terminal.

10.2 PILOTS AND MOORING MASTER
As per Vietnamese law, pilotage is compulsory for berthing, unberthing to the Chim Sao Terminal.

POVO will provide the Mooring Master service to assist the Vessel Master. The Mooring Master will advise the Offtake Tanker’s Master on approach to the Terminal, mooring and unmooring, connection and disconnection of hoses, and all other operations within the Terminal area, including all maneuvering of the Offtake Tanker. The Offtake Tanker Master must be on the bridge at all times while the Offtake Tanker is being maneuvered.

Support Vessels that assist in the mooring of the Offtake Tanker are under the direct control and supervision of the Mooring Master.

10.3 PILOT LADDER, TRANSFER OF PERSONNEL AND EQUIPMENT
Vessels must ensure that they use correct rigging and that the pilot transfer equipment and arrangements are in good operating order. Pilot boarding arrangements must comply with SOLAS 74 Chapter V Regulation 17 – Pilot Transfer Arrangements or any amendment of same.

Infield personnel transfer criteria

*No personnel transfer from the Field Support Boat to Offtake Tanker if significant wave height is more than 2.0 m*

Upon the approach of the Mooring Master on the Support Vessel, the Offtake Tanker must provide a good lee on the appropriate side. The Offtake Tanker shall also have their crane rigged and crew on deck standing by.

Mooring Master will board the incoming Offtake Tanker at the anchorage area or another agreed location. The Mooring Master and his assistants, if any, will normally board Offtake Tankers from the Support Vessel which will also be used for the purpose of providing a Static Tow throughout the loading operation. Immediately upon the boarding of the Mooring Master and his assistant, the Support Vessel will proceed to the crane area of the Offtake Tanker where mooring and hose connection equipment will be lifted aboard.

10.4 SUPPORT VESSELS
All ships utilizing the Terminal will be assisted by an Offshore Support Vessel provided by POVO for berthing and unberthing
For this purpose, POVO has two modern AHTS of more than 7,000 horsepower with Bollard pull of more than 70 tonnes. POVO support vessels provide a 52mm towing pennant which is required to be made fast to the Tanker via closed chock and bits situated as close to the centerline of the stern as possible.

10.5 BERTHING/MOORING OPERATIONS

10.5.1 Pre-berthing preparations

During the approach of the Offtake Tanker towards the stern of the FPSO, the ship’s crew, under the advice of the Mooring Master will prepare the forecastle for the mooring operation. Sufficient crew members must be present to handle the mooring line.

The following equipment, provided by the Offtake Tanker, shall be ready for use when the Mooring Master boards:

- On the forecastle, for tandem mooring hawser handling:
  - Empty mooring winch drum where the tandem mooring pick-up rope is spooled in
  - two (2) heaving lines for picking up the FPSO mooring hawser messenger line from the support vessel deck
  - a grapnel for recovery the FPSO messenger line from sea surface
  - a selection of shackles, wire strops and tools (sledge hammer, crowbar, etc).

- On the main deck port side in front of accommodation block for hose handling:
  - a heaving line
  - 200 mtrs buoyant mooring rope, 40 – 44 mm dia.

Please refer to the sketch below:
PREPARATION FOR SEMI-BOATLESS CARGO HOSE TRANSFER ONBOARD EXPORT TANKER AT CHIM SAO TERMINAL

(this sketch should be sent to Export Tanker as pre-arrival requirement)

PRE-OFFTAKE DEPLOYMENT OF TANKER’S MESSENGER LINE

Figure 8: Pre-offtake deployment of hose handling rope on export tanker
• On the poop deck for static tow wire handling:
  o two (2) heaving lines
  o a selection of shackles, chain stopper and tools (sledge hammer, crowbar, etc).

10.5.2 Pre-berthing Conference

Before proceeding to the berth, the Mooring Master will discuss with the Offtake Tanker Master and brief the Offtake Tanker's officers on the procedures to be followed in berthing and mooring.

The Offtake Tanker Master will advise the Mooring Master of the Offtake Tanker's handling characteristics and ensure that the Mooring Master is given the Offtake Tanker's pilot information card to study. The Mooring Master will personally observe the engines being tested ahead and astern and the helm being put hard over to each side. Before commencing berthing operations, the Pilot Card (Pre-Berthing Safety Check List) in the form set out in APPENDIX F shall be completed and signed by the Offtake Tanker Master and the Mooring Master.

10.5.3 Mooring Operations

When the approach to the Terminal commences, the Support Vessel will be in attendance to assist if necessary. Approach to the Terminal involves maneuvering within close quarters. It is therefore imperative that all measures are taken to ensure that there is no loss of power or steering during these maneuvers.

The Offtake Tanker's anchors will only be used in case of extreme emergency and upon express permission of the Mooring Master.

On the final approach and at a distance of approximately one and half (1.5) to two (2.0) nautical miles, the Support Vessel towing pennant will be made fast on the stern bollard of the Offtake Tanker for Drag Tow and Static Tow purposes. On approaching the berth, the hawser messenger line will be passed from the FPSO stern by either of the following methods subject to Mooring Master discretion:

• allowing the messenger rope to float free and drift aft of the FPSO stern to a distance of approximately three hundred (300) meters. The Offtake Tanker's crew on the forecastle will use a grapnel to pick up the messenger line from the sea surface then use the windlass or mooring winch to heave it in further;
• or a rocket from a pneumatic line throwing apparatus when the Offtake Tanker's bow is at a distance of approximately one hundred and fifty (150) meters from the FPSO. The Mooring Master will then instruct the crew to heave in the ropes successively until the mooring hawser chafe chain is drawn through a fairlead and in a position to be secured to a chain stopper (At least three (3) chafe chain links must be passed beyond the chain stopper tongue/hinged bar in a “made fast” condition);
• a Support Vessel will maneuver alongside to the port shoulder and attach the mooring pick-up rope to the Offtake Tanker's messenger line. The Offtake Tanker will then heave up the messenger and pick-up rope.
• The eighty (80) mm diameter pick-up rope is secured to seventy-six (76) mm chafing chains, which in turn are secured to the one hundred (100) m finish length twenty-one (21) inch circular grommet type hawser which is connected to a seventy-six (76) mm chafing chain at the FPSO stern.

The Offtake Tanker will then heave up the messengers and pick-up rope, carefully picking up the slack as the Vessel approaches the stern of the FPSO.

The distance between the Vessels will be continuously relayed to the Mooring Master on the bridge from the forecastle.

**ENGINES MUST BE MAINTAINED IN A CONSTANT STATE OF READINESS AND AT NO TIME DURING THE OFFTAKE TANKER'S STAY AT THE TERMINAL MAY THE ENGINES BE IMMOBILIZED.**

In cases when there is a failure of an Offtake Tanker's main propulsion machinery or steering gear, which renders the vessel incapable of instant maneuverability, the Mooring Master shall be informed immediately. The support vessel shall then tow the Offtake Tanker to a safe location. All charges incurred as a result of this failure shall be to the Offtake Tanker Owner's account.

**10.5.4 Speed Reduction Sequence And Limits On Approaching FPSO**

*For purpose of guidance, Vessel approach speed should normally be reduced to*

- < 12 knots @ 10 nautical miles from the FPSO
- < 5 knots @ 3 nautical miles from the FPSO
- < 0.5 knot @ 1000 meters from the FPSO
Figure 9: Tanker mooring steps
11  CARGO HOSE HANDLING

11.1 DUTIES OF MOORING MASTER AND VESSEL CREW
Upon completion of the mooring operation, the loading hose will be connected to the Vessel Port side manifold which must be prepared to accept one 16 inch 150 ANSI flange. Hose connection will be made by the ship's crew under the supervision of a responsible deck officer. The Mooring Master or his Assistant will advise on the correct procedures to be adopted.

11.2 SWL OF THE HOSE HANDLING CRANE
Depending on the freeboard of the Vessel, the weight of the hose string to be lifted could reach 10 tons. All Vessels calling at Chim Sao Terminal must have their portside Crane/derrick rigged with SWL not less than 15 tonnes.

11.3 HOSE TRANSFER
The Tanker End Hose will be transferred to the Offtake Tanker manifold area by utilizing a support boat if weather conditions are within limits stated in the 5.4.17. Boatless hose transfer to tanker manifold is the method to implement when weather conditions are not safe for the field vessel to come alongside the tanker at the manifold area. Deploying the 40-42 mm dia. X 220m messenger rope along port side main deck as preparation for boatless hose transfer should be made before berthing commences

11.4 HOSE LIFTING AND CONNECTION
The hose will then be lifted to a position above the main deck so that the Snubbing chain can be made fast to the hose securing bitts using a auxiliary chain with Pelican hook, such that the hose flange will closely align with the required manifold flange. As the hose being lifted swings widely in rough sea conditions, sufficient strong restraining ropes must be readily available at the manifold area. The hose end will then be lowered to the deck and the blind flange will be removed. The hose flange will normally be connected to the manifold by a quick release Camlock coupling.

11.5 TANKER RAIL HOSE SUPPORT
When the hose is connected, the length between the manifold and rail will be supported by a nylon web sling to ensure that there is no undue strain on any part of the manifold or hose string.

11.6 HOSE DISCONNECTION
After Vessel is informed by the FPSO that the hose displacement with nitrogen is completed, the hose end butterfly valve will be closed, followed by the Tanker’s manifold valve. Certain amount of time is allowed to ensure no pressure trapped inside the hose string before the hose end valve is closed. Once the spool piece has been drained into the Vessel drip tray, the hose will be disconnected from the manifold, the Towing flange will be put on and bolted and the hose support slings will be removed.
11.7 TRANSFER OF THE TANKER RAIL HOSE TO FIELD SUPPORT BOAT

If there is the risk of mooring hawser/chain/pickup arrangement to be fouled with the offloading hose string during the cast off of the mooring hawser from the tanker bow, the Tanker Rail Hose should be transferred to the field support boat to tow the hose string clear.
12 CARGO AND BALLAST OPERATIONS

Vessels using the Terminal shall comply with cargo and ballast handling procedures and precautions as recommended in the fifth edition of ISGOTT including, but not limited to, the following:

12.1 PRE-OPERATIONAL MEETING AND INSPECTION

Before any cargo or ballast operations commence, a pre-operational meeting will take place between the Terminal representative and either the vessel’s Master and/or its officer in charge of cargo and ballast operations.

The purpose of this pre-operational meeting is to:

1. Agree on procedures for ascertaining mutual compliance with the Ship/Terminal Safety Checklist
2. Discuss any deficiencies arising from the Ship/Terminal Safety Checklist and agree on any additional precautions necessary. **Note:** The Terminal reserves the right to refuse to load a Vessel if any substantive deficiencies remain unresolved.
3. Agree on procedures for taking cargo samples, gauging, testing IG quality, slop measurement and, if necessary, ballast samples.
4. Agree on a load plan, which shall include:
   - Quantity and type of cargo to be loaded.
   - Loading rates.
   - de-ballasting procedures and rates.
   - Emergency procedures.
5. Agree on communications to be used during the operation. As a minimum, communication shall be at least every 60 minutes and more often as the situation dictates.
6. Agree on connecting/disconnecting procedures.
7. Agree on measures for wax control described in Section 13.
8. Agree that transferred volumes will be compared every one hour.

12.2 OPERATIONAL PROCEDURES

A representative from the Terminal will, occasionally, witness the vessel’s dips/ullages/water dips/temperatures/samples as appropriate to the operation.

The ship’s crew is responsible for connecting/disconnecting the loading hose under direction of the Mooring Master or his Assistant

The following procedures apply to loading operations:

1. Before loading can commence, the vessel shall confirm that the vessel is ready in all respects, that vessel systems are correctly lined up, and that a responsible crewmember is stationed close to the manifold.
2. The Terminal shall advise the vessel that it is commencing loading at a slow initial rate (as agreed in the pre-operational meeting).
3. The vessel shall advise the Terminal when it can confirm that cargo is being received.
4. The vessel shall confirm that no leaks have been detected prior to asking for the loading rate to be increased.

5. The vessel shall keep the Terminal advised of loading rates and expected time of completion.

6. The vessel shall provide adequate notice of requesting a slow down in loading rate for switching tanks or topping off.

7. The Terminal shall provide adequate notice to the vessel before increasing or decreasing the loading rate.

8. The vessel shall provide ten minutes, five minutes and one minute notice before completion of loading.

9. The vessel shall notify the Terminal when the discharge of segregated ballast has commenced and when it is completed.

12.3 CONDITIONS TO BE OBSERVED DURING THE OPERATION

Representatives of the Terminal and the vessel must check relevant items on the Ship/Terminal Safety Checklist at intervals not exceeding that agreed in the declaration. Any unsafe condition must be reported immediately to the other party and operations stopped until it is rectified.

In addition to procedures and precautions as recommended in the fifth edition of ISGOTT, the following are required for Vessels loading at the Terminal:

- An English speaking officer shall be stationed in the Cargo Control Room at all times. This officer should maintain communication with the FPSO CCR and the Mooring Master.

- Venting of cargo tanks shall only take place through the ship's fixed venting arrangements.

- Ullage, sounding and sighting ports must be kept securely closed.

- Overboard valves connected to the cargo or bilge system must be sealed on arrival.

- Spool pieces for connecting the ballast and cargo systems on SBT tankers must be disconnected and stowed in their proper place except when specifically required by the Mooring Master for back flushing operation on completion of loading operation.

- No tank cleaning is permitted.

- Responsible ship’s crew equipped with an intrinsically safe portable radio, will maintain a presence at the ship’s manifold and on the forecastle at all times during loading operations.

12.4 PUMPING RATES

- Initial pumping rate shall be mutually agreed between the FPSO Marine Supervisor, Mooring Master and Offtake Tanker Master/Chief Officer. A single meter stream should be used. Initial rate below 500 m³/h (Equal 20% of one meter stream maximum rate of 2,500 m³/hr) is not recommended in sake of meter accuracy.

- Maximum pumping rate: To ensure high accuracy of the FPSO metering system, the pumping rate must be maintained stable as long as possible and close to the pumping rate during meter provings. Normal pumping rate is about 30,000 bbls/hr.
• Topping up rate: single meter stream should be used with the rate mutually agreed but to be within flow range of one meter stream i.e. 500 – 2,500 m3/hr.

12.5 COMPLETION OF LOADING
The Offtake Tanker will advise the Mooring Master when to stop cargo loading unless the nominated quantity has been delivered by the Terminal, in which case the Terminal will stop the cargo transfer. On completion of pumping, the oil remaining in the offload hose will be blown through to the Vessel with nitrogen. Following this operation the terminal will inform the Vessel that loading is completed and all flow has ceased. The Offtake Tanker’s tank valves can be closed slowly, followed by the Offtake Tanker’s manifold valve shut, the loading hose end butterfly valve shall be closed LAST.

12.6 DRAINING OF CARGO PIPEWORK
Before commencement of cargo tank dipping, proper draining of all cargo pipework contents shall be carried out in witness of the Terminal Representative/Mooring Master and Cargo Surveyor.
13 WAX CONTROL PROCEDURE

Due to the high wax content and high pour point of the Chim Sao crude, it is imperative that immediately after stop of cargo transfer, the hose string content is displaced with medium to ensure wax deposition is minimized in the hose and to ensure pumpability through the hose string for the next offloading.

The wax control procedure described below should be implemented whenever cargo transfer operations is suspended or completed.

Terminal may adopt one of the following methods to clear the waxy crude oil inside the floating hose string:

- Blow with compressed nitrogen from FPSO to Offtake Tanker or
- Displace with FPSO slop water or
- Blow with nitrogen from FPSO to the Export Tanker on completion of cargo transfer then hose is transferred to connect to FPSO flushing manifold for flushing with hot water

13.1 BLOWING THE FLOATING HOSE WITH NITROGEN

At cessation of pumping the terminal shall inform the vessel that pumping has finished and hose clearing will be initiated. It is the duty of the Offtake Tanker to line up the cargo line and vent line to ensure the chosen receiving tank is not over-pressurized and/or oil is spilled out from the receiving tank. The Offtake Tanker shall then inform the Terminal that their system is lined up and nitrogen blowing can commence. The ship's crew and one deck officer should be placed on standby at the cargo manifold, ready for hose clearing. The Terminal will advise the Vessel when hose blowing is completed. The terminal and the Vessel shall then vent down the hose to zero pressure before the disconnecting process commences.

Hose depressurization is achieved by opening the valve on the cargo piping system to allow nitrogen to escape into cargo tank. Never relieve the pressure by opening a vent valve fitted on the cargo offload line to avoid oil spill.

Nitrogen Blowing is one of emergency responses to the following situations:

- FPSO black out when the cargo pump is not available for implementing the method using slop water as described in section 13 above
- Emergency disconnect of tanker is required such as to avoid imminent collision with FPSO or Offloading manifold

Safety precautions stipulated in the ISGOTT (Fifth edition) subsection 11.1.14.4 “Clearing Hoses and Loading Arms to the Terminal” should be followed.

13.2 HOSE CLEANING - FLUSHING

When hose string is required to be dismantled for any reason, hose flushing is carried out as follows:

After hose blowing is completed, the hose is disconnected off the tanker manifold then transferred to the 2nd support boat to bring the Tanker Rail Hose to the port quarter of the FPSO for connecting the hose to the flushing manifold.

The hose string will be flushed with FPSO hot water to remove all crude oil remaining inside the hose. Hose flushing will take place for around 15 minutes or until the returning water is
above 50 deg C to ensure deposited wax within the hose reaches a temperature sufficient to remove it.

After hose maintenance, the hose string will be blown with nitrogen to make it ready for the next cargo offloading.
14 GENERAL PRECAUTIONS AND EMERGENCIES

Every Vessel moored at the Terminal shall at all times retain sufficient officers and crewmembers on watch to deal with an emergency and be ready to disconnect the hose and mooring line if necessary. All machinery essential to the safety of the ship and its ability to maneuver must be maintained in normal operating condition. Repairs and other work that may impair the safety of the ship and its ability to maneuver are only permitted per Section 14.7 of these Terminal Regulations. The Master and Vessels using the Terminal must comply with fire, pollution and other precautions as recommended in the fifth edition of ISGOTT including, but not limited to, the following:

14.1 CONTINGENCY PLANS

The Offtake Tanker Master and the Mooring Master shall discuss and agree on the action to be taken in the event of the following circumstances occurring:

- fire on board the Offtake Tanker;
- fire on board the Terminal;
- FPSO and Export Tanker swings to heading where WHP is located downstream
- oil spillage from the Offtake Tanker;
- oil spillage from the Terminal;
- sudden onset of adverse weather, including electrical storms;
- forecast adverse weather or electrical storms;
- breakdown of the Static Tow or any other circumstances that may lead to the Offtake Tanker riding up on or swinging toward the Terminal facilities;
- excessive loads on the tandem mooring hawser;
- failure or serious damage to the tandem mooring hawser;
- excessive fishtailing or failure to stay inside the offtake safe sector
- loss of power and/or ability to maneuver on the part of the Offtake Tanker.

The Offtake Tanker Master shall provide the Mooring Master with a copy of the Offtake Tanker's emergency response and contingency plans.

14.2 FIRE PRECAUTIONS

- Fire wire must be rigged on starboard side forward and regularly adjusted as the draft changes. This fire wire may be used by 2nd support vessel to reduce hawser angle to avoid contact with FPSO Stern Offloading Manifold
- Fire-fighting appliances on the vessel, including the main and emergency fire pumps, must be kept ready for immediate use.
- Fire hoses shall be connected to the fire main on the main deck and adjacent to the manifolds, ready to be run out
- Two portable fire extinguishers of the dry powder type (minimum 12 kilograms each) shall be kept ready at a suitable distance from the manifold.
- Foam monitors adjacent to the manifold must be trained towards the manifold.
- Smoking onboard must only be allowed in locations agreed by the Master and Terminal representative. Smoking warning notices, specifying designated smoking places must be displayed in conspicuous places onboard.
- The use of matches and lighters is prohibited except in designated smoking areas. Personnel outside these areas must not carry matches or lighters.
14.3 ACTIONS IN CASE OF FIRE ON FPSO OR ON BOARD VESSEL

In case of fire at the Terminal or onboard the ship, the alarms and instructions contained in Appendix H - CONTINGENCY PLAN IN THE EVENT OF FIRE DURING OFFTAKE OPERATIONS shall be followed. Should a fire occur on the Offtake Tanker, the Offtake Tanker Master or responsible officer shall make an immediate signal of a Continuous sounding of the Vessel’s whistle and by sounding of the general alarm bells and place the Offtake Tanker’s engines on standby. The Terminal shall be informed and all loading operations will cease immediately, manifolds shut and preparations made to disconnect hoses and vacate the berth if required. The 2nd Support Vessel shall then be on standby for fire fighting / rescue operations.

14.4 POLLUTION PRECAUTIONS

- Pollution prevention equipment for handling small oil spills should be readily available.
- Scuppers must be properly plugged.
- Accumulations of water on deck must be drained carefully. Scupper plugs must be replaced immediately after water has been drained. A vessel crewmember must be in attendance at the location where water is being drained from the deck to the sea.
- In the event of any cargo leakage, operations must be immediately stopped until the cause has been ascertained and the defect remedied. The Terminal must be advised immediately.
- IG scrubber overboard must be monitored for significant water discoloration. Any noticeable discoloration must be immediately rectified or, failing this, the load/discharge operation may be stopped until the problem has been resolved.
- Smoke emissions must be kept to a minimum. Excessive emissions may result in the Terminal stopping the load/discharge operation until the problem has been resolved. Soot blowing is prohibited.
- No garbage shall be discharged overboard from the ship.

14.5 TERMINAL POLLUTION RESPONSE EQUIPMENT

The Terminal is equipped with OSR equipment sufficient to cope with Tier 1a (up to 15 tonnes of oil) oil spill as per PetroVietnam Spill Categorization, The following will be offshore on each support vessel and FPSO.

- Oil spill dispersant spray unit: Supply boat mounted type
- Oil absorbent& dispersant:
  - 10 bales of Sorbent pad 17" x 19" x 3/8"
  - 10 bales of Sorbent boom 8" DO
  - 2,000 liters of Superdispersant -25

Plus 2 off NOTIL (Nymphea Oil Trawler Instant Launch) on on the FPSO

There is a local contractor for Oil Spill Response service for any size of oil spill with a response time of 24 hrs. They have designated boat with booms, skimmers and dispersant etc.
14.6 SHIP STABILITY
The Master of the ship is responsible for maintaining the stability of the ship with a minimum Metacentric Height (“GM”) of 0.15m throughout the load/discharge operation as per SOLAS 74 requirements.

14.7 REPAIR AND MAINTENANCE
Hot work or any other repair work, including boiler tube cleaning, chipping and scraping, hull painting, testing or servicing of electrical equipment, is prohibited unless the ship applies in writing to the OIM, specifying the repair work to be carried out and the OIM grants written permission for the work to proceed.

Repair or other work that may immobilize the ship is prohibited.

14.8 SUSPENSION OF LOADING AND UNBERTHING IN EMERGENCIES
In any of the following conditions, the Offtake Tanker Master in consultation with the Mooring Master and OIM shall ensure that loading and/or deballasting operations are stopped and, if the circumstances require, the hose disconnected and the Offtake Tanker unberthed:
- fire on board the Offtake Tanker;
- fire on board the FPSO;
- oil spillage from the Offtake Tanker;
- oil spillage from the Terminal;
- sudden onset of adverse weather, including electrical storms, squalls;
- forecast adverse weather or electrical storms;
- breakdown of the Support Vessel providing the service of Static Tow or insufficient pulling power of these boats to counteract adverse weather or any other circumstances that may lead to the Offtake Tanker riding up on or swinging toward the FPSO;
- excessive loads on the tandem mooring hawser;
- failure or serious damage to the tandem mooring hawser;
- excessive fishtailing or the Offtake Tanker or hawser angle could not be held inside the Safe Offtake Sector
- loss of power and or ability to maneuver on the part of the Offtake Tanker;
- any other conditions which in the opinion of the OIM, the Mooring Master or the Terminal Representative present a risk to life, the environment or property.

WAX CONTROL PROCEDURE DESCRIBED IN THE SECTION 13 SHOULD BE FOLLOWED WHENEVER CARGO TRANSFER IS SUSPENDED OR STOPPED TO AVOID BLOCK OF THE FLOATING HOSE AND EXPORT PIPEWORK

14.9 DRUG AND ALCOHOL POLICY
The Terminal operates a ZERO TOLERANCE drug and alcohol policy, which must be strictly adhered to. No alcoholic beverages shall be consumed by the Offtake Tanker Master, any officer or crew of the Offtake Tanker during its stay at the Terminal or offered by the Offtake Tanker Master, any officer or crew of the Offtake Tanker to any Terminal personnel. If at any time anyone involved in or connected with the mooring, loading or unmooring operation is found to be under the influence of drugs or alcohol, the operation will be stopped immediately. Penalties in Vietnam for illegal drug usage and trafficking are severe, up to and including the death penalty.
14.10 SECURITY REQUIREMENTS

Terminal operations will be conducted in accordance with security regulations from time to time in force at the Terminal and notified to the Offtake Tanker. If applicable, the Offtake Tanker may be required to provide copies of its International Ship Security Certificate, enter into a Declaration of Security defining the security responsibilities of the parties involved in the operations, and/or provide any other data or documents to the Terminal as required by the Chim Sao Marine Terminal Port Facility Security Plan and International Ship and Port Facility Security Code.
15 CARGO DOCUMENTATION AND INSPECTION

15.1 INTRODUCTION
POVO HCMC office will co-ordinate the Lifting Parties’ documentation requirements and will relay such requirements to the Offtake Tanker’s master and the Terminal as indicated below.

15.2 CARGO REFERENCE NUMBER
Each Shipment of Crude Oil from the Chim Sao Terminal will be allocated a unique Cargo Reference Number, this will consist of the letters CS and a three digit of sequential numbers
CS stands for Chim Sao.
E.g. CS-001
In the event that split parcels are loaded for more than one buyer then the letters A, B, C will be added after the cargo reference number.
E.g. CS-001A, CS-001B etc.,
The Cargo Reference Number will be advised in voyage order/loading instructions and SHALL be quoted on ALL cargo documents and in ALL correspondence relating to a particular cargo.

15.3 INSTRUCTIONS FOR OFFICE USE
Upon receipt of Lifting Party’s requirements, POVO’s Operations Superintendent will transmit to the OIM, Marine Supervisor and POVO Operations Offshore Representative the following information (E-Mail/Fax may be used as back up)
A) Cargo Reference Number
B) Vessel name
C) ETA – Local time and date
D) Cargo Quantity required – in barrels
E) Destination – as required for Bill of lading
F) Cargo Documentation – this will indicate the complete documentation instructions in the following manner.
   1. Consignor
   2. Consignee
   3. List of Documents Required
   4. Distribution of Document Sets
   5. Vessel Sailing Advice distribution
   6. Any special instructions relating to documentation

15.4 AGREED CARGO FIGURES
As soon as possible after completion of loading, the Operations Superintendent is to advice the Offtake Tanker Master – by radio – of the metered loaded quantity.
In this context “Gross” figures are cargo quantities calculated at 60 degrees F (barrels) or 15 degrees C (metric). “Net Figures” are obtained by deduction of base sediments and water as measured on the terminal and advised by the Operations Superintendent.

Comparison of ship/terminal figures should be made with quantities corrected to standard temperature. FPSO metered GSV should be compared with the Offtake Tanker’s TCV (Total Calculated Volume) and FPSO’s TCV

15.5 DISPUTED CARGO FIGURES

If the Offtake Tanker measurement of the quantity of cargo loaded, taking into account the vessel’s usual experience factor (If tanker is full loaded at Chim sao terminal) is still significantly different (>0.5%) from the terminal figures after recheck of the measurement and calculations of the quantity and this has been done in the presence of the independent inspector, the Terminal Representative and Mooring Master, the Bill of Lading shall be completed using the higher figure and the matter may then be referred for determination to an expert appointed by the Lifter and the Operator. The Offtake Tanker’s Master may advise as follows:

“On behalf of my owners/charterers, I wish to protest that the cargo quantity measured on board the Offtake Tanker is ______________ Gross Barrels”.

Notes of protest, if any, should be handed to the Terminal Representative (Or Mooring Master) for further delivery to POVO. The Terminal Representative (Or Mooring Master) will acknowledge receipt of the Note of Protest only, and is not authorized to signify acceptance of such letters.

The FPSO is equipped with a fiscal metering/proving system and it is these figures verified by an independent inspector which shall be inserted on the Bill of Lading and other cargo documentation. However, an independent survey shall still be conducted on board the Offtake Tanker to act as back-up should a technical fault occur in the metering unit. In the event of meter failure during a lifting, the quantity, to be included in Cargo Documents, shall be determined by the Terminal Operator and verified by the independent inspector: Offtake Tanker Ullaged figures are the first option and FPSO ullaged figures are the second option taking into consideration the relevant factors contributing the reliability of these figures such as vessel movements during ullagings, size of the Vessel, vessel’s experience factor, quantity of free water found on board the FPSO before and on board the Vessel after cargo transfer, status of the FPSO cargo tank segregation valves, Vessel Discharging Ratio for the last cargo, COW history, etc. The failure of the FPSO Crude Oil metering system to be reported and acknowledged by the Independent Surveyor who witnesses the lifting.

The determination shall be conclusive and binding on the parties.

15.6 CARGO DETAILS

After consultation and agreement from the POVO Offshore Operations Representative, the Operations Superintendent will advise the Offtake Tanker Master of the following (E-mail may be used as back up)

1. Cargo Reference Number
2. Gross/Net U.S. Barrels at 60 degrees F
3. Gross/Net Long Tons
4  Gross/Net Cubic meters at 15 degrees C
5  Gross/Net Tonnes (metric)
6  Density
7  A.P.I. Gravity
8  B.S&W

These details will be used to complete the Bill of Lading and terminal Certificate of Quantity, Quality and Origin as indicated hereunder.

15.7 STANDARD SET OF CARGO DOCUMENTS

A “Standard Set” of cargo documents will consist of the following:

9  Bill Of Lading
10 Certificate of Quality
11 Certificate of Quantity
12 Certificate of Origin
13 Cargo Manifest
14 Tanker Loading Time Report
15 Receipt of Documents and Samples
16 Notification of Departure

Stocks of these blank forms are retained on the Terminal.

15.8 BILL OF LADING

The Bill Of lading is the Offtake Tankers Master’s receipt for cargo shipped and contains a description of the oil (grade and quantity – Gross and Net) loaded.

- U.S. Barrels at 60 degrees F
- Long Tons
- Cubic meters at 15 degrees C
- Tonnes (metric)

A standard Bill Of Lading form will be used for all cargoes loaded at the Terminal and the Bill Of Lading for a particular cargo will be dated on the date when the Offtake Tanker finally completes loading her cargo (irrespective of the number of Parties involved in the ownership of such cargo).

Up to three (3) original Bill of Lading – namely, the Original, Duplicate and Triplicate (or First, Second and Third) – may be required: care shall be taken to ensure that instructions relating to these documents are followed precisely. Each original Bill of Lading shall be stamped with the appropriate stamp and all copies shall be stamped “Copy – Non-Negotiable”.

It is essential that details relating to the Consignor, Consignee and Destination are entered on the Bill of Lading precisely as indicated in the respective documentation instructions.

In the case of two or more parcels of the same cargo, the Cargo Reference Number will be additionally identified with a Letter suffix- for example CS-001A, CS-001B etc.: It is essential
that both Bill of Lading and the certificates of Quality, Quantity and Origin are correctly numbered in such cases.

The Quantities to be entered on the Bills of Lading will be those advised by the Marine Supervisor and agreed with the POVO Operations Superintendent/Offshore Operations Representative and the attending Inspector.

15.9 CERTIFICATE OF QUANTITY, QUALITY AND ORIGIN

The quantities and cargo characteristics, to be entered on this document will be advised by the Operations Superintendent and agreed by the POVO Offshore Operations Representative and the attending Inspector.

Original Certificate shall be stamped “Original” and all copies of the document shall be stamped “Copy”.

15.10 DISTRIBUTION

(For Offtake Tanker Master only)

The Offtake Tanker master will receive two (2) sets of Cargo Documents only:

- Set No 1: One copy of each document, which is to be retained on board for the Offtake Tanker master’s use only.
- Set no 2: For delivery to the Consignee at the port of discharge: the contents of this set – i.e. the number of original and/or copy documents – will be advised in accordance with 15.1 above

(for POVO’s HCMC office)

ALL the remaining sets of documents – i.e. Set No 3 and above – will be distributed by POVO’ HCMC office as instructed under 15.3 above.

15.11 TIME SHEETS

The Mooring Master will maintain accurate record of all offtake-related timings and provide POVO Operations Superintendent for completing a standard form “Vessel Loading Time Report”, ensuring that as so far as is possible the times entered are agreed upon with the Offtake Tanker master.

15.12 SAMPLING, METERING AND ANALYSIS FACILITIES

The “in-line” sampler will be used for all official samples of the cargo loaded at the terminal.

The fiscal metering system will be used as the primary method to determine the total quantity of cargo transferred during the loading operation. The meters will be proved during the offload.

A fully equipped laboratory on the Terminal is provided for the Crude oil analysis that conforms to the internationally recognized American Society for Testing and Materials (ASTM) standards for the measurement of crude oil.

This laboratory is used for obtaining all the information required for the analysis of the official sample and completion of the Quality Certificate for the cargo, which forms a part of the official cargo documentation.
The terminal will prepare three (3) two-litre samples and one five-litre sample for each lifting (and for each portion of a lifting if necessary). The samples will be used as follows:

- One (1) two-litre sample shall be used for Quality determination.
- One (1) five-litre sample shall be retained by the Terminal for a period of one hundred (100) days.
- Two (2) two-litre samples shall be handed to the Master of the Offtake Tanker, one each for the Offtake Tanker Owner/Charterer and Consignee.

The Master of the Offtake Tanker will execute a receipt for samples and this will be one of the official cargo documents for the lifting.

15.13 TIME TO COMPLETE DOCUMENTS

In normal circumstances all required documents should be provided to the Offtake Tanker master within approximately three (3) hours of completing loading.
16 UNBERTHING & DEPARTURE PROCEDURES

16.1 UNBERTHING

Following completion of the cargo calculation and paper works, unmooring of the Offtake Tanker will commence. Upon advice from the Mooring Master, the mooring hawsers will be heaved in by the Offtake Tanker and the mooring connections will be released. In some cases it may be necessary to briefly run the engines ahead to relieve the weight on the moorings. As soon as the moorings are released, the engines will be run astern and the vessel will back away from the FPSO. During the move astern, the mooring hawsers will be lowered into the water by easing back on the pick up ropes.

Floating hose must be held clear of the Offtake Tanker bow by 2nd support boat to avoid damage by mooring hawser chafe chain during cast off from the tanker bow chain stopper. *The Support Vessel at the stern of the Tanker will only be released when the Tanker is safely away from FPSO and WHP.*

When the Offtake Tanker is safely cleared of the FPSO, the Terminal lifting equipment will be back loaded to the Support Vessel for return to Terminal.

16.2 NORMAL DEPARTURE

Documents such as Bills of Lading, Certificate of Quality, Certificate of Quantity, Time Loading Report, Certificate of Origin, Cargo Manifest and Master’s Receipt for Documents/Samples are prepared at Chim Sao Oil Terminal. When the Vessel has completed loading, the documents will be completed and taken aboard the Vessel for the Master’s signature. Signing of these Documents by the Master will take place at the same time as the final departure clearance formalities are being carried out.

16.3 EARLY DEPARTURE PROCEDURE

For operational and safety reasons, POVO may require the Offtake Tanker which has completed its loading operations to depart prior to completion and delivery of the following documents:

- bill of lading
- certificate of origin
- certificate of quantity
- certificate of quality
- cargo manifest
- Vessel loading time report
- notification of departure
- receipt for documents and samples
- notice of protest (if applicable)

The Offtake Tanker Master shall issue a letter of authorization to its agent, with a copy to the Operations Superintendent, authorizing its agent to sign the Bill of Lading and other cargo
documentation for and on behalf of the Offtake Tanker Master once the Bill of Lading and other cargo documentation has been completed.

After departure of the Offtake Tanker, the final density, base sediment and water content of the cargo shall be determined by POVO and witnessed by an independent Surveyor. This shall be derived from the analysis of the representative sample taken from the metering unit. A sealed portion of this sample shall be placed on board the Offtake Tanker before departure.

The Operations Superintendent shall inform the Offtake Tanker Master of the gross and net cargo quantity loaded at sixty (60) degrees Fahrenheit. This will usually be in the form of a faxed, unsigned, non-negotiable Bill of Lading pro forma. The Offtake Tanker Master shall as promptly as possible inform the agent to sign cargo documentation on his behalf or give such other instructions, as he deems necessary.

When all the cargo documentation has been signed by the Operations Superintendent and the agent acting on behalf of the Offtake Tanker Master, a complete set of cargo documents shall be faxed to the Offtake Tanker Master by its agent.
17 APPENDICES

APPENDIX A: INTERTANKO'S STANDARD TANKER CHARTERING QUESTIONNAIRE 88 (Q88) - Version 3

APPENDIX B: OFFICERS' QUALIFICATIONS AND EXPERIENCE MATRIX

APPENDIX C: SHIP TO SHORE MASTER/PILOT EXCHANGE

APPENDIX D: SHORE TO SHIP PILOT/MASTER EXCHANGE

APPENDIX E: CHIM SAO MARINE TERMINAL INFORMATION

APPENDIX F: PILOT CARD (PRE-BERTHING CHECKLIST)

APPENDIX G: SHIP / FPSO SAFETY CHECK LIST

APPENDIX H: CONTINGENCY PLAN IN CASE OF FIRE DURING OFFTAKE OPERATIONS

APPENDIX I: OFFTAKE CONTINGENCY PLAN WHEN WHP IS RIGHT DOWNSTREAM OF FPSO

APPENDIX J: CHIM SAO CRUDE OIL ASSAY

APPENDIX K: CHIM SAO CRUDE OIL MATERIAL SAFETY DATA SHEET

APPENDIX L: CONDITIONS OF USE FOR TERMINAL FACILITIES.

APPENDIX M: CHIM SAO CARGO DOCUMENT FORMS