DAHEJ LNG TERMINAL

TERMINAL INFORMATION
AND
PORT REGULATIONS MANUAL

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DEFINITIONS

For the purpose of this Manual, the following definitions apply:

Agent - means the shipping agency appointed by the vessel's owners.

Approved Equipment - means equipment of an approved design that has been tested and certified by a recognized authority (e.g. a Government Department or Classification Society etc.) as being safe for use in a specified zone, manner or condition and duly endorsed by a certifying stamp on such equipment and the accompanying certificate as issued by the authority.

Berth Area - means the North and South LNG Jetty, the trestle joining each LNG Jetty and respective mooring dolphins, berthing dolphins and the discharging platform.

Cargo Machinery - means cargo compressors, cargo vaporizers, inert gas generators, their motors, control equipment, pipelines and other cargo receiving equipment. It shall also include, where appropriate, primary and emergency power supply, circulating pumps, other auxiliary machinery and equipment essential for the safe and efficient operation of the cargo machinery.

Crew - means collectively the personnel involved with cargo discharging operations, and all other persons related to these operations on behalf of the Ship.

Concession Agreement - means the agreement between Petronet LNG Limited (PLL) and the Gujarat Maritime Board (GMB) granting PLL an exclusive right and authority to design, develop, construct, own, operate and maintain the Dahej LNG Terminal and certain assets in relation thereto for import and handling of LNG and the right to regulate the use of the Terminal.

Conditions of Use - means the document titled 'Conditions of Use for the PLL Terminal'

CHA - means the Custom House Agent appointed by PLL.

Dahej LNG Terminal (also referred as 'Terminal') - means North and South LNG Jetty, the surrounding area within the radius of 0.5 Nautical Miles and Dahej LNG Regasification Terminal, as well as the Terminal management designated by PLL. Such management includes the person or persons his deputies and assistants, authorized by PLL, to exercise the powers or perform the duties in respect of making and enforcing regulations, administration and control of the plant.

Dahej LNG Terminal Regulations - means these regulations together with their attachments and any amendments or modifications attached thereto.

Draught - means the depth below the waterline of the deepest part of the vessel.

Drugs - means narcotic; also, any substance or chemical agent, exclusive of food, employed for other than medical reasons to obtain a given physiological effect or satisfy a craving.

Environmental Guidelines - means the guidelines issued by GMB/PLL, any Government Authority, or as specified by law, advising on the minimum acceptable environmental

requirements and maximum permissible criteria for effluent, gases and operational wastes, etc.

ESD - means the emergency cargo shutdown and loading arm disconnection.

ETA - means the Estimated Time of Arrival.

Gas Carrier - means any vessel designed for the bulk carriage of liquefied gases by sea.

Gas Free - means a tank or compartment or container into which fresh air has been introduced in sufficient quantities to lower the level of any flammable, toxic, or inert gases to that required for specific purpose. e.g., Hot work, entry etc.

GMB - means the Gujarat Maritime Board.

Head Port Operations - as defined in Section 17.2.

High Modulus Polyethylene (HMPE) – A manufactured fiber based on Ultra High Molecular Weight Polyethylene (UHMPE).

Hot Work - means work involving sources of ignition or temperatures sufficient to cause the ignition of flammable gas mixture.

Hot Work Permit -means a document issued or approved by GMB/PLL, permitting specific hot work over a specified period of time in a defined area.

IMO - means the International Maritime Organization.

Intrinsically Safe - means the condition whereby any spark or thermal effect, generated by the normal operation or accidental failure of the equipment, is incapable, under prescribed test conditions, of igniting a prescribed gas mixture. Any equipment so rated will be certified, by the appropriate body as "intrinsically safe".

ISGOTT - means the International Safety Guidelines for Oil Tankers and Terminals.

ISM -means the International Safety Management Code.

Inert Condition - means a condition where the atmosphere throughout the tank or space has been reduced to not more than 8% oxygen by volume for an oil tanker or 2% for an LNG tanker through the introduction of inert gas.

Inert Gas - means a gas or mixture of gases such as flue gas, containing insufficient oxygen to support the combustion of hydrocarbons.

Law - means any international convention, act, rule, law, legislation, statute, regulation, ordinance, decree, notification, policy, by-law, administrative guideline, ruling, instruction, directive, code, requirement, consent, license, approval, permit, judgment, court order, treaty or any interpretation thereof by a government authority or any other competent authority.

L.G.H.P - means the Liquefied Gas Handling Principles on Ships and at Terminals.

LNG - means liquefied natural gas.

LNG Berth - means the North and South LNG jetty consisting of the main platform, mooring and breasting dolphins and other facilities installed thereon.

LNG Port Control (JCR) - means the jetty control room, fitted with communication facilities and other equipment for the safe operation of the berth.

LNG Exclusion Zone - means that area as shown as defined in Sec 4.4 of this manual which no other vessel using the Port may enter.

LOA - means the length overall of the vessel.

MARPOL - means the International Convention for the Prevention of Pollution from Ships.

Master - means, when in use in relation to a Ship, any person having the command of the vessel for the time being and may be construed by the present regulations, at the option of the Master, as a responsible person delegated by the Master to undertake general or specific duties in liaison with the Terminal, provided that the Master shall at all times have sole responsibility for the application of the present regulations.

Monsoon - Refers Southwest monsoon of Arabian Sea, and the weather conditions prevailing during such monsoon period. For the purpose of this manual, period from 15th day of May to 15th day of Sep of a year will be considered as monsoon period.

Naked Lights - means open flames, exposed incandescent material or any other unconfined source of ignition.

Non-monsoon - Refers to that period of a year which is other than monsoon period. For the purpose of this manual, period from 16th day of September of a year to 14th day of May of ~~a~~ following year will be considered ~~as~~ non-monsoon period.

North Berth – Berthing facility at North LNG jetty consisting of main platform, mooring dolphins, breasting dolphins and other facilities installed thereon.

OCIMF - means the Oil Companies International Marine Forum.

Petronet LNG Limited (PLL) - means a company owning liquefied natural gas (LNG) receiving, storage and regasification terminals at Dahej (State of Gujarat).

Permit to Work - means a document issued by terminal, permitting specific work to be performed during a specified period in a defined area under strict safety conditions.

Port - means the Dahej Port area under the jurisdiction of the GMB.

Port Access Documents - means the documents submitted to the Master by the Pilot upon boarding the vessel that are required by PLL and Governmental Authorities for the entry and departure of the vessel.

Port Area - means the area of land and water enclosed by and including, the Main and Lee breakwaters~~,~~ and the Port security fence.

Port Authority - means Gujarat Maritime Board (GMB), the conservator of Dahej LNG Terminal.

Port Limits - means the limits as shown on Indian Chart 2082 issued by the National Hydrographic Office, Government of India and as defined in these regulations under the authority of the GMB.

Port Operator - means the Sparkle Terminal & Towage Services Limited (STTSL), or any successor of STTSL in its capacity as the party interested with the operation, management and administration of Dahej LNG Terminal pursuant to the terms of Port Operation Services Agreement (POSA) between PLL and STTSL signed on 02nd August 2016 to be responsible for administration and control of the Port. Such management includes the person or persons, his deputies and assistants authorized by PLL, to exercise the powers or perform the duties in respect of making and enforcing regulations administration and control of the Port.

Port Regulations - means Dahej LNG Terminal Regulations.

Port Tariff - means those dues and charges made by the Government Authorities for entry into the port of Dahej.

SBT - means segregated ballast tank.

Ship / LNG Tanker - means a special purpose vessel constructed and equipped for the transportation of liquefied natural gas in bulk at specified temperatures and pressures corresponding to the atmospheric boiling points of the liquefied gases.

Ship's Agent - means a Custom House Agent (CHA) to obtain inward / outward clearances and other liaison work on behalf of the Charterers.

SIGTTO - means the Society of gas tanker and Terminal Operators.

SOLAS - means the International Convention for the Safety of Life at Sea.

South Berth – Berthing facility at South LNG jetty consisting of main platform, mooring dolphins, breasting dolphins and other facilities installed thereon.

Terminal Operator - means PLL's representative supervising the LNG discharging operation from the LNG Tanker.

Trim - means the difference between the forward and aft draughts.

Tug Mooring Dolphin-Single Point Mooring Dolphins for tug mooring/hanging.

Vessel - means any ship, dredger, tug, craft or other floating navigable object.

VTPMS - means 'Vessel Traffic and Port Management System' implemented in the Gulf of Khambhat with effect from 15th Aug 2010.

VTS Fees - Charges imposed by GMB, payable to VTMPS operator in respect of all types of vessels entering or already existing in the VTS notified area of Gulf of Khambhat.

GENERAL

DAHEJ PORT

Dahej Port is situated on the east side of the Gulf of Khambat, bounded by an area between Latitudes 21^0 44' North and 21^0 35' North, with the western boundary in Longitude 72^0 29' East and from there to the shoreline which includes the entrance to the Narmada River.

Within the port area on the western shore there are currently five jetties. The southernmost two jetty serves PLL and each of the other serves a separate Terminal. There is also a jetty serving a chemical plant in the Narmada River itself. The above jetties operate under the conservancy of the Port Officer, GMB – Bharuch. The whole port area is under the jurisdiction of the Gujarat Maritime Board (GMB) as shown in chart BA/IN 2082 Approaches to Dahej.

PETRONET LNG LTD. (PLL)

The Petronet LNG Terminal (Dahej LNG Terminal) is situated in the southern reaches of the port area and comprises of two independent LNG jetties. 'North jetty' can accommodate LNG Tankers of capacity up to 220,000 m^3 and 'South Jetty' can accommodate LNG Tankers of capacity up to 270, 000 m^3.

Activity: Construction work of 3rd Jetty and two Tug mooring Dolphins to the South of its existing South jetty is in progress.

GUJARAT CHEMICAL PORT LIMITED. (GCPL)

GCPL utilises a jetty and trestle situated approximately 1.17 miles to the north of the LNG Terminal jetty and is designed to receive tankers up to 60,000 dwt for the import of chemicals, Ethane and petroleum products.

DAHEJ HARBOUR AND INFRASTRUCTURE LTD (DHIL – BIRLA COPPER)

DHIL utilises a jetty and trestle situated a further 0.5 miles to the north of the GCPL jetty and is designed to accept bulk carriers of up to 70,000 dwt for the import of bulk products. The jetty also has the capability to handle ammonia and phosphoric acid.

ADANI PETRONET PORT PRIVATE LTD (APPPL)

APPPL solid bulk Terminal utilises two berths and a trestle situated in the immediate North of Petronet LNG Terminal.

SECTION 1: BASIC PRINCIPLES

1.1 OBJECTIVE

This manual containing Regulations and Information of Dahej LNG Terminal and has been introduced by Petronet LNG Limited (PLL) to ensure safe and efficient operations at the Terminal.

1.2 APPLICATION

The Regulations herein apply to all operations from preparation for the ship's berthing to the un-berthing at the Terminal.

Nothing in this manual shall interfere with the requirements of any special or additional rules or regulations that may be introduced by the Government of India, Government of Gujarat, Gujarat Maritime Board (GMB) or PLL in respect of the ship to which these rules apply.

1.3 JURISDICTION

Ships, the Masters and Crews thereof are subject to the present Regulations and the applicable laws of Government of India, Government of Gujarat and GMB from preparation for berthing to un-berthing. Such laws must be strictly enforced. Deviation from the present Regulations is only permissible with the written consent of the Terminal and, where appropriate, GMB.
Masters are advised to consult the ship's agent for the interpretation of Government Laws or Regulations and Regulations for Dahej LNG Terminal. Masters are also advised to consult Dahej LNG Terminal in respect of interpretation of the present regulations.

1.4 CODES AND REGULATIONS

The Master and his crew shall observe the following regulations, where appropriate to Terminal Operations:

- Port Regulations
- SOLAS (International Convention for the Safety of Life at Sea consolidated edition).
- MARPOL (International Convention for the Prevention of Pollution from Ships).

The Master and his crew shall observe the relevant laws, recommendations and regulations issued by the following:

- International Chamber of Shipping (ICS)
- Oil Companies International Marine Forum (OCIMF)
- International Maritime Organization (IMO)
- Society of International Gas Tanker & Terminal Operators (SIGTTO).

The Master shall produce a copy of the following documents:

- Ship's Cargo Handling Manual
- Ship's Emergency procedures
- Ship's General Arrangement Plan
- Ship's pre-checks records
- Ship's Fire Control and Safety Plan

1.5 RESPONSIBILITIES

The Master is responsible at all times for ensuring the safety of his Ship and Crew and the prevention of accidents and pollution,and shall make every endeavor to issue appropriate instructions and guidance to his Crew.

When the requirements of the present regulations conflict with any provision of the operating and/or emergency procedure manuals with which a ship is provided, it shall be brought to the attention of Dahej LNG Terminal prior to the start of cargo handling.

The present Regulations shall not be interpreted as releasing in regard to the Master's or Crew's obligations as defined by appropriate legislation or in regard to their duty to follow the principles of good seamanship under all circumstances.

1.6 APPLICATION OF DAHEJ LNG TERMINAL REGULATIONS

Dahej LNG Terminal Regulations are issued pursuant to the Concession Agreement and shall apply to all persons and vessels within the Port Limits.

Nothing in these Regulations shall be construed as overriding or contradicting any applicable Laws and the practice of good seamanship.

Nothing contained herein shall be construed as relieving the Master of any vessel from his responsibility for the safety of the vessel under his command. Masters of all vessels visiting the Port shall sign and agree to the **"Conditions of Use"** (as per **Appendix 1**).

PLL reserves the right at any time, to alter, change or amend any or all of the provisions contained in these Regulations and in the **"Conditions of Use"** with or without prior notice.

The Master and owners of each vessel utilizing the Port shall ensure that such vessel, and its Master, Officers and Crew, comply with all applicable Laws and the **"Conditions of Use"**.

Vessels nominated for the Port shall be capable of operating within the limitations of the berth, discharging facility, and mooring equipment, as set forth in this manual. It is the responsibility of the Master, the owners, and the operators of each vessel nominated for the Port to ensure the safe conduct of its operations at the Port, and to ensure that such vessel meets the following requirements:

1. Vessels shall be designed, constructed, equipped, operated and maintained so as to comply with the provisions of the IMO IGC Code, and amendments, for the Carriage of Liquefied Gases in Bulk. Vessels designed for the carriage of liquefied gases in bulk, which for any reason are not subject to the provisions of the IMO Code, shall hold a valid certificate issued by the flag administration of the vessel, or by a Classification Society acceptable to PLL, confirming that the Vessel is designed, constructed, equipped, operated and maintained to the IMO standards for such Vessels.

2. Vessels shall have on board a Master and sufficient Officers and Crew trained and qualified in accordance with the relevant provisions of the [International Convention on Standards of Training, Certification and Watchkeeping for Seafarers 1978], and any subsequent amendment, where applicable. In all cases, the training

qualifications and experience of the vessel's staff shall be appropriate for the safe conduct of the discharging operations being conducted at the Port and the nature of the products being handled.

3. Vessels shall have and retain onboard sufficient personnel with good working knowledge of the English language at all times, to enable operations to be carried out safely and efficiently and to maintain immediate and reliable ship/shore communications on operating matters and in emergency situations.

4. Vessels shall have on board a complete and valid set of Safety Certificates including SOLAS and Classification Society Certificates. A Certificate of Fitness is required in the case of all vessels carrying liquefied gases in bulk, together with a General Arrangement Plan in the English language showing the layout of the vessel. Valid Certificates of Competency for all appropriate personnel in accordance with the law of the state in which the vessel is registered are also required.

5. PLL shall have the right to inspect at any time, the vessel and all required certificates and documents to ensure compliance with these Dahej LNG Terminal Regulations. The Masters and owners of the vessels shall also provide PLL with copies of any document relating to the condition and/or maintenance of the vessel which PLL may require, including without limitation, class records.

6. Vessels shall vacate the jetty as soon as discharging operations are completed, or at any other time as so directed by PLL. PLL reserves the right to require the vessel, on completion of discharging, to proceed to the anchorage to await cargo documents.

7. PLL shall, at its own discretion, have the right to suspend or cease cargo operations and may require the removal of any vessel from the Port.

8. Neither PLL, nor its servants or agents (in whatsoever capacity they may be acting), shall be liable for any direct or indirect costs and expenses incurred by a Vessel, its Owners, Operators or Agents arising in any way whatsoever from the employment of Pilots, Tugboats, Stevedores or Longshoremen who, even if employed by PLL shall be deemed to be servants and in the service of the Master/Owners and under their instructions. Neither PLL, nor its servants or agents (in whatsoever capacity they may be acting), shall be liable for any direct or indirect costs and expenses incurred by a Vessel, its Owners, Operators or Agents as a result of a refusal to discharge all or part of a nominated shipment, delay to or suspension of discharging, or a requirement to vacate the berth.

1.7 GUJARAT MARITIME BOARD (GMB)

The GMB bylaws are currently under revision and shall be promulgated on issue.

Attention in the meantime is drawn to the notice below:

Under the authority of the Indian Ports Act 1908 (No.15) Sections 5, 6 & 21; GMB Act 1981; and any subsequent notifications and amendments, Masters of vessels coming to, and at, the Port should be aware that the bylaws of the Gujarat Maritime Board (GMB) also apply. They should familiarize themselves with these Regulations and should ensure that the bylaws and Regulations are brought to the attention of their Officers and other crew members and that they are strictly adhered to.

Government Local Authorities take a serious view of any oil and gas liquid spillages and vapour releases. Any such release shall be investigated by the appropriate authorities and, apart from the Master and or the Owners of the vessel being charged with the cost of cleaning up the spill or in dealing with the vapour release emanating from the vessels

and the consequences thereof, the Master and or Owner may be liable to prosecution and delay to the vessel could well arise.

1.8 CONSERVANCY

The jurisdiction of the Port is under the GMB Port Officer, Bharuch.

1.9 GENERAL REQUIREMENTS

1.9.1 CONTRABAND

Dealing in contraband is strictly forbidden and Masters are advised that heavy penalties will be imposed for any crewmember dealing in drugs or other illicit goods.

Masters should ensure that the crew personal effects declaration is exhaustive so that Customs Authorities do not treat such items as undeclared and therefore contraband.

1.9.2 LIQUOR

The use and possession of alcohol is forbidden in the State of Gujarat. (i.e., a jurisdiction where the import, sale, purchase and consumption of alcohol is prohibited) Masters are to ensure that the bonded store is sealed prior to the vessel's arrival alongside and an accurate declaration prepared for presentation to the competent authorities. Alcohol should not be taken ashore. Penalties may be imposed on any infringement of the law.

1.9.3 DRUGS

The use or possession of Drugs anywhere within India is strictly forbidden with severe penalties for any transgressor. Masters are reminded of their responsibility for the security of prescription drugs carried on board vessels.

1.9.4 FIREARMS & ARMED SECURITY GUARDS

In general, vessel arriving at Dahej LNG Port shall not carry firearms, ammunitions or explosives. However, vessels with Armed Security Guards prior to arrival at Dahej LNG Terminal shall carry out necessary reporting and procedures as per the requirement of state administration through their agents.

1.9.5 PORT SERVICES

Only services provided or authorized by PLL shall be utilized within the Port limits. Requests for the various services shall be made through the ship's agent. No third party services, equipment or facilities shall be allowed within the Port limits without the written approval of PLL.

1.9.6 PORT TARIFF AND CHARGES

PLL reserves the right to issue the Port Tariff which will contain the terms and conditions and the scale of charges that shall apply for the use of premises, facilities, works, equipment and services within the Port. PLL reserves the right to alter, change, or amend from time to time any or all charges, terms, conditions or interpretations contained in the Port Tariff with or without prior notice.

1.9.7 PORT CLEARANCE

Every vessel wishing to leave the Port shall obtain a Port Clearance issued by the Customs.

A Port Clearance for outward sailing may be withheld from any vessel for any violation of the provisions of the Laws and Dahej LNG Terminal Regulations, or for any legal cause or restraint duly ordered by the Court in India, or for non-payment of Port Charges.

1.9.8 SHIP/SHORE CO-OPERATION

The Master shall ensure that the staff charged with the responsibility of conducting or overseeing the cargo operations and related duties are qualified and competent, including the ability to communicate in English. Sufficient personnel shall be made available on ship at all times to ensure that PLL requirements for safe and efficient operations and mooring practices, are observed and that adequate ship/shore liaison is maintained. The Master and his delegated staff shall ensure that the instructions and requirements that may be imposed by PLL, pursuant to these Dahej LNG Terminal Requirements, are attended to and performed with reasonable despatch and in an appropriate manner.

1.9.9 CAMERAS

The use of cameras, including video cameras, within the Port limits is strictly prohibited without the prior written permission of PLL.

1.9.10 INTERNATIONAL SHIP AND PORT FACILITY SECURITY CODE (ISPS Code)

Dahej LNG Terminal is ISPS compliant and all vessels calling at the Port must meet the requirements of the ISPS Code. Vessels are required to confirm compliance with the Code in the **'Pre-Arrival Notification of Security (PANS)'** as per **Appendix 2**.

For Port Facility Security Officer (PFSO) details refer to Section 17.3

Dahej Port has a designated Patrol Boat "Sea Care I" for carrying out Security Patrolling of the Waterfront.

The tugboats and Pilot boats are always on standby during the Ship berthing / un-berthing and during her entire stay at the berth.

(During monsoon season tugboats are used for Security Patrolling.)

1.9.11 VESSEL STANDARDS

Ships calling for the first time and ships who have not visited the Port in the last six (6) months may be subject to a safety inspection in accordance with SIGTTO / OCIMF recommendations prior to commencement of cargo discharging. Update inspections shall be performed on successive visits at the discretion of PLL.

SECTION 2: CONDITIONS OF ACCEPTANCE

2.1 GENERAL

Dahej LNG Terminal has a LNG Ship approval and acceptance procedure.

Ships are authorized by PLL to unload their LNG cargo at the Dahej LNG Terminal only upon successful completion of such procedure.

2.2 COMPLIANCE

The Masters and Owners shall ensure that their LNG Tankers discharging at Dahej LNG Terminal complies with all relevant international statutory rules for classification, construction, operation and management. The LNG Tanker will only be accepted if all applicable by-laws, laws, rules and regulations are adhered to.

Vessels of 25 years or more in age intending to call at Dahej Port are required to take special permission from GMB. Ships are advised to consult their agents for further details.

2.3 PRE-CHECKS

It is required that, within 3 days prior to the ship's estimated time of berthing the following checks and tests shall be carried out successfully and duly recorded in the ship's logbook:

- Water spray systems.
- Water curtain
- Gas free condition of hold spaces if inerting not required.
- Operation of cargo system remote control valves and their position indicating systems.
- Alarm function of fixed gas detection equipment.
- Cargo system gauge and alarm set points.
- Operation of the Emergency Shut-Down system (ESD).

The corresponding records shall be produced by the Master upon the Ship's arrival at Dahej LNG Terminal.

Any defects or deficiencies related to these checks and tests must be reported to the Terminal prior to her arrival in the **'Standard Pre-Arrival Message'** as per **Appendix 3**.

Additionally, the Master of the LNG Tanker on her arrival at Dahej LNG Terminal should duly declare the deficiencies (using **'Vessel Deficiency Notice'** in **Appendix 4**) which are deemed to affect the safe and efficient operation of the vessel at the Terminal.

2.4 SHIP STANDARDS AND CONDITIONS

Ships shall be designed, constructed, equipped, operated and maintained in accordance with the provisions of the IMO IGC code, and amendments (International Code for the Construction and Equipment of Ship's Carrying Liquefied Gases in Bulk).

2.5 CREW STANDARDS AND CONDITION

The Master is required to present valid Certificates of Competency and other Certificates of training and qualifications for all appropriate personnel in accordance with the

relevant provisions of the International Convention on Standards of Training and watch keeping for Seafarers (STCW), as introduced by the flag state administration.
The Master and his crew, in respect of their respective tasks and duties, shall be aware of Dahej LNG Terminal Regulations, its facilities, equipment and cargo handling procedures.

The Master and his crew shall be experienced and trained in order to ensure safe conduct of cargo handling, discharging, ballasting and any other operations planned to be carried on whilst the ship is at berth at Dahej LNG Terminal.

Ships will not carry out any operations whilst at berth unless the Terminal is satisfied that adequate ship's crew is available on board at all times and a strict deck watch is maintained.

2.6 NON-COMPLIANCE

Ships are accepted for discharging LNG at Dahej LNG Terminal when they are able to comply with all regulations in respect of the safe containment of cargo and the means for indicating cargo system pressures, temperatures and cargo liquid levels.

Ships are accepted for discharging LNG at Dahej LNG Terminal on the understanding that operations are conducted safely and expeditiously and that the ship vacates the Terminal as soon as practicable after operations are completed.

The Terminal reserves the right to suspend operations and require the removal of any ship from the berth for:

- Flagrant or continuous disregard of the present regulations.
- Defects in the ship, equipment, manning or operations, which in the reasonable opinion of the Terminal present a hazard to Terminal's premises, personnel or operations.
- Onboard operational performance (appropriate to the type of operation) that fails to utilize the available Terminal facilities satisfactorily and thereby, in the reasonable opinion of the Terminal, constitutes an unacceptable constraint on the operations.

Dahej LNG Terminal will not be liable for any costs incurred by a ship, its owners or its agents as a result of a refusal to discharge all or part of a nominated shipment, delay to or suspension of discharging, or any other operation conducted whilst at Dahej LNG Terminal, or a requirement to vacate the Berth arising from the present regulations.

The Terminal reserves the right to monitor the cargo discharging of any ship to ensure compliance with the codes and regulations mentioned in Section 1.4 ("Codes and Regulations"), and to notify the appropriate authority in the event of contravention.

SECTION 3: PRE-ARRIVAL INFORMATION

3.1 EMAIL / FACSIMILIE COMMUNICATIONS

Vessel arrival information or any query about Dahej LNG Terminal should be sent through electronic mail to the following PLL email id:

amitashat@petronetlng.in
vikassingh@petronetlng.in
anishnishchal@petronetlng.in
shipping@petronetlng.in

3.2 ETA

Vessel is required to inform PLL of her ETA at the Pilot Boarding Area on departure of the vessel from loading port with confirmation 72 hours (for voyages longer than 72 hrs), 48 hours, 24 hours and 5 hours prior to her arrival. Also in addition, send ETA 5 hours prior entering to Gulf of Khambhat. All times to be in Indian Standard Time (GMT + 5.5 hours). The Vessel is required to establish contact with Dahej LNG Terminal as soon as practicable.

All ETA messages shall also be copied to:

ssdhj@oceansparkle.in
ssdhjpoc@oceansparkle.in

3.3 VHF COMMUNICATION

At least three hours prior to arrival vessels should contact the Petronet Marine Terminal (call sign '**Petronet Marine**') on VHF Channel '**16/74/67'** for advice on berthing instructions. A listening watch shall be maintained on VHF channels. Vessel's to provide pre arrival information over VHF as required by '**Petronet Marine**'.

3.4 PRE-ARRIVAL MESSAGE

The LNG tanker shall on departure from the load port transmit the following:

1. The '**Standard Pre-Arrival Message**' as per Appendix 3
2. Duly filled & signed copy of '**PANS'** as per Appendix 2
3. Duly signed copy of arrival crew list.
4. Copies of following most recently endorsed ship certificates and reports showing their validity for the Terminal verification purposes:

    I. Certificate of Registry
    II. P&I Club Cover Certificate (with 'Wreck Removal' & 'Pollution' cover)
    III. International Oil Pollution Prevention Certificate
    IV. International Load Line Certificate
    V. Cargo Ship Safety Radio Certificate
    VI. Cargo Ship Safety Construction Certificate
    VII. Cargo Ship Safety Equipment Certificate
    VIII. Safety Management Certificate
    IX. Classification Certificate
    X. Document of Compliance
    XI. International Ship Security Certificate

XII. Safe Manning Document
XIII. International Tonnage Certificate
XIV. Certificate of Fitness
XV. International Sewage pollution prevention certificate
XVI. International Air Pollution Prevention Certificate
XVII. International Antifouling System Certificate
XVIII. Certificate of Civil Liability for Bunker Oil Pollution
XIX. CAP rating (if applicable)
XX. Statement of compliance for CAS (If applicable)
XXI. Latest PSC report in India and abroad (if inspected)
XXII. Classification status report
XXIII. Company own inspection report if permitted by Ship Owners
XXIV. TMSA reports.
XXV. CTMS certificate
XXVI. Certificate of accuracy of cargo tank tables.
XXVII. Maritime Labour Certificate (with Declarations Part I & II)
XXVIII. International Ballast Water Management certificate
XXIX. Ship Sanitation Control Certificate/Exemption Certificate

SECTION 4: NAVIGATION

4.1 CHARTS

Indian charts must be used for navigation while calling at Dahej. As per GMB directives all vessels calling Gujarat coastline are required to carry Indian charts onboard for Port approaches and for entire coastline of Gujarat.
Note: Indian charts in electronic format is acceptable.

Charts serving Dahej, Gulf of Khambhat region are:
British Admiralty and Indian Charts & ENC (published by Indian Hydrographer Office):

- BA/IN207/IN3207DG :DIU HEAD TO GOPNATH POINT (SCALE - 1: 1,50,000)
- BA/IN254/IN3254GK :APPROACHES TO GULF OF KHAMBHAT (SCALE - 1: 3,00,000)
- BA/IN2039/IN42039G :GULF OF KHAMBHAT-NORTHERN PORTION(SCALE - 1:75,000)
- BA/IN2082/IN52082A :APPROACHES TO DAHEJ (SCALE - 1 : 25,000)
- BA/IN2110/IN62082D :DAHEJ HARBOUR (SCALE - 1 : 12,500)
- IN208/IN3208GK :GULF OF KHAMBHAT (SCALE - 1 : 1,50,000)
- IN2044/IN42044G :GULF OF KHAMBHAT-SOUTHERN PORTION(SCALE - 1: 1,00,000)

Admiralty Pilot No. 38: Northwest West Coast of India Pilot should also be consulted.
All Ships / Ship Owners are requested to verify above contents from the relevant publications.

4.2 OUTER APPROACHES & DESCRIPTION AND POSITION OF BUOYS IN THE NARMADA CHANNEL

In Gulf of Khambhat, a channel designated as the Narmada Channel has been identified for use of LNG tankers.

This channel is marked with 9 (1 fairway buoy + 8 channel buoys) buoys spaced at a distance of 5 NM. These are as shown on the relevant Charts of Indian National Hydrographic Office. The 9 buoys laid are in accordance with IALA standards.

LOCATION OF BOUYS IN NARMADA CHANNEL

Sr. No.	NAME/CHARACTERSITICS	LATITUDE (N)	LONGITUDE (E)
1	Fairway Buoy	20°35.62' N	071°56.27' E
2	Lateral Green	20°36.61' N	071°58.59' E
3	Lateral Red	20°40.56' N	071°58.92' E
4	Lateral Red	20°44.50' N	072°02.46' E
5	West Cardinal	20°47.92' N	072°07.26' E
6	Lateral Red	20°53.01' N	072°06.01' E
7	West Cardinal	20°56.00' N	072°09.40' E
8	East Cardinal	20°59.55' N	072°06.68' E
9	Lateral Red	21°02.51' N	072°09.20' E

The buoys are liable to shift due to prevalent strong currents.
Heavy Fishing traffic may be encountered outside Narmada channel entrance.

Masters are advised to inform PLL:

- If any of the buoys in the channel have either shifted from their Charted Position and/or if their lights are not working.

- If any changes in the Charted depth observed so that other vessels can be warned and the Hydrographic Office can be informed.

Ship may encounter strong current while transiting Narmada channel.

It is advisable that the Ship may enter the Narmada Channel approximately 6 hrs prior the Pilot boarding time when approaching in ebb tide and approximately 5 hrs prior the Pilot boarding time when approaching in flood tide so as to arrive Pilot Boarding Point at desired time.

4.3 ANCHORAGE

An anchorage is designated for the use of LNG tankers that may have to anchor prior to berthing or after un-berthing. Vessel should avoid anchoring, however, if it is extremely necessary to do so, LNG Tankers should anchor WEST of Petronet Jetty inside the following designated anchorage area or in a suitable position as advised by VTPMS.

Designated Anchorage Area:

1. Lat 21°43.30' N Long 072°25.00' E
2. Lat 21°43.30' N Long 072°28 50' E
3. Lat 21°35 00' N Long 072°28 50' E
4. Lat 21°35 00' N Long 072°25.00' E

Prohibited Anchorage Area:

Ships should not anchor in the area East of the line joining coordinates.

1. Lat 21°35.00' N Long 072°28.50' E
2. Lat 21°43.30' N Long 072°28.50' E

Masters are advised that strong tidal currents are prevalent in the Gulf of Khambat and great caution must be exercised while anchoring. A continuous and proper anchor watch must be kept at anchorage with Main Engines at short notice. Use of the second anchor under foot and picking it up before every change of tide must be considered.

It is advisable that ships wait outside before entering Narmada Channel.

4.4 LNG EXCLUSION ZONE

The area immediately in the vicinity of LNG berth is an exclusion zone for all vessels except for LNG tankers calling at Petronet LNG Terminal under the control of a Pilot. Other vessels are prohibited from entering this area.

The limit of the zone is defined by line joining following points:

(i)	21° 40.65' N	072° 30.44' E
(ii)	21° 40.66' N	072° 30.73' E
(iii)	21° 39.93' N	072° 30.74' E
(iv)	21° 39.92' N	072° 30.45' E

4.5 UNDER KEEL CLEARANCE

Sufficient water exists at each berth to allow a minimum under keel clearance at Chart Datum for ships draught of 12.7 meters.

4.6 VESSEL TRAFFIC AND PORT MANAGEMENT SYSTEM (VTPMS)

VTS is operational in the Gulf of Khambhat region. It is controlled by VTS Khambhat, Aatash Norcontrol.

The VTS area covers the entire Gulf of Khambhat, Area North of Latitude 20° 30' N and East of Longitude 071° 20' E.

The entire VTS area is divided in to three Sectors:
VTS Khambhat North:
Area North of Latitude 21° 12.2'N up to Landfall

VTS Khambhat West:
Area North of Latitude 20° 30'N, East of Longitude 071° 20'E, West of Longitude 072° 20'E, South of Latitude 21° 12.2'N

VTS Khambhat East:
Area North of Latitude 20° 30'N, East of Longitude 072° 20'E, South of Latitude 21° 12.2'N

Call Sign: VTS Khambhat

Appendix 19 showing diagram of VTS area and VHF Channels of each sector.

LNG Tanker intending to call Dahej LNG Terminal shall obtain the details of VTS reporting procedure from their agents.

4.7 JETTY WARNING LIGHTS

Warning lights are established on extreme mooring dolphins of each jetty to mark its extremity. These lights are fixed on steel poles of 2.0 m height and have elevation level of about 18.0 m above Chart Datum.

Location and Characteristics are:

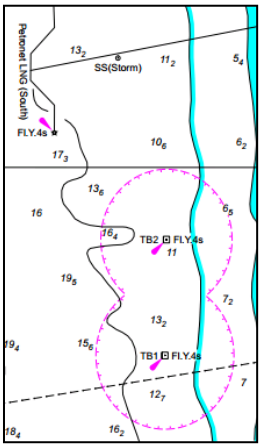
North Jetty MD1 and MD5 – Fl.W.4s 3 nm
South Jetty MD1 and MD8 – Fl.Y .4s 3 nm

4.8 TUG MOORING DOLPHINS

Single Point Mooring Dolphins TB1 and TB2 exist in the southern reaches of Dahej LNG Terminal for Tug mooring.

Dolphins are marked with warning lights having the characteristics Fl.Y.4s and special Top mark of yellow colour.

Unauthorized entries within 200 m of TB1 and TB2 are prohibited.



SECTION 5: PILOTAGE AND TOWAGE

5.1 PILOTAGE

Pilotage is compulsory for all vessels using the Dahej LNG Terminal. Vessel speed is to be kept at less than 5 knots while picking up the pilot.

Pilot boards the vessel about 2 hours before the HW / LW at PBG (LNG) in position 21°38.28'N; 072°28.40'E as marked on chart BA/IN2082/ENC-IN52082A. POB time is confirmed by the Terminal on receipt of 24 hrs notice.

Pilot should be escorted from deck to Navigation Bridge immediately upon boarding and ISPS formalities should be conducted at Bridge only. Pilot may either remain on board or stay in close vicinity within terminal during vessel's stay.

5.2 PILOT BOAT

The Terminal provides a dedicated pilot boat "ARROW-2" for transferring pilots.

However, in rough seas / swell, transfer will take place from one of the tugs which have a safe access platform. The design speed of the pilot boat is 12 knots.

5.3 PILOT BOARDING ARRANGEMENTS

Vessel shall take advice from 'Petronet Marine' (at the time of making first radio contact with the Terminal as per Sec 3.3 of this manual) for boarding arrangement to be rigged for Pilot embarkation. Normally, Pilot embarks through Ship's Gangway using tug.

The boarding area shall be adequately lit. Weighted heaving lines must not to be used.

A ship's officer in radio communication with the bridge shall be in attendance with at least two crewmen to assist personnel boarding.

The use of automatic pilot hoists is not permitted.

The Master of the vessel to ensure that adequate lee is provided for safe boarding of the pilot.

5.4 PILOTAGE PASSAGE PLAN

On boarding the vessel, the Pilot shall discuss the Pilotage and Berthing / Un-berthing Plan with the Master. The Pilot and the Master of the vessel will sign the Passage Plan for Inbound or Outbound Passage before the vessel approaches or leaves the berth as per **Appendix 5** or **Appendix 6.**

5.5 TOWAGE

All towage operations within the Port Limits shall be performed by tugs provided by PLL. Towing operations are conducted subject to the terms stated in the **'Conditions of Use'**.

5.6 TUGS AT DAHEJ LNG TERMINAL

Four tugs with Bollard pull of about 65T and one tug of about 60T are available at Petronet LNG terminal. Tugs are made fast using tug rope. Tugs are equipped with 13" maxiflex rope with 44mm wire rope at ship end. Ship to keep heaving lines ready for picking up messenger from tug.

SECTION 6: ENVIRONMENT

6.1 ENVIRONMENTAL CONDITIONS

6.1.1 WIND

The predominant wind direction is south-west and occurs during the period March to October.

6.1.2 RAIN

This part of Indian coast where Dahej LNG Terminal is located experiences two rainy seasons. However, the south-west monsoon contributes about 75% of the average annual rainfall of about 3000 mm. The highest rainfall is reported for the month of June, which often forms about 20 to 25% of the total rainfall.

6.1.3 HUMIDITY

The area experiences high relative humidity. The average relative humidity varies from the lowest of 66% in January to the highest of 88% during July. The daily humidity values do not show any significant or sudden changes.

6.1.4 TEMPERATURE

April and May are the hottest months of the year with a mean maximum temperature of about 40°C recorded. January is the coldest month with a mean minimum temperature of about 13°C.

6.1.5 TIDAL CONDITIONS

Tidal Levels: Important Sea Water Levels are as below: [All levels are related to chart datum (+0.0 m)]

Highest Astronomical Tide (HAT)	: +10.800 m
Highest High Water Spring (HHWS)	: +10.200 m
Mean High Water Spring (MHWS)	: + 8.800 m
Mean High Water Neap (MHWN)	: + 7.100 m
Mean Sea Level (MSL)	: + 5.100 m
Mean Low Water Neap (MLWN)	: + 1.800 m
Mean Low Water Spring (MLWS)	: + 0.900 m
Lowest Low Water Spring (LLWS)	: + 0.700 m
Lowest Astronomical Tide (LAT)	: - 1.000 m

Tidal Current: Strong current up to 5.5 Knots may be experienced in the vicinity of the Terminal during spring tide. The normal direction of tidal current at the berth is along 160°-340° axis.

The tidal range is from 4.5 meters (neaps) to 11.0 meters (springs).

6.1.6 DEPTH AT BERTH

The least depth observed at North and South Berth is CD-14.0 m.

6.1.7 WATER DENSITY

The density of the seawater at LNG Berths is approximately 1018kg/m^3. Water is subject to considerable discoloration due to the presence of particles such as silt from the upriver.

6.2 MARINE ENVIRONMENTAL MONITORING SYSTEM (MEMS)

Dahej LNG Terminal is equipped with MEMS in Jetty Control Rooms of both jetties.

The function of the system is to accurately measure, indicate and record the Wind Speed and Direction, Current Speed and Direction, Wave Height and Period (Short and Long Waves) and Tidal variations with respect to Chart datum.

MEMS is integrated with 'Mooring Load Monitoring System' which facilitates the ship to view environmental parameters in real time mode on Carry-On-Board laptop installed onboard during the stay of the Ship at jetty **(Refer Section 7.5.3)**.

6.3 OPERATING ENVIRONMENTAL PARAMETERS

The following operating weather parameters shall in general account in making any decision on berthing / cargo operation at LNG Jetties.

WIND SPEED AT BERTH (Knots)	WAVE HEIGHT (Meters)	ACTION
Sustained wind >25	**1.20**	**Berthing suspended**
Sustained wind >35 or Significant Movement of Vessel	**1.50**	**Stop Cargo and consider disconnection of arms**
Sustained wind >35	**1.75**	**Consider leaving berth**

- Under normal circumstances berthing will be suspended in sustained wind in excess of 25 knots, or in significant swell/wave height of 1.2 m.
- Whilst moored alongside, disconnection of LNG arms shall be considered in sustained wind speed in excess of 35 knots. Swell / Wave height of 1.50 m or significant movement of the vessel will also necessitate disconnection of the arms.
- Additionally, the terminal shall suspend cargo operation and consider disconnection of arms at any time when the conditions desire after due consultation from Master of LNG Tanker.
- Resumption of cargo operations will take place after the wind speed falls under 35 knots for a period of at least 30 minutes.
- Berthing / un-berthing operation shall be suspended if visibility near berth is less than 1000 m.

The above decision shall be made on the basis of all information available to the terminal concerning:

(a) Prevailing weather
(b) Forecasted weather
(c) Anticipated rate of increase of wind speed and change in the wind direction
(d) Condition of mooring system
(e) Position and movement of vessel
(f) Time to de-ice / drain / purge and disconnect arms
(g) Time to complete cargo operation against risk to vessel remaining alongside / risk of disconnection / reconnection.

In rising winds and sustaining above 35 knots serious consideration must be given to leaving the berth.

6.4 PRECAUTIONS

The Master must be attentive towards the weather forecasts regularly issued.

During the period of a localized electrical storm, cargo operations shall be suspended and all cargo valves closed, ensuring that no pressure build up occurs in the tanks.

The Master is required to ensure that a sharp watch is kept on board the ship for any weather changes, including tide, wind, and swell on the moorings and the cargo discharging operations.

The Master is required to report to the Terminal any potential risk of incident on board the ship that may arise from the prevailing weather conditions.

6.5 STORM WARNINGS

All vessels and Terminal Operators shall observe the requirements of Storm Signals when hoisted. The GMB Port Officer in the event of a severe storm or cyclone promulgates announcements. On receipt of a Storm Warning from GMB Port Officer, Dahej LNG Terminal shall hoist the appropriate signal as per **Appendix 11** of this manual on the JCR Mast.

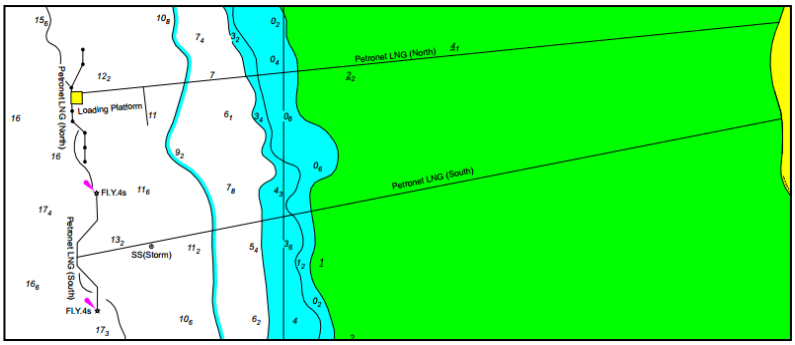
Dahej LNG Terminal shall provide storm signals as warning in extreme weather conditions.

The Terminal provides weather forecast to Ship 24 hours prior berthing during monsoon period.

SECTION 7: PETRONET LNG TERMINAL

7.1 BERTH DESCRIPTION

The terminal jetties are located in southern reaches of the port and provide two LNG berth namely 'North Berth' and 'South Berth'. North Berth can accommodate ship's upto Q-Flex size and South Berth can accommodate ship's upto Q-Max size.



Each LNG Jetty consists of a service platform which is connected to the shore with a trestle of 2.4 km and provides vehicular access (only "intrinsically safe" vehicle authorized by Dahej LNG Terminal can ply on the trestle).

North berth has 5 mooring and 4 breasting dolphins. South berth has 8 mooring and 4 breasting dolphins. Both berths are located in the same north-south line and have a separation of 500 m between them measured vapour-to-vapour. Refer **Appendix 12 & Appendix 13** for Jetty Layout.
Activity: Construction work of 3rd Jetty and two Tug mooring Dolphins to the South of existing South jetty is in progress.

7.2 LNG BERTH PARAMETERS

VESSEL/BERTH CRITERIA	NORTH BERTH	SOUTH BERTH
Maximum Vessel length overall	320 M	355 M
Maximum Allowable Draught alongside	12.7M	12.7M
Maximum Beam	50.0 M	60.0 M
Maximum Vessel displacement on Arrival	1,50,500 MT	1,80,000 MT
Maximum Cubic Capacity (LNG)	2,20,000 m^3	2,70,000 m^3

7.3 FENDERING ARRANGEMENT

(North Jetty)

(South Jetty)

Each LNG Berth has 4 Fenders. One on each Breasting Dolphin. Fender details are as below:

FENDER DETAILS	NORTH JETTY	SOUTH JETTY
Make	Trelleborg	Trelleborg
Type	SUC 2250H(RS)	SCK 2500E2.5
Frontal frame size	6.06 m x 5.04 m	6.10 m x 5.30 m
C/L Height	CD + 9.50 m	CD + 9.50 m
Contact Area	30.5 m^2	32.3 m^2
Reaction Force (Max)	375.2 t	461.6 t
Energy Absorption (Max)	370.0 t-m	506.7 t-m

Appendix 12 and 13 shows location of fenders on each jetty with respect to vapour Line.

7.4 BERTHING AID SYSTEM (BAS)

LNG berth is equipped with BAS.

The system components are Fixed Laser system and Digital Large Display (DLD) unit. On North Jetty DLDs are installed on MD 2 & MD 3, and on South Jetty DLDs are installed on MD3 & MD6. This laser operated system provides both 'Bow' and 'Stern' transverse relative speed of ship, her distance off the berth. The pilot is also provided with handheld unit displaying approach angle, speed and weather parameters.

DLD displays only distance and approach speed.

Berthing speed and Berthing angle of ship from berthing line should not exceed 0.15 m/s and 10 degrees respectively.

7.5 MOORING EQUIPMENTS

7.5.1 QUICK RELEASE MOORING HOOKS (QRMH)

Each Breasting Dolphins (BDs) & Mooring Dolphins (MDs) of the LNG berth is equipped with double hook QRMH assembly and quadruple hook QRMH assembly respectively.

QRMH assembly has a mooring capstan having line handling speed of 22 m/min on North berth and 30 m/min on South berth.

A Load pin is incorporated in each mooring hook for monitoring tension in ship's mooring lines. QRMH can be released locally, manually & remotely from respective Jetty Control Room.

Details of QRMH installed on each jetty are as below:

	NORTH JETTY			SOUTH JETTY		
Rating per Hook	125 T			150 T		
Height (m)	CD +16.0 m			CD +16.0 m		
Dolphin	**No. of Hooks**	**North/South Dist. from Vapour Line (m)**	**Offset from Berthing Line (m)**	**No. of Hooks**	**North/South Dist. from Vapour Line (m)**	**Offset from Berthing Line (m)**
BD 1	2	46.0 North	5.96	2	55.0 South	6.00
BD 2	2	28.0 North	4.96	2	30.5 South	4.73
BD 3	2	38.0 South	4.96	2	30.5 North	4.73
BD 4	2	73.0 South	4.96	2	58.0 North	6.00
MD 1	4	160.0 North	45.00	4	189.1 South	72.70
MD 2	4	115.0 North	45.00	4	164.6 South	75.00
MD 3	4	115.0 South	45.00	4	140.0 South	72.70
MD 4	4	160.0 South	45.00	4	116.1 South	75.00
MD 5	4	205.0 South	45.00	4	116.1 North	72.70
MD 6				4	140.0 North	75.00
MD 7				4	164.6 North	72.70
MD 8				4	189.1 North	75.00

7.5.2 CONSTANT TENSION (CT) SHORE MOORING WINCHES

Hydraulically operated CT winches are installed on both jetties for additional mooring between ship and shore.

(North Jetty)

(South Jetty)

North Jetty has 4 winches, one each on MD1 to MD4. South jetty has 8 winches, one on each mooring dolphin MD1 to MD8.

	NORTH JETTY	SOUTH JETTY
Make	BODEWES Winches	ACE Winches
Capacity	60 T	70 T
Mooring Rope	Aramid, 42 mm x 70 m, 124T MBL	Aramid, 44 mm x 110 m, 159T MBL
Tail Rope	11 m / 22 m Nylon 155 T MBL	22 m Euroflex 225 T MBL
Location of winch on MD	MD1 & MD2 - South of QRMH MD3 & MD4 - North of QRMH	MD1, MD2, MD3 & MD5- North of QRMH MD4, MD6, MD7 & MD8 - South of QRMH

Shore winches are generally kept at a constant tension of 10 - 15 T.

7.5.3 MOORING LOAD MONITORING SYSTEM (MLMS)

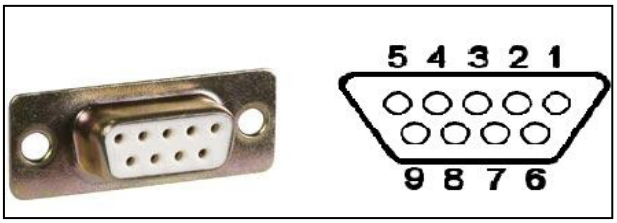
(Carry on Board Laptop)

The Terminal is equipped with MLMS (Manufacturer-Trelleborg) at each jetty. The system components are mooring hook load pins, a Carry-On-Board laptop provided by Terminal (which is connected on board through communication cable for ship to monitor mooring line tensions, **Refer Section 10 Communication**) and a monitor in Jetty Control Room (JCR) with mooring master software.

RS232 D sub 9 pin female serial port (as shown below with pin numbers) is required on ship to connect the shore laptop. Pin nos. 31, 32 & 33 of the Pyle national connector carries the data for the laptop from shore.

If Dsub9 connector is not fitted onboard, then ship can arrange same as per below connections:

Pyle Pin : 31-Com : Dsub pin 5
Pyle Pin : 32-Rx : Dsub pin 2
Pyle Pin : 33-Tx : Dsub pin 3



(Dsub 9 Female Connector)

Ship should have IS Barrier MTL 3058 for receiving MLMS data.

MLMS system has load pins incorporated in to each mooring hook. The laptop when connected on board & a colour monitor in the JCR provides a continuous & constantly updated mooring line tension with visual and audible alarms for overload in each line.

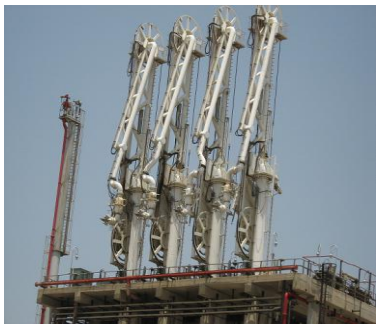
7.6 CARGO TRANSFER EQUIPMENTS (UNLOADING ARMS)

Each LNG berth has 4 set of arms, 3 arms for LNG unloading and 1 arm for NG Loading.

7.6.1 DETAILS OF ARMS

Arms Details	NORTH JETTY	SOUTH JETTY
Make	FMC Technologies SA	FMC Technologies SA
Type	Rotating Counterweighted Marine Arm with Structure (RCMA "S")	Double Counterweighted Marine Arm with Structure (RCMA "S")
Nominal Diameter	16 inches	16 inches
Flange Standard	ANSI 150 FF	ANSI 150 FF
QC/DC	Chicksan	Chicksan
Maximum unloading rate	11000 m^3/hr	12000 m^3/hr
Maximum Vapour Return	12000 Nm^3/hr at -80^0 C	12000 Nm^3/hr at -80^0 C

QC/DC:A hydraulically operated Quick connect/disconnect coupling (QC/DC) is installed on each arm.



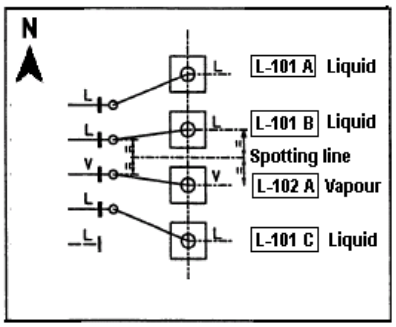
Emergency Release System: Each arm is equipped with a Powered Emergency Release Coupler (PERC) installed between two ball valves. The equipment allows a quick disconnection without draining of the arms first.

Insulating Flange: Each arm is provided with an Insulating flange located at the lower end of outboard arm.

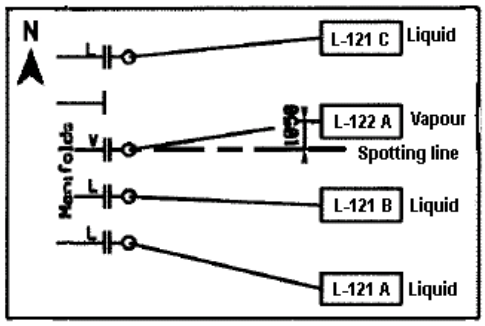
Position Monitoring System (PMS): Each arm is fitted with PMS which is integrated with the ESD and PERC system. The arms when connected to ship's manifold follow her movement and PMS as a safety system for arms, alarms the operator whenever a limit is reached due to excessive movement (Surge/Sway/Drift) of the ship.

Jetty	Arm No. (North to South)	Name	Dist from Vapour Arm (m)	Pressure Ope./Des. (barg)	Temperature Ope./Des. (^{0}C)
North Jetty	101 A	Liquid 'A'	8.60	6.0 / 18.5	-158 / -165
	101 B (Hybrid)	Liquid 'B'	4.30	6.0 / 18.5	-158 / -165
	102 A	Vapour 'V'	0.0	0.1 / 18.5	- 80 / -165
	101 C	Liquid 'C'	4.30	6.0 / 18.5	-158 / -165
South Jetty	121 C	Liquid 'C'	4.30	5.12 / 18.5	-158 / -165
	122 A	Vapour 'V'	0.00	1.05 / 18.5	- 80 / -165
	121 B (Hybrid)	Liquid 'B'	4.30	5.12 / 18.5	-158 / -165
	121 A	Liquid 'A'	8.60	5.12 / 18.5	-158 / -165

Under normal conditions, LNG Tanker's manifold configuration will be as below:



NORTH JETTY



SOUTH JETTY

NORTH JETTY
Port side Alongside: Ship's line No.2 (liquid)/Vapour/No3 (Liquid)/No.4 (Liquid)
(From bow L/V/L/L)
Stbd side Alongside: Ship's line No.1 (liquid)/No2 (Liquid)/Vapour/No.3 (Liquid)
(From bow L/L/V/L)
SOUTH JETTY
Port side Alongside: Ship's line No.1 (liquid)/No.2 (Liquid)/Vapour/ No.4 (Liquid)
(From bow L/L/V/L)
Stbd side Alongside: Ship's line No.1 (liquid)/ Vapour/No.3 (Liquid)/No.4 (Liquid)
(From bow L/V/L/L)

The Terminal staff in conjunction with ship's personnel shall connect the unloading arms.

7.6.2 EMERGENCY SHUT DOWN AND UNLOADING ARM DISCONNECTION

The unloading arms are fitted with emergency shutdown systems (ESD), which can be activated from the MCR or PLC panel at jetty head or automatically when the arms move beyond the permitted ranges. Alarms are set to warn the operators when approaching the limits.

Refer **Appendix 16** for **Arms Operating Envelope of North & South Berth.**

Any significant movement of the LNG Tanker shall immediately be reported to allow early action to remedy the situation. So, a careful monitoring should be done by the LNG Tanker so that early action can be taken to avoid any emergency conditions. In case of emergency situations, all actions shall be taken in conjunction with the **Section 18.2.3 EMERGENCY PROCEDURES**.

ESD limits and Working Envelope of Arms:

North Jetty

Alarm Limits	L-101A	L-101B	L-102A	L-101C
Pre-Alarm (m)	1.0	1.0	1.0	1.0
Extension Step 1 (Deg)	127.5°	127.5°	127.5°	127.5°
Extension Step 2 (Deg)	131.0°	131.0°	131.0°	131.0°
Slew Left /Right Step 1 (Deg)	26.5° / 23.0°	31.5° / 23.0°	12.5° / 27.0°	23.5° / 25.5°
Slew Left /Right Step 2 (Deg)	29.5° / 26.5°	34.0° / 26.5°	16.5° / 29.5°	27.0° / 28.5°
Ht Max / Min (m)	36.20 / 16.85	36.20 / 16.85	36.20 / 16.85	36.20 / 16.85

South Jetty

Alarm Limits	L-121A	L-121B	L-122A	L-121C
Pre-Alarm (m)	1.0	1.0	1.0	1.0
Extension Step 1 (Deg)	125.5°	125.5°	125.5°	125.5°
Extension Step 2 (Deg)	130.6°	130.6°	130.6°	130.6°
Slew Left /Right Step 1 (Deg)	36.0° / 37.1°	34.3° / 23.5°	33.0° / 21.2°	33.0° / 36.5°
Slew Left /Right Step 2 (Deg)	38.5° / 39.3°	36.9° / 26.4°	35.5° / 24.4°	35.5° / 38.9°
Ht Max / Min (m)	36.80 / 16.80	36.80 / 16.80	36.80 / 16.80	36.80 / 16.80

7.6.3 SHORT DISTANCE PIECE & STRAINER

LNG Tanker is required to fit bidirectional conical strainer on the liquid manifolds and Short Distance Piece ANSI 150 FF (16B) on all manifolds with surface roughness of sealing faces and other specifications as provided in **Appendix 17**.

LNG tanker shall also carry spare strainer of required specifications.

7.7 PIPING AND LNG STORAGE

Two 30'' lines along the North jetty trestle and two 32'' lines along the South Jetty trestle are used for transferring LNG unloaded from ship to the storage tanks. Expansion loops are installed along the trestle at periodic intervals in the line. One 10'' line is also provided along respective jetty length for supplying return gas to the ship during unloading operation.

LNG unloaded by ship is stored in the shore tanks the details of which are as below:

No. of tanks :8 (101,102,103,104,105,106,107&108)
Storage Capacity :1, 48,000 m^3 (101,102,103 &104)
1, 70,000 m^3 (105,106,107&108)
Type : Full Containment (above ground)
Height : 55 m
Diameter : 81 m (101,102,103 &104)
85 m (105,106,107&108)

SECTION 8: BERTHING

8.1 BERTHING SCHEDULE

The Berthing schedule and assignment of the ship will be in accordance with the procedures and requirements of Dahej LNG Terminal and shall include but not necessarily be limited to:

- Acceptability of the ship to Dahej LNG Terminal
- Berth availability
- Condition of ship's ballast water tanks on arrival

Berthing schedule and assignment will be notified to the ship by Dahej LNG Terminal with the Terminal operational requirements.
As Dahej is a tidal port and ships are berthed/unberthed during the turn of tide (near slack water), waiting for suitable tide shall not be counted as a part of lay time.
Ships are required to have at berthing, and throughout the stay at the berth, condition which allows safe manoeuvring at all times during discharging operations.
The Master and the Terminal will agree to the final ship position in accordance with the ship and terminal cargo discharging arrangement.

8.2 BERTHING

The Terminal shall take due regard of the existing weather and tidal conditions and determine the optimum berthing disposition i.e. port or starboard side alongside, depending on the circumstances at the time.
During non-monsoon season (16th September to 14th May) ship may be berthed either side alongside depending on the tidal conditions. During monsoon season (15th May to 15th September) ships are normally berthed port side alongside in high water, preferably during morning hours as weather is relatively calmer.
Ships are berthed and unberthed day and night during the turn of tide (near slack water).
The maximum allowed berthing velocity is 0.15m/s and maximum allowed berthing angle from the berthing line is 10 degrees.
If the ship is equipped with Bow Thruster, it will be used while berthing / un-berthing.

8.3 SPECIAL LIMITATIONS FOR Q-FLEX & Q-MAX SHIPS

North jetty can accept only Q-Flex ships with following limitations:

- The Ship to berth during non-monsoon season only.
- The Ship to berth only on low water slack starboard side alongside.
- Berthing / un-berthing: Maximum wind speed 25 knots.
- Alongside: Max current 4.2 knots; Max wind speed 25 knots; Wave negligible.
- Master of the ship to ensure that two independent teams are ready at forward & aft respectively to pass the lines as promptly as possible.

There are no special limitations for berthing Q-flex on South jetty.

Q-Max is acceptable only on South Jetty

SECTION 9: MOORING

9.1 REQUIREMENTS

Master should ensure following:

1) The ship's mooring equipment are in good condition so as to meet the requirement of keeping the ship in a proper and safe position alongside the berth at all times.
2) Mooring lines and tail ropes confirm to OCIMF standards (with respect to material, size, construction and strength) and are used as per the guidelines of the current edition of OCIMF "Mooring Equipment Guidelines" (MEG).
3) The ship is securely moored with due regard to the current weather forecast.
4) Sufficient, competent personnel maintain a strict mooring watch.

Certificates of mooring lines and tail ropes shall be made available to Dahej LNG Terminal on request.

Masters should also ensure that information provided by Mooring Tension Monitor is satisfactory.

9.2 MOORING PATTERN

The normal mooring pattern at the terminal is 4-3-3 (4 headlines / stern lines, 3 breast lines and 3 springs) forward and aft from the ship; however, the Master should not hesitate to increase the number of mooring lines, if he considers it is prudent to do so.

As far as possible wire mooring lines must be used by the ship. Terminal may permit use of HMPE mooring lines provided the lines are of reputed brands and has satisfactory operational history for environmental conditions similar to Dahej.

Ships accepted at Dahej LNG Terminal with HMPE mooring lines, shall have spare HMPE ropes available on board at a location, which allows easy usage of such spare ropes by ship's crew:

Spare HMPE ropes required on board shall be according to following:

1) During monsoon season at least 25% of the total HMPE lines in use.
2) During non-monsoon season at least two HMPE lines.

All HMPE mooring lines shall be used with proper protection at leads/chocks.

Requirement at Dahej LNG Terminal
During monsoon period ship must use 22 meters to 33 meters long mooring tails of Nylon (or other such material having similar characteristics) on Head, Stern & Breast lines and 11 meters tails on the spring lines.

Terminal has constant tension mooring winches installed on both jetties. These are used during the monsoon period, or as and when required. Shore mooring lines cannot be passed as springs and to mitigate strong currents at Dahej, three (3) springs must be passed by the vessel forward and aft.

For ships with lesser number of mooring lines (except spring), best mooring arrangement will be finalized during ship-shore compatibility prior ship's visit.

Appendix 14 shows the "Typical Mooring Patterns" for North and South Berth.

9.3 MARINE CRAFT

One marine craft of 5 T bollard pull is available to assist in the berthing of the ship during non-monsoon period. However, ship lines are passed ashore using heaving lines and messenger lines.

9.4 MOORING PROCEDURE

Pre-Arrival Preparation:

1. Shore side eye of each tail rope should be fitted with jockey strop as shown below.

Practice at Dahej
Jockey strop

Jockey strop (Length not more than1 meter and diameter about 22 mm 3-strand Nylon rope) and the shackle to be provided by the ship and kept ready prior arrival.

Jockey strop to be so attached that they do not slip under load when being pulled ashore. They should be positioned close to spliced end of eye so as to provide a good loop for placing the eye on the mooring hooks.

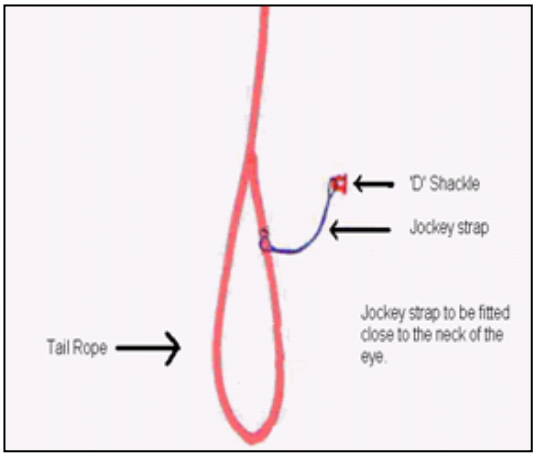
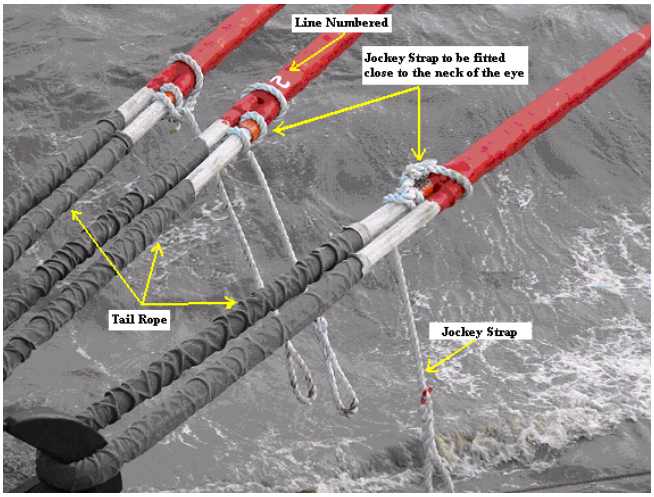


Diagram of Jockey strop



2. For ships with HMPE mooring lines shore can receive 2 lines simultaneously to a dolphin. Ship shall clearly number the outboard eyes of the mooring tails (as shown in picture above). The numbering should be in the sequence of inside-out for each dolphin, starting from innermost line to that Dolphin.

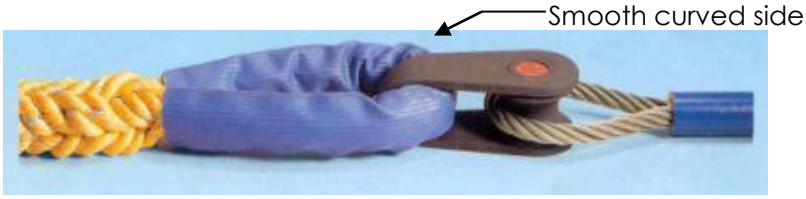
   Numbering will enable the shore crew to identify and match the lines to their respective hooks on a dolphin without error and delay.

3. In order to complete the mooring in a safe and smooth way it is recommended that 2 mooring gangs are kept each forward & aft stations so that the spring and breast line can be sent simultaneously. This will minimize mooring time as slack period is very less and current picks up fast at Dahej.

4. At least three long heaving lines should be available at each fwd & aft stations.

Requirement at Dahej LNG Terminal

Joining shackles on **spring lines** should be such that the smooth/ curved side faces shore. This will prevent the shackle getting stuck at fender chains and dolphins. (See 'Mandal' Shackle picture below)



Joining Shackle (Mandal)

Important: Dahej LNG Terminal recommends the use of appropriate type of Joining shackle (like 'Mandal' or 'Boss' Shackle) for 'Back Springs' so that when rigged in accordance with the manufacturer's instructions, the smooth curve faces shore.

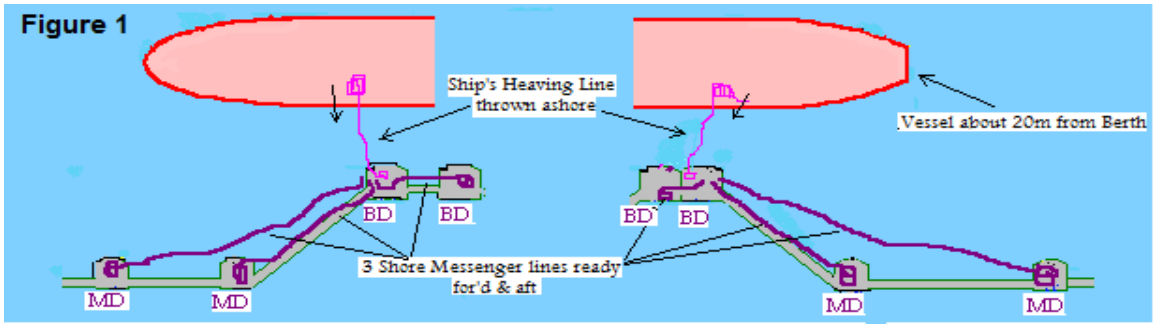
5. First heaving line for taking shore messenger lines from either end should be standby at a position about 50 meters forward and aft of vapor manifold position.

6. Spare mooring ropes to be kept in convenient locations so that they can be immediately passed whenever required.

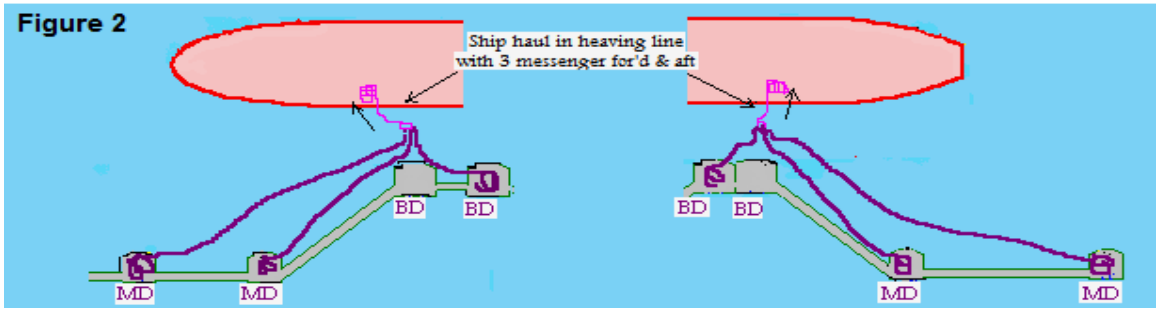
7. Pre-arrival mooring meeting with officers & crew to discuss below procedures.

Step wise mooring Procedure: (All figures assuming berthing port side alongside)

1. Ship to send one heaving line from fwd & one heaving line from aft to shore breasting dolphins when the vessel is about 20 meters from berth. (Figure 1)



2. Shore will connect 3 messenger lines (each for spring lines, breast lines and head/stern lines) to each heaving line and ship will haul in the heaving line with 3 messengers fwd & aft from shore. (Figure 2)



3. Ship to connect eye of messenger, eye of jockey strop and eye of heaving line using a D-shackle and pass ship's line one at a time in case of wire moorings line and two lines at a time in case of HMPE moorings line. Shore will have mooring crew standby at all the dolphins. For ship's with wire mooring lines shore can receive one spring line, one breast line, one head/stern line simultaneously fwd & aft. (Figure 3 & 4)

   For Ship's with HMPE mooring lines shore can receive two spring line, two breast lines, two head/stern line simultaneously fwd & aft.

Figure 3

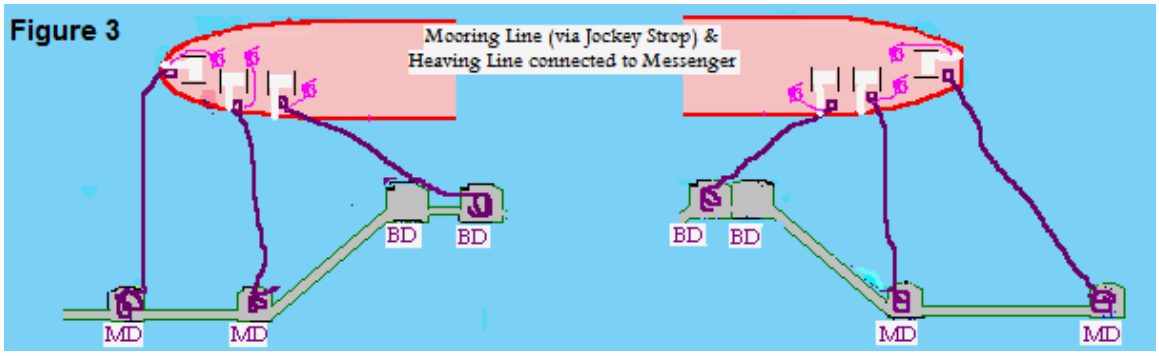
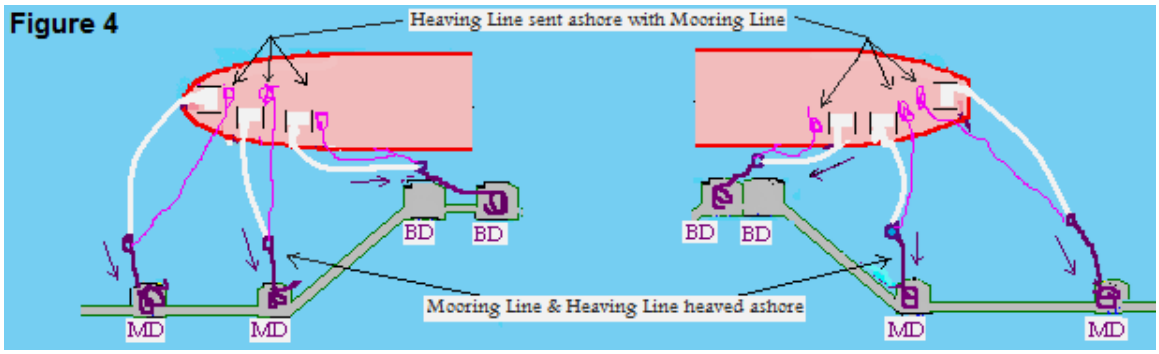


Figure 4



Important:

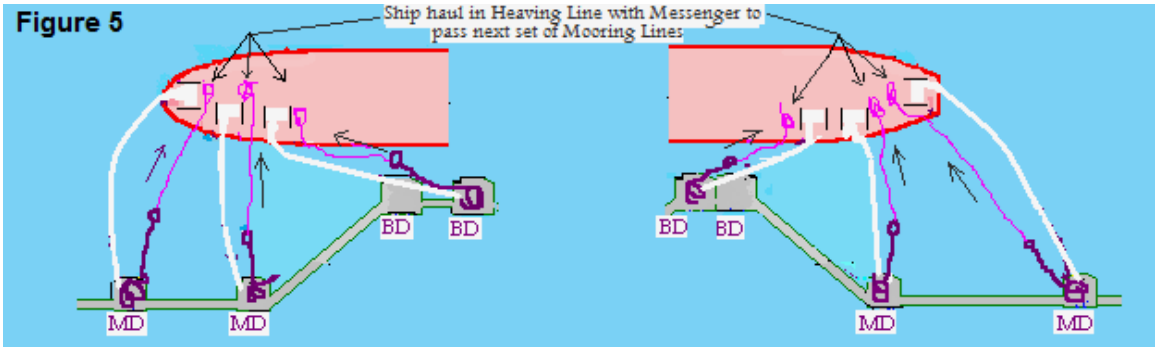
a) Heaving line should be passed along with ship's line every time for taking back shore messenger line for passing the next line. Heaving line should also be passed along with the last breast/ head/ stern line for taking shore mooring rope. (Figure 4)

Practice at Dahej

Ships using HMPE mooring lines are required to use sleeves on these lines at leads/chocks.

b) Sleeves on HMPE mooring lines shall be applied one by one in consultation with the Pilot during mooring or just after completion of mooring.

4. Once eye of the tail rope is put on the shore mooring hooks, shore mooring crew will disconnect the jockey strop and ship's crew shall then haul in the messenger using the heaving line for passing the next line. (Figure 5)



5. Step 3 & 4 to be followed till all the lines (including shoreline where applicable) from each lead (spring, breast, head/stern) is passed across.

6. Ship will be positioned after passing two spring lines each fwd & aft. During this time other lines (Breast, Head/Stern) should be passed but should not be tightened.

7. Ship's officer at mooring station should use their best judgment and transfer the mooring line to split half and avoid slackening of the lines for transferring line to split half after the ship is positioned. In past it is observed that the ships have moved from the spotting line while transferring the mooring line to split half. It is very difficult & time consuming for repositioning the ship once tidal current picks up.

8. Ship is requested to keep the mooring line just above water level for easy & quick handling of lines during mooring. This will facilitate shore crew in putting the eye of the tails on to shore mooring hooks quickly and reduce mooring time. In case where two mooring lines are passed at a time (for HMPE lines), the lines should always be kept above water when being sent ashore till they have been put on the shore mooring hooks.

9. Sequence of passing lines: In general, Inner most line to be passed first & outer most line to be passed last at each forward & aft station. For headlines and stern lines sequence may vary from above, wherein such cases sequence shall be advised by the Pilot prior mooring operation. Shore line will be passed after passing all ship's line.

10. For the safety of shore mooring crew working in the vicinity of lines and for easy handling of lines, it is recommended to tighten the lines on one particular dolphin (breast lines, head/stern lines) after all lines to that dolphin is passed. Slack should be picked up from each line after the line is put on the mooring hook and should be tightened together.

11. Ship should haul in the shorelines from the respective dolphin at the same time when their last line is being passed ashore to that dolphin. Ship should haul in the shorelines at slow speed as the shore constant tension winches are designed for slow payout of rope.

9.5 TENDING MOORING AND PRECAUTIONS ALONGSIDE BERTH

1. Ships fitted with self-tension mooring winches must have these on manual control while at the berth.

2. Ensure mooring loads of 15 - 20 MT evenly on all the lines (except back springs) at all times during the ship's stay alongside.

   Back springs forward or aft, depending on the state of tide (flood or ebb tide), may have significantly higher or lower tensions. Prior tending the back springs, permission should be sought from the Pilot or PLL representative. Ship position should be carefully monitored while tending the back springs.

3. Weather forecasts should be monitored during the ship's stay alongside and appropriate action taken in advance of deteriorating weather.

4. In view of the high tidal range prevailing at Dahej, Masters are required to ensure frequent tending to the mooring.

5. A strict deck watch must be kept on the ship's moorings. Mooring lines must be tended so as to prevent undue movement of the ship, taking in consideration tidal effect, weather changes and the ship' condition.

6. It is Master's responsibility to keep the vessel in position all the time within the surging and swaying limits as determined during ship-shore compatibility and mooring studies. This will be discussed at the pre-discharge meeting. However, a close watch on vessel movement will be maintained from shore as well and information regarding any undue movement of the vessel will be exchanged. In case of activation of pre-alarm of unloading arms (as defined in section 7.6.2), vessel will be repositioned by tending the moorings and use of tugs. Prior to any such repositioning of the vessel the terminal will engage with the vessel's master and review the need to stop cargo and/or disconnect.

Masters are cautioned that there is little or no slack water & close attention to moorings must be given at change of tide and during the first three hours of the flood tide.

Ship is required to maintain hourly Log of Tension in each of the ship's rope in the format provided by the Terminal.

SECTION 10: COMMUNICATION

10.1 LANGUAGE

All communications, whether verbal or written shall be in the English language.

10.2 COMMUNICATION AT BERTH

The following links are available for ship-shore communication at berth.

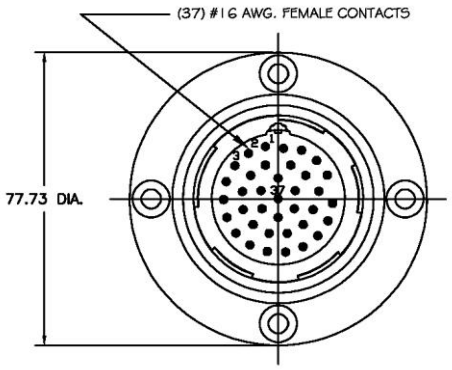
	NORTH JETTY	SOUTH JETTY
Electrical link	Yes	Yes
Fiber-Optic link	Yes	Yes
Pneumatic link	Yes	Yes

The above links will enable following communication:

	FUNCTION
Electrical link	ESD, Telecommunication & Mooring Tension Monitor
Fiber-Optic link	ESD, Telecommunication & Mooring Tension Monitor
Pneumatic link	ESD

Primary means of communication between the ship and terminal will normally be through an Electrical link on North Jetty and Fiber-Optic link on South Jetty. Link will be connected by the terminal as soon as the gangway has been set and will be removed just before the gangway is removed prior ship's departure.

In the event of a failure of the Electrical/Fiber-Optic link, all discharging operations to be suspended until the link is re-established, or until such time an alternative link as agreed is established between the ship and the terminal.



37 Pin Pyle National Connection

A VHF channel is also available for ship-shore verbal communications.

10.3 DETAILS OF ELECTRIC LINK AND FIBER-OPTIC LINK CONFIGURATION

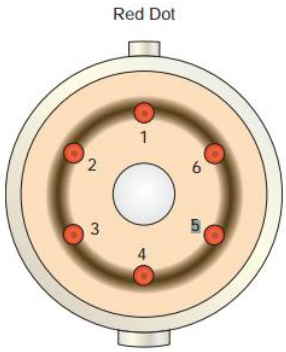
(i) Pyle-National electric link connector configuration

PIN No.	USE	REMARKS
5 & 6	Hotline	Voltage level 18VDC (Shore has Dial-less SeaTechnik CTS-HP-3 Phone)
9 & 10	EPABX (Telephone)	Voltage level 48VDC (when ringing)
13 & 14	ESD	Shore to Ship
15 & 16	ESD	Ship to Shore
17 & 18	Umbilical Continuity Link	On ship, Continuity required for Hotline & EPBAX
19 & 20	Umbilical Continuity Link	On ship, Continuity required for Hotline & EPBAX
31, 32 & 33	Mooring Load Monitor (Terminal connects Laptop onboard for this)	Ship should have IS Barrier MTL 3058 for receiving MLM data. (Refer Section 7.5.3 of this manual)

Ship's Pyle pins should be configured as per the above table.

(i) Fiber-optic link connector configuration for North and South Jetty

Core	USE	REMARKS
1	Tel Channel	Ship to Shore
2	Tel Channel	Shore to Ship
3	ESD Channel	Ship to Shore
4	ESD Channel	Shore to Ship
5	Spare	Ship to Shore
6	Spare	Shore to Ship



10.4 SHIP-SHORE ESD LINK

Primary ESD link : Electrical / Fiber - Optic
Secondary ESD link : Pneumatic

Details of Electric, Fiber-Optic and Pneumatic ESD at Dahej LNG Terminal is as follows:

Electric ESD

Connector type : 37-Way Pyle National Connector
Connection Box position : Main jetty under unloading arms
Pin allocation : Pin No 13 x 14 - ESD shore to ship
Pin No 15 x 16 - ESD ship to shore
Cable length : 50 m

Fiber-Optic ESD

Connector type : 6-Way Fiber-Optic Connector
Connection Box position : Main jetty under unloading arms
Core allocation : Core No 3 - ESD ship to shore
Core No 4 - ESD shore to ship
Cable length : 50 m

Pneumatic ESD

Manufacturer : NITTA MOORE
Connector type : QDCH8-NITTA ½"
Connection Box position : Main jetty under Un-loading arms
Air pressure (Normal/ Trip) : Normal - 5.5 bar, Trip - 2.1 bar, Reset - 2.12 bar
Pneumatic hose length : 50 m

10.5 COMMUNICATION AGREEMENT

The **"Communication Agreement"** as per **Appendix 9** shall be completed and signed by the Master during the Pre-Discharging Meeting.

Verbal and written communication between the ship and the terminal must be in the English language.

Verbal messages between the ship and the terminal must be read back to ensure concise communication.

SECTION 11: SHIP AND TERMINAL ACCESS

11.1 GANGWAY ARRANGEMENT

The Terminal gangway will be the designated access way used, unless previously agreed by the ship and the terminal. All personnel shall use only that designated access.

The ship must be ready to receive the terminal gangway as soon as the berthing has been completed.

The Master responsibilities are:

1. To provide assistance on the main deck to enable the proper and safe positioning and removing of the terminal gangway on board the ship.

2. To position a lifebuoy with at least 25 meters of lifeline on the ship's main deck and close to the gangway.

3. To ensure proper illumination of the gangway landing area.

4. To ensure notices and information are displayed at the gangway access area as required under the relevant Terminal Regulations.

Use of the terminal gangway shall not preclude the responsibility of the Master to provide safe access to the ship.

Any gangway provided by the ship should confirm to the terminal requirements with correctly rigged rails, embarkation steps, safety net, and appropriately positioned lifebuoy.

11.2 TERMINAL GANGWAY DETAILS

The Jetties are installed with tower type gangway with telescopic ladder arrangement. Working details of gangway are as below:

	North Jetty	South Jetty
Manufacturer	Verhoef Access Technology, Netherlands	Samgong Co. Ltd, Korea
Working range	CD + 9.00 m (Minimum) CD + 34.00 m (Maximum)	CD + 9.00 m (Minimum) CD + 34.00 m (Maximum)
Slew allowance	4.60 m forward & aft	6.00 m forward & aft
Dist. from Vapour line	31.95 m South	23.80 m North
Landing area	0.957 m x 1.500 m = 1.43 m^2	1.0 m x 2.0 m = 2.00 m^2

The Gangway has a "Free-Wheel" mode which facilitates it to follow all the movements of the ship automatically.

Refer **Appendix 12** for location and **Appendix 15** for operating limits.

11.3 SHIP ACCESS

The Master has the sole authority on access to the ship.
Dahej LNG Terminal reserves the right to escort to or from the ship unannounced visitors or persons whose conduct presents a hazard to personnel or Dahej LNG Terminal property.

Dahej LNG Terminal reserves the right to board the ship at any time to ensure that the present regulations are being observed, and to stop all operations in the event of contravention of the present regulations.

11.4 TERMINAL ACCESS

Dahej LNG Terminal has the sole authority on access to the berth area.

Special authorization for service vehicles which are "intrinsically safe" complying with the safety requirements of the terminal may be granted by Dahej LNG Terminal utilizing the Permit to Work system.

Personnel access from the terminal area to ship or from the ship to the terminal is strictly controlled and subject to prior approval from Dahej LNG Terminal.

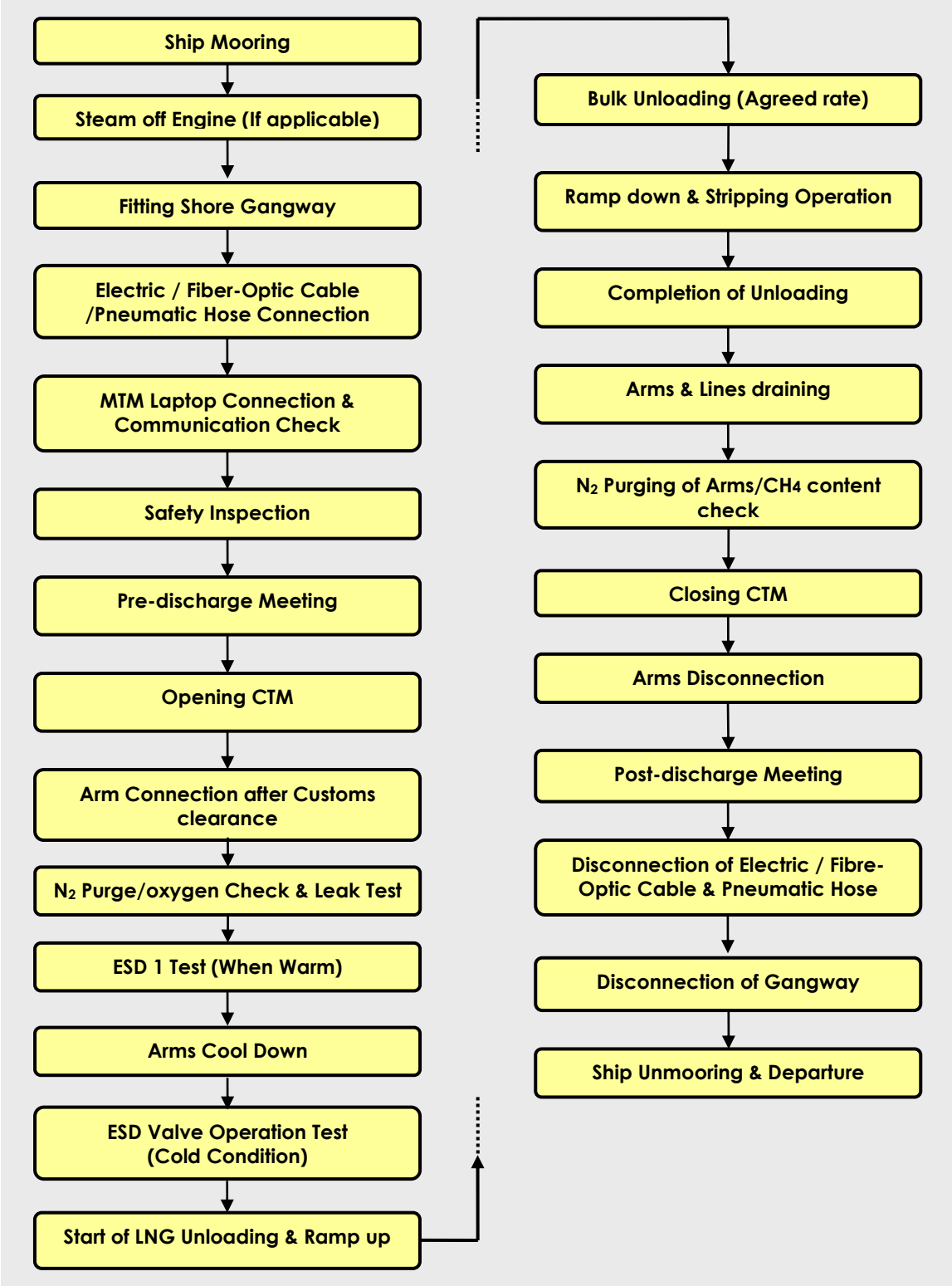
11.5 EMERGENCY ESCAPE

Accommodation ladder shall be rigged on the sea side of the ship ready for immediate lowering in the event of an emergency.

The offshore lifeboat, if fitted, shall be lowered to embarkation level or be ready for immediate use at all times.

SECTION 12: CARGO OPERATION

12.1 SEQUENCE OF OPERATION: A typical Sequence of Operation at Dahej LNG Terminal is as beow:



Ship shall communicate the time of completion of each sequence as per **Appendix 10** '**Tanker Time Sheet'** to Jetty Control Room & PLL representative on board.

12.2 CARGO DISCHARGING AGREEMENT

The procedures for the intended cargo discharging must be pre-planned, discussed and agreed by the terminal and the Master prior to the start of operations.

12.3 CONTROL AND SUPERVISION

All shipboard cargo discharging operations must be competently and constantly supervised on board the ship. A designated responsible person or persons shall be appointed by the Master to supervise such cargo discharging operations. The persons(s) so appointed shall maintain communications with the Master and the Terminal.

12.4 SHIP / SHORE MEETING

A Pre-Discharging and Post-Discharge Meeting will be held on the ship which will be attended by the PLL representatives and the designated responsible person(s) appointed by the Master to supervise the cargo discharging operations on the ship.

12.5 ARMS CONNECTION

Arms connection shall commence after the vessel and cargo is cleared for discharging by customs authority.

Discharging LNG from the ship will normally be carried out through three liquid Un-loading arms on the berth; any deviation will be discussed in the Pre-Discharge meeting.

Boil-off vapor requirement for the ship's cargo tanks will be sent through a dedicated vapor return arm, which will be connected prior to the liquid unloading arms.

The Master is required to ensure that the ship's manifolds and water curtain are ready prior to berthing of the ship alongside the terminal.

After connection of the unloading arm the water curtain system of the ship may be started in consultation with the terminal.

12.6 NITROGEN PURGE AND LEAK CHECK

After the unloading arms are connected to the ship's manifold, terminal will purge the unloading arm with N_2. After purging, leak test will be carried out (applied pressure 5-6 barg for liquid and 1.5 - 2 barg for vapour line) to check the integrity of the unloading arm flange connection point.

Ship may have to provide N_2 for leak test in case required by the Terminal.

12.7 SHIP AND SHORE ARM COOLING

Ship to berth at Dahej with cargo deck lines in cool down condition. In view of CTMS requirements main cargo line should be drained back to tanks at least 30 minutes prior CTMS. Unloading arms cool down is started immediately after successful completion of ESD test. The cool down of unloading arms normally takes 90-120 minutes. Ship is required

to regulate LNG flow as per the requirement of terminal during cool down. Terminal can handle LNG cargo within temperature range of -158 Deg C and -162 Deg C.
Ship shall arrive terminal with lowest cargo tank pressure, preferably less than 12 kPa. Terminal can handle maximum pressure of 15 kPa inside ship's cargo tanks. The rise in tank pressure during ESD and unloading arms cool down should be minimal. However, if the pressure rises, gas burning may be required, for the shortest duration because **Dahej LNG Terminal cannot receive vapours from the ship as the terminal does not have any arrangement to consume Boil Off Gas**. Terminal will not be responsible for the commercial impact due to this safety requirement.

12.8 CARGO MEASUREMENTS

The Master is required to conduct initial and final gauging of the ship's cargo tanks prior to start and after completion of cargo discharging operation respectively.

Verification of the accuracy of the CTMS shall be carried out prior opening CTM.

Ship, PLL and the Independent Surveyor shall attend both initial and final gauging.

Gauging shall be conducted immediately after the Opening meeting and disconnection of the unloading / loading arm and upon the ship's confirmation of the following:

1. All compressors stopped.
2. Spray pumps /Fuel Gas Pump stopped.
3. Gas master valve to the boilers/engines closed.
4. Readings on the flow meter for gas to engine room logged down.

For vessels equipped with GCU, readings on the flow meter for gas sent to GCU logged down.

The cargo lines to be drained before final gauging of the ship's cargo tanks.

12.9 VENTING

Venting cargo vapor to the atmosphere is not permitted. The Master is required to report to the Terminal and take all necessary action to prevent accidental venting.

In the event of an emergency situation during which venting occurs, cargo discharging operations will be immediately stopped.

12.10 CARGO MACHINERY CONDITION

The Master is required to ensure that all ship's equipment used in cargo discharging operations is properly manned and maintained in a satisfactory manner throughout the cargo discharging operations. Any defect or deficiency, which would impair the safety or the efficiency of the cargo discharging operations, must be immediately reported to the Terminal.

12.11 DISCHARGING START-UP / STOPPAGE

All start-up and stoppage of the cargo discharging operations will be at the Master's discretion.

The Terminal reserves the right to delay the discharging start-up or to require the discharging to be stopped at any time due to terminal operational requirements.
The Master is required to provide reasonable notice to the terminal for any changes or requirements, which may affect the cargo discharging operations. This does not change the Master's authority to deal with emergency situations.

Terminal will provide reasonable notice to the Master for any changes or requirements, which may affect the cargo discharging operations.

12.12 DISCHARGING RATES

The Master and the Terminal will monitor the discharging rate during the initial stages of cargo discharging operations. The discharging rate changes shall be as agreed during Pre-Discharge meeting.

The maximum allowed unloading rate by the terminal is 11000 m^3/hr at North Berth and 12000 m^3/hr at South Berth.

Maximum vapour return flow rate from the terminal is 12000m^3/hr. Ship shall start its vaporizer in case additional vapour is required to maintain her tanks pressure.

12.13 DRAINING AND PURGING

Draining and purging of shore arms shall be as per the agreement during ship-shore pre-discharge meeting.

12.14 ARMS DISCONNECTION

The liquid and vapor arms shall be required to be purged and inerted with nitrogen by ship prior to disconnection.

The Master is required to ensure that the ship's manifolds and cargo lines are ready for purging, inerting and disconnecting operations.

The liquid and vapor arms will be disconnected and stowed one by one by the terminal. The Master is required to provide assistance from his crew on the ship's manifold for communication purposes with the terminal during arms disconnection and maneuvering.

12.15 DRUGS / ALCOHOL ABUSE

If at any time, Dahej LNG Terminal detects or has reason to suspect that the Master or any crew member is under the influence of drugs or intoxicating liquor, the unloading operation will be suspended immediately for further actions.

Discharging operations will remain suspended until such time as the terminal is satisfied that they may be safely resumed.

SECTION 13: ALONGSIDE BERTH

13.1 STATE OF READINESS

13.1.1 STABILITY

The Master is required to maintain appropriate trim and list and to retain sufficient positive stability to enable safe cargo discharging operations and emergency un-berthing.

13.1.2 DEFECTS AND DEFICIENCIES

Any defect or deficiency occurring in the ship's manning, or equipment during the cargo discharging operations must be immediately reported to the terminal.

13.1.3 REPAIRS AND MAINTENANCE

Any repair or maintenance work (either cold or hot) which would impair the safety of the cargo discharging operations or the maneuverability of the ship is strictly prohibited. Exceptional authorization may be delivered in writing by the terminal.

Such exceptional authorization will not be granted during cargo discharging operations. It will only be considered where unavoidable repair / breakdown occurs and may be conditional on the Master requesting sufficient standby tugs to move the ship if so required. Should immobilization as above occur and prior approval from the Master has been impossible, Terminal reserves the right to order' tug(s) as above on the Master's behalf.

13.1.4 CREW READINESS

Sufficient crew must remain ready on board the ship at all times to ensure the proper discharging of operations and to face any emergency situation that may occur.

13.1.5 ENGINE READINESS

Boilers, main engines, steering machinery and other equipment essential for manoeuvring must be maintained so as to enable the ship to be un-berthed under her own engine power at short notice in case of emergency.

13.1.6 EMERGENCY TOWING WIRES

Rigging of Emergency towing wires is not mandatory at Dahej LNG Terminal.

13.2 JETTY OPERATION

13.2.1 DECK WATCH

At least one of the ship's officers shall be on deck, or in the cargo control room, at all times and there should be sufficient crew members on deck to ensure the safe operation of the ship. A manifold watch, in radio contact with the cargo control room or Deck officer, shall be maintained at all times.
Regular safety-rounds should be taken by the crew on deck, cargo-room and all the important parts of the ship to ensure her safety in the terminal.

13.2.2 TUG STANDBY

In high wind / sea conditions, and should circumstances dictate, sufficient tugs shall be placed on standby in close proximity to the LNG Berth in case of emergency.

13.2.3 RADAR

The use of ship's radar during cargo operations is strictly prohibited without authorization from the terminal.

13.2.4 TRIM

Ship should at all times keep trim to a minimum. Excessive trim can be a cause for concern in strong tidal currents.

13.2.5 FUNNEL EMISSIONS

Soot blowing is not permitted whilst the ship is moored alongside the berth. The emissions should fully confirm to the MARPOL standards.

13.2.6 SWIMMING AND FISHING

Swimming or fishing is not permitted by the terminal while the ship is alongside or berthing / un-berthing. No crewmember of the ship should indulge in swimming or fishing.

13.2.7 LIGHTING

During darkness, adequate lighting should be arranged to cover the deck areas and in particular the manifold area.

13.2.8 STORING

Storing (of Spares, provisions etc.) should not take place during the cargo operation. Prior approval from the terminal is required for taking stores, spares & provisions etc. Support crafts should be avoided for taking stores, spares & provisions while the ship is at LNG berth or berthing/un-berthing, during Pilotage or any operation concerning the ship is taking place.

SECTION 14: SAFETY, SECURITY AND POLLUTION CONTROL

14.1 SAFETY

14.1.1 PERSONAL INJURY PREVENTION

The following protective equipment is to be worn at all times in LNG berth area:

Safety Helmet, Safety Shoes, Protective Goggles, Protective Gloves & Protective anti-static clothing.

The Master is required to ensure that his crew wears appropriate Personal Protective Equipment (PPE) at all times on the ship and in the berth area.
The following protective equipment is to be readily available in sufficient numbers on the ship:

- Fire-fighting personal equipment, including self-contained breathing apparatus
- PPE

Medical assistance and equipment must be readily available and displayed on the Ship to deal with personal injuries.

14.1.2 SHIP/SHORE SAFETY CHECKLIST

Prior to the commencement of operations, responsible officer from Dahej LNG Terminal boards the vessel and along with responsible ship's officer performs safety tour inspection on deck and later completes the **'Ship/Shore Safety Checklist' (SSSCL)** as per **Appendix 8.**

Regular checks at specified intervals not exceeding 4 hours shall be conducted and endorsed by the relevant parties. Any conditions that may change during the operation and which may lead to unsafe conditions shall be brought to the attention of the relevant party and rectified. This may necessitate suspension of cargo operations until the situation is rectified.

14.1.3 FIRE PREVENTION ONBOARD & ON BERTH

The Ship's Master is strictly required to comply with the requirements of Ship/Shore Safety Checklists so as to prevent any kind of Fire on Board and on Berth.

SMOKING

Smoking on the berth area is strictly prohibited. Smoking on board the Ship is only authorized in the designated areas, unless previously agreed during the ship / shore Pre-Discharging Meeting. Smoking and non-smoking signs shall be displayed on board the ship on arrival under the Master's authority.

HOT WORK

Hot work including hammering, chipping, and operations involving the use of any power tools are prohibited on board the Ship, unless a written agreement has been issued by Dahej LNG Terminal.

MOBILE PHONES, SMART WATCHES & PAGERS

The use of Mobile telephones, Smart watches and pagers is prohibited in the vicinity of the terminal and in the ship's hazardous areas. Mobile telephones, Smart watches and pagers may be used on board ship inside the accommodation area with the Master's permission.

14.1.4 ENGINE SAFETY (In case of Steam Ships)

No loading arms may be connected until the ship reports that the steam supply to the main engine is secure and the turning gear is engaged.

Similarly main engine warm up prior to un-berthing may not commence until all loading arms are clear of the ship except using warm up system which is to the satisfaction of Terminal Safety Regulation.

14.1.5 SUSPENSION OF OPERATIONS

Cargo operations shall be halted during any period of severe or abnormal conditions or when required by conditions stated in **Section 6.3** of this manual which endangers the safety of the Ship and the terminal facilities.

The loading arms shall be disconnected, and preparations made for the ship to vacate the berth should it become necessary. All actions to be taken in conjunction with the Emergency Procedures described in **Section 18** '**Emergency Procedures'.**

14.2 SECURITY

14.2.1 NO UNAUTHORISED PERSONS

PLL requires that no unauthorised persons board Vessels within the Port Limits. Masters are required to check the identity of all persons boarding their vessel. A gangway watch shall be maintained at all times by competent shipboard personnel and any unauthorised attempt to board the ship shall be reported immediately to the terminal.

Prior to the ship's arrival, terminal provides a boarding list to her on email. All terminal personnel wear terminal photo identity proofs at all times.

14.2.2 NO UNAUTHORISED CRAFT ALONGSIDE

No unauthorized crafts are allowed alongside the vessel whilst she is in Dahej Port Limits without permission of the terminal. It is the duty of the vessel to ensure that such craft do not come or remain alongside.

14.2.3 LIFEBOAT LOWERING

Lifeboats must not be lowered into the water except in an emergency with the permission of the terminal.

14.2.4 SECURITY PATROL CRAFT

Whilst the Vessel is berthing/alongside/un-berthing, PLL designated Security Guard Boat by way of Tugboat or Patrol Boat "Sea Care 1" shall patrol the Dahej LNG Terminal Area.

Patrolling is done by Tugboat or marine craft, that remain standby during the ship berthing/ un-berthing and during her entire berth stay.

14.3 POLLUTION CONTROL

14.3.1 LOCAL CONDITIONS

The waters in and around the terminal are renowned for their abundant marine life and there is an increasing awareness of the environment in the Dahej area. Any pollution affecting the well-being of the area is looked upon seriously and heavy penalties will be incurred, in addition to any clean-up costs.

14.3.2 SEA AND OVERBOARD DISCHARGE VALVES

Overboard discharge valves on the bilge and cargo systems shall be firmly closed and locked. Where the indicated valves are hydraulically powered then a suitable means of preventing accidental operation shall be arranged.

During the vessel's stay in the Port all overboard discharge valves shall be monitored to ensure that no polluting substances are released.

Water discharges (e.g., cooling water) shall not be directed onto or over the jetty or dolphins. Where this cannot be achieved mechanically then suitable baffle boards shall be rigged to the satisfaction of Dahej LNG Terminal.

14.3.3 OIL TRANSFER

Whilst within the Port Limits the internal transfer of any oil or slops is not permitted without the approval of the terminal.

14.3.4 BILGE DISCHARGE

The discharge of bilge effluents, oil, or any mixture containing oil to sea is strictly prohibited.

14.3.5 LEAKS AND SPILLAGE PREVENTION

A sharp and appropriate look-out must be kept on board the ship to prevent leaks or spillage during cargo discharge.

Drains on the ship's discharging manifolds must remain plugged during cargo discharging operations.

14.3.6 POLLUTION

In the event that pollution, on the land or within the waters of the Port Limits occurs, regardless of cause or origin, the person in charge of or responsible for the operation, works or location where such pollution occurs, shall immediately report the incident to the Main Control Room (MCR) and Jetty Control Room (JCR) by the most expeditious means and it should be confirmed that the information of the incident has been received by the MCR and JCR.

Any action taken should be in conjunction with the Oil Spill Contingency Plan.

Failure to report a pollution incident is a serious offense and persons found contravening this requirement will be liable to heavy fines and prosecution in Indian courts.

SECTION 15: DOCUMENTATION

15.1 PORT DUES (PD), MARINE AIDS TO NAVIGATION DUES (MAN) & VTS FEES

PD, MAN & VTS Fees are set by the Authorities & the ship owner / charterers are responsible for the due settlement of such charges. These charges, which are liable to change from time to time, should be confirmed with owner's local agent.

15.2 CUSTOMS AND IMMIGRATION

Customs and Immigration Officers will normally board all vessels on arrival at the berth. The CHA will be responsible for making the required arrangements. Documents required are as below:

a) Last Port Clearance – Original

b) **Three Copies** of the following documents:

- Ships Particulars,
- Cargo Manifest,
- Summary of Ports called in last 10 voyages,
- Maritime Declaration of Health,
- Vaccination List,
- Personal Property Declaration List,
- Crew List,
- Currency List (Ships and Crew),
- Store List,
- Bonded Stores List,
- Narcotics List,
- Nil List,
- Load Port Cargo Survey Report,
- Protest Letter, if any, pertaining to Cargo

c) **Three Copies** of the following certificates:

- Certificate of Ships Registry
- Cargo Ship safety equipment Certificate
- International Load Line Certificate,
- Cargo Ship Safety Radio Certificate,
- Cargo Ship Safety Construction Certificate,
- IOPP Certificate,
- Deratting Exemption Certificate,
- International Tonnage Certificate

15.3 HEALTH

The Government Health Authorities will grant free pratique. PHO boards vessel coming from Yellow fever risk area. The owner's agent will be responsible for making the required arrangements.

One copy of the following documents:

- Maritime Declaration of Health
- Vaccination list
- De-ratting Exemption Certificate

SECTION 16: SERVICES & WASTE DISPOSAL

16.1 CREW CHANGE

Crew change permitted provided it is arranged through ship owner's agents well in advance. Ship owner's agents to take all necessary permissions including permission from the Terminal. Terminal Safety & Security Regulations are applicable to all persons entering the Terminal premises.

16.2 SHORE LEAVE

Terminal allows shore leave provided permission for same is obtained from Customs and Immigration/Police by Ship's agent.

16.3 PROVISIONS AND SPARES

Provisions and spares may be taken on board at the jetty but should not be done when cargo operations are taking place. LNG Tanker shall take prior approval from the terminal for taking stores, provisions etc. and all arrangements shall be made through the agent without delaying the ship schedule.

16.4 BUNKERING & FRESH WATER FACILITIES

No facilities for the supply of bunkers & fresh water are available at the terminal.

16.5 MEDICAL SERVICES

Medical services are available through the owner's agents at Bharuch City. In all cases the Terminal must be informed.

Limited facility for emergency medical treatment is available at the terminal occupational Health Centre(OHC).

16.6 WASTE DISPOSAL

Waste disposal facilities exist at terminal through GMB authorized and approved vendors. Vessels desiring to land waste should request the ship's agent to arrange for same through GMB approved vendors.

The applicable rates for waste removal service can be obtained from the vendor through the ship's agent. Permission for disposal must be sought from Head Port Operations and customs.

The disposal of waste must not be carried out during cargo transfer operations.

All vessels calling Indian Ports are required to access Swachh Sagar Portal on DG shipping website and raise **Advance Notification Form (ANF).** Raising of ANF by visiting vessels is mandatory irrespective of whether ship is using reception facility or not. **ANF can be raised** by Ship Master or their agents.

SECTION 17: CONTACTS

17.1 PORT AUTHORITY

Name : Gujarat Maritime Board (GMB)
Contact Person (Title) : Port Officer
Address : Gujarat Maritime Board
Office of the Port Officer Dahej
B/S Hotel Plaza, Near Taluka Panchayat,
Station road, Bharuch-392001(Gujarat)
Telephone : +91 (0) 2642 220377/241772 (Office),
Fax : +91 (0) 2642 243140

17.2 PETRONET LNG TERMINAL

CONTACT PERSON FOR SHIP-SHORE CORRESPONDENCE

Name : Amit Kumar Ashat
Title : **Head,** Port Operations
Address : GIDC Industrial Estate, Plot No.7/A,
Taluka: Vagra,
Distt: Bharuch (Gujarat) 392130.
Telephone : +91 (0) 2641 670291 (Office), +91 (0) 9662526288 (Mobile)
Email : amitashat@petronetlng.in, shipping@petronetlng.in

17.3 'PORT FACILITY SECURITY OFFICER' (PFSO)

PORT FACILITY NAME : DAHEJ LNG TERMINAL
PFSO Name : Amit Kumar Ashat
Title : **Head,** Port Operations
Address : GIDC Industrial Estate, Plot No.7/A,
Taluka: Vagra,
Distt: Bharuch (Gujarat) 392130.
Telephone : +91 (0) 2641 670291 (Office), +91 (0) 9662526288 (Mobile)
Email : amitashat@petronetlng.in, shipping@petronetlng.in

SECTION 18: EMERGENCY PROCEDURES

18.1 TERMINAL INFORMATION AND SAFETY REQUIREMENTS

THE FOLLOWING TERMINAL INFORMATION SHOULD BE MADE AVAILABLE TO ALL PERSONNEL, ON BOARD, INVOLVED IN THE CARGO HANDLING OR DEBALLASTING OPERATIONS AT THE TERMINAL.

18.1.1 EMERGENCY SIGNALS

(a) FIRE IN THE TERMINAL

Emergency Alarm: Interrupted signal producing distinctive wailing sound for 2 minutes as follows:

30 seconds – siren

15 seconds – silence

30 seconds – siren

15 seconds – silence

30 seconds – siren

IMPORTANT: Terminal Emergency Alarm is tested at 1000 hours every Saturday

Test Alarm (ALL CLEAR only): Straight run Siren for two minutes

(b) MAJOR EMERGENCY REQUIRING EVACUATION OF TERMINAL

Same type of siren as in case of Fire in the terminal but the same will be sounded for three times at the interval of two minutes.

ACTION: On hearing either of these signals all operations will cease, arms/hoses to be disconnected and preparations to be made for immediate evacuation of the berth.

(c) FIRE ON BOARD

Alarm: Seven short blasts followed by one long blast on the ship's whistle.

Advise Main Control Room (MCR) / Jetty Control Room (JCR) by Ship-Shore Phone / Hotline / VHF radio.

ACTION: Cease all operations, arms/hoses to be disconnected and preparations to be made for immediate evacuation of the berth. The ship's crew to fight fire and take such action as required preventing fire from spreading.

(d) MEDICAL EMERGENCY ONBOARD

Advise JCR Radio Officer immediately by VHF radio. The Terminal will advise the OHC (Occupational Health Centre) for immediate assistance.

(e) EMERGENCY ESCAPE ROUTE (Refer Appendix 18)

The primary escape route is by terminal gangway to Jetty. Although these generally direct personnel towards the shore end of the trestle there may be occasions when this is

not possible and evacuation takes place from the Port Craft Jetty at North jetty and from emergency ladder at MD1 & MD8 of South jetty.

A Secondary means of escape must be provided on vessel's offshore side. This may be either:

1. Ship's accommodation ladder rigged and ready for lowering.
2. Ship's lifeboat lowered to embarkation deck.

(f) LIGHTENING

All cargo operations shall cease when lightening is in the vicinity.

(g) SAFETY CLOTHING

All ship's personnel working on deck must wear the appropriate Personal Protective Equipment: Safety Shoes, Helmets, Safety Goggles, Protective anti-static clothing. etc.

(h) FIRE PROTECTION FACILITIES AT JETTY HEAD:

S.NO.	PROTECTION FACILITY	NORTH JETTY	SOUTH JETTY
1	Tower Monitor	Yes (2 nos.)	Yes (2 nos.)
2	Jumbo Water Curtail	Yes (1 no.)	Yes (1 no.)
3	Water Spray System	Yes (1 no.)	Yes (1 no.)
6	Portable Extinguisher (DCP/CO_2)	Yes (10 nos.)	Yes (13 nos.)
7	Mobile Extinguisher (DCP/CO_2/Foam)	Yes (6 nos.)	Yes (4 nos.)
8	Double Hydrant	Yes (5 nos.)	Yes (5 nos.)
9	BA Set	Yes (2 nos.)	Yes (2 nos.)
10	Foam Trolley (200 Litres)	Yes (1 no.)	Yes (1 no.)
11	Skid Mounted fixed DCP System	-	Yes (1 no.)
12	International Shore Connection	Yes (1 no.)	Yes (1 no.)

Additionally, Terminal has one DCP Tender and two Multipurpose Tenders (Water/Foam/DCP) and one Quick Response Fire Jeep (Equipped with Fire Rescue devices) for fighting Fire in Jetty area.

ALL ACTIONS SHOULD CONFIRM TO THE PROCEDURES STATED IN SECTION 18.2.

18.2 EMERGENCY PROCEDURES

Important: On arrival Master of the Ship shall provide a copy of Ship's **Emergency Response Plan** & **Fire Plan** for Terminal's reference in case of Emergency**.** Terminal will retain these plans till safe completion of the Ship/Shore operation.

18.2.1 EMERGENCY (REMOTE) MOORING HOOKS RELEASE

Port Operator is responsible for the operation of the mooring hooks.

Under normal circumstances, only manual (local) activation *of* the hook releases is permitted and this operation is to be conducted by the mooring crew of Port Operator.
In emergency situations, the mooring hooks may be remotely released only by the Terminal. For emergency releases, the following procedure must be complied with:

CAUTION: THE RELEASE OF ALL THE MOORING HOOKS AT THE SAME TIME IS NOT PERMITTED.

The Master, when requesting emergency release, shall convey the following instructions to the Terminal using VHF Ch. [to be decided in Ship/Shore pre-discharge meeting]:

- This is the Master of LNG Tanker xx-zzzzz
- Activate the Remote Release of the Mooring Hooks
- I repeat, Activate the Remote Release of the Mooring Hooks
- This is the Master of LNG Tanker xx-zzzzz

The Terminal, after receiving clear instructions from the Master (through VHF Ch.) shall immediately request verbal confirmation for the emergency release from the duty 'Pilot or Jetty Control Room (JCR).

The duty Pilot or JCR shall confirm emergency release using the following statement:

• This is the duty Pilot, [name] or JCR
• PLL Terminal, you are authorized for emergency release.
• I repeat, PLL Terminal, you are authorized for emergency release.
• This is the duty Pilot, [name] or JCR

The sequence of hook release indicated by the Ship's Master/Pilot must be strictly adhered to.

18.2.2 EMERGENCY CONTACT NUMBERS (From Ship to Shore)

1. Hot line between Ship and shore
2. Main Control Room : 101/102
3. Jetty Control Room : 325 (North Jetty) / 330 (South Jetty)
4. Fire Station : 444 /445
5. Occupational Health Centre (OHC) : 455/456
6. Security (Main Gate) : 164

18.2.3 EMERGENCY SCENARIO

Case I

"STOP DISCHARGING OPERATION"					
Item	**Ship side**	**Communication**		**Shore side**	**Remarks**
		Ship	**Shore**		
Stoppage of discharging caused by terminal				Notice of emergency and request for stop unloading	
	Stop cargo pumps				
	Close liquid unloading valves			Stop shore BOG compressor	
				Notice of stoppage of shore BOG compressor	
				Determine if necessary to disconnect unloading arms	
Stoppage of unloading caused by ship	Notice of emergency and request stoppage of discharging				
	Stop cargo pumps			Stop shore BOG compressor	
				Notice of stoppage of shore BOG compressor	
	Close liquid unloading valves			Determine if necessary to disconnect loading arm	

Case II

ELECTRICAL POWER FAILURE ON SHORE SIDE					
Item	**Ship side**	**Communication**		**Shore side**	**Remarks**
		Ship	**Shore**		
Electrical power failure				Notice of electrical power Failure and request stop discharging	
	"Stop discharging"			"stop discharging"	
Resumption of power				Notice of resumption of power. Trip reset. Request opening of liquid valves	
	Notice of liquid valve opened				
	Resume discharging using standard procedure			Resume discharging using standard procedure	

Case III

ARM OVER MOVEMENT					
Item	**Ship side**	**Communication**		**Shore side**	**Remarks**
		Ship	**Shore**		
Actuation of trip system (ESD)				Notice of ESD by arm over movement	
	Confirmation of closing of all liquid and vapor manifold ESD valve			Confirmation of closing of double ball valves (DBV)	
	Checking of mooring lines & ship's position			Confirm isolation of utilities connected to ship	
	Meeting for discussion of resumption of discharging			Checking of arms condition	Clarification of causes
Resumption of discharging				Cause of the trip detected and problem resolved	
				Reset trip.	
				Notice of trip reset	
				Notice of resumption of discharging	
	Resume discharging using standard procedure			Resume discharging using standard procedure	

ARM OVER MOVEMENT					
Item	**Ship side**	**Communication**		**Shore side**	**Remarks**
		Ship	**Shore**		
Resumption of discharging not possible				Notice of purging & disconnection of all arms. Setting back of all arms.	
			←	Notice of completion of setting back of all arms.	
			←	Notice of removal of gangway. Removal of gangway	
	Assist as required				
			←	Notice of completion of removal of Gangway	
			←	Request for removal of electric cable,Optic cable & pneumatic ESD line.	
	Disconnect electric cable & pneumatic ESD line		←	Removal of electric cable,Optic cable & pneumatic ESD line.	
	Reposition ship				
	Notice of completion of ship's repositioning			Request for ship's repositioning. Assist as required.	
	Resumption of discharging in accordance with normal procedure		↔	Resumption of discharging in accordance with normal procedure.	

Case IV

LNG LEAKAGE					
Item	**Ship side**	**Communication**		**Shore side**	**Remarks**
		Ship	**Shore**		
	Confirm all doors, hatches, etc. Leading to the upper deck from the accommodation area, engine room, etc. are shut. If necessary by location of leak and its scale, stop ventilation fans. If beneficial to enhance evaporation, fire hoses should be used to spray the area. If appropriate, stop discharging or activate ESD If appropriate, activate water spray system	←	→	If appropriate, stop discharging or activate ESD If appropriate, activate water spray system on berth	

Case V

FIRE					
Item	**Ship side**	**Communication**		**Shore side**	**Remarks**
		Ship	**Shore**		
Fire on the ship	Stop discharging Activate water spray system Ship's crew will fight the fire Request tugboats to assist in firefighting if appropriate Preparations for un-berthing (tugboats, etc.) Shall be made. If necessary, vessel will vacate the berth		⟷	Stop discharging If appropriate, activate berth water spray system. Preparations to disconnect unloading arms should be made	
Fire on the shore	Stop discharging If appropriate, activate water spray system Preparations for un-berthing (tugboats, etc) shall be made. If necessary, vessel will vacate the berth		⟷	Stop discharging If appropriate, activate berth water spray system Shore side personnel will fight the fire Preparations to disconnect unloading arms should be made	

18.3 EMERGENCY SHUT DOWN (ESD)

The ESD system at Dahej LNG Terminal includes three main functions:

ESD 1 : related to the ship unloading operation
ESD 2 : related to the gas send out operation
ESD 3 : related to the complete LNG terminal

The splitting in relation to the 2 main process operations are available by consideration of the segregation of these two process operations allowing the stopping for emergency purpose of one process operation with the proceeding of the other process operation.

ESD FUNCTION – SHIP UNLOADING OPERATION

Three main assemblies are involved in this ESD 1 operation:

- The LNG Tanker
- The Ship unloading arm station
- The shore process installation including the LNG line up to the LNG tanks.

LNG TANKER EMERGENCY SHUTDOWN SYSTEM

LNG Tanker is equipped with its own emergency shutdown system (Ship ESD).

LNG Tanker ESD is to be interlocked with the shore ESD 1 system to perform the two main actions:

(i) To activate the ship ESD when the shore ESD 1 is activated.
(ii) To activate the shore ESD 1 when the ship ESD is activated.

SHIP UNLOADING ARM STATION

The emergency shutdown logic of this station is designed to perform two main step actions:

(i) Step action – closing of the LNG / NG valves.
(ii) Step action – the disconnection of the arms LNG / NG from the ship

1st Step - Closing of the LNG / NG valves

The arm ESD sends one ESD signal to the shore ESD 1 system to perform:

- The closing of the LNG / NG valves on the shore installation.
- The closing of the LNG / NG valves on board of LNG carrier (by shore ESD 1 to ship ESD).

These actions can be performed by two modes:

(i) Manually by operator

a) By the emergency shutdown push button on the ship arm board located on the jetty platform.

b) By the shore ESD 1 signal received by ship arm board.

(ii) Automatically when one of the ship unloading arms reaches the first limit of its operating area.

For that purpose, several position detectors are installed on each ship arm.

2nd Step - Disconnection of arms from LNG carrier (PERC)

The arm ESD is designed to proceed to the disconnection of the arms from the LNG Tanker automatically or manually.

a) Automatically
The emergency disconnection system (called also emergency release system (ERS)) is activated automatically when one of the ship arms reaches the second limit of its operating area.

b) Manually
The emergency disconnection is performed also by the action of the jetty Chief Operator on the dedicated push button installed in a protective cap on the ship arm board.

c) Remark: the activation of this emergency disconnection manually or automatically, initiates immediately an ESD 1 procedure to perform the closing operation of the LNG / NG valves as described previously. A second time lag is considered for that operation before the disconnection.

d) Note: As this emergency disconnection is a critical operation, it is generally recommended to activate such procedure manually from only one location i.e. the ship arm board. The safety logic of this disconnection procedure is then performed only internally to the ship arm board.

The ship arm board is equipped with alarm related to ESD and ERS. Horn is also activated.

SHORE PROCESS INSTALLATION ASSOCIATED TO THE SHIP UNLOADING

This shore process installation is equipped of an emergency shutdown system (ESD 1 or shore ESD 1) to set this installation in safety condition in all circumstances with or without ship at the jetty to allow the partition of the LNG / NG lines when any trouble appears on these lines or in their vicinity.

This ESD 1 system will be activated by:

- The ship ESD (as described here above).
- The ship arm ESD (as described here above).
- The field located ESD 1 push button.
- The ESD 1 push button in the control room of the LNG plant.
- The fire, gas and spill detections at the jetty head signal coming from the Fire Board.
- The general emergency shutdown ESD 3 procedure.

This activation will induce the following actions:

1. Closing of the LNG valves installed in the LNG unloading lines.
2. Closing of the NG valves installed in the NG return line.

APPENDIX 1

Masters are requested to sign the 'Conditions of Use' as a prerequisite of entering the PLL Port

CONDITIONS OF USE

For the PLL at Dahej, Gujarat
[Applicable to LNG tankers only]

I, _____ the Master ("Master") of the ship

_____ ("Ship") owned by

_____ ("Owner") whose address is at

_____

hereby acknowledge receipt of these conditions of use ("Conditions of Use") of the Port of Dahej, Gujarat Port ("Port") and a copy of the Dahej LNG Port Regulations ("Port Regulations") and in consideration for permission to use the Port, hereby agree to be bound by the terms and conditions of these Conditions of Use the Port Regulations and such other law, rules and regulations applicable in the Port as may be issued by the Port Management or agency of the Government of the State of Gujarat, India.

1. The definitions appearing in the Port Regulations are incorporated herein by reference and the following definitions are applicable:

   "**Company**" means Petronet LNG Limited ("PLL") and its affiliated companies operating at the Port, including their respective directors, officers, agents, employees and servants:

   "**Port Facilities**" mean all infrastructure, equipment and installations at the Port, whether fixed or movable, including the channel, channel markings, buoys, jetties, berths, lines, gangways, water craft, bunkering and loading facilities;

   "**Port Management**" means PLL and its affiliated companies,

   "GMB" means the Gujarat Maritime Board, a body constituted under the Gujarat Maritime Board Act 1981.

   "**Port Services**" means any service tendered or provided by the Port Management to the Ship, including pilotage, towage, tug assistance, mooring or other navigational services, whether for consideration or free of charge.

2. The Master shall be responsible, at all times and under all circumstances, for the safe and proper operation and navigation of the Ship. Whilst the GMB / Company shall exercise reasonable care, skill and diligence to ensure the proper rendering of Port Services, the GMB / Company makes no warranty with respect thereto and any use thereof shall be at the sole risk of the Master and the Owner. The GMB / Company shall not be responsible for any loss or damage to the Ship, actual or consequential, which is related to Port Services provided to the Ship regardless of any act, omission, fault or neglect of the GMB / Company, including pilot's neglect, error or mistake.

3. Whilst the GMB / Company has taken reasonable care to ensure that the Port Facilities are safe and suitable, the GMB / Company makes no warranty with respect thereto and any use thereof shall be at the sole risk of the Master and the Owner. The GMB / Company shall not be responsible for any loss or damage to the Ship, actual or consequential, which is related to the use of the Port Facilities by the Ship regardless of any act, omission, fault or neglect on the part of the GMB / Company.

4. The GMB / Company shall not be responsible for the acts or omissions of its servants or agents relating to any loss or damage to the Ship, or any loss or injury suffered by the Master, officers or crew.

5. The GMB / Company shall not be responsible to the Ship for any loss related to strikes or other labour disturbances whether the GMB / Company or its servants or agents are parties thereto or not.

6. The Master and the Owner shall, in all circumstances, hold harmless and indemnify the GMB / Company against any claim, cost or expense arising from:

   (i) any loss suffered by the GMB / Company with respect to damage to the Port Facilities or injury to its personnel which is related to the use of the Port by the Ship and which involves the fault, wholly or partially, of the Master, officers or crew, including negligent navigation;

   (ii) any loss suffered by third parties with respect to damage to their property or injury to their personnel which is related to the use of the Port by the Ship and which involves the fault, wholly or partially, of the Master, officers or crew, including negligent navigation;

   (iii) any loss suffered by the GMB / Company with respect to a hazard under paragraph 7 hereof;

   (iv) any loss or damage to the Ship while in Port, including consequential losses and all claims, damages and costs arising therefrom, regardless of any act, omission, fault or neglect on the part of the GMB / Company; and

   (v) any personnel injury or property loss suffered by the Master, officers or crew, of the Ship while in Port, including consequential losses and all claims, damages and costs arising therefrom, regardless of any act, omission, fault or neglect on the part of the GMB / Company.

7. If the Ship or any object on board becomes, or is likely to become, an obstruction threat, or danger to navigation, operations, safety, health, environment or security of the Port (a "hazard"), the Master and the Owner shall, at the option of the Port Management, take immediate action to clear, remove or rectify the hazard as the Port Management may direct, or the Port Management shall be entitled to take such measures as it may deem appropriate to clear, remove or rectify the hazard and the Master and Owner shall be responsible for all costs and expenses associated therewith.

8. Any liability incurred by the Master and/or Owner by operation of these Conditions of Use shall be joint and several.

9. Without limitation to the liability of the Master and the Owner, the Master shall immediately report to the Port Management any accident, incident, claim, damage, loss or unsafe condition or circumstance. Any such report shall be made in writing and signed by the Master. The Port Management shall be entitled to inspect and investigate any such report but without prejudice to the foregoing.

10. These Conditions of Use shall be construed, interpreted and applied in accordance with the laws of the State of Gujarat, India and, with respect thereto, the parties named herein submit exclusively to the jurisdiction of the courts of the State of Gujarat, India.

11. Subject to condition 12, any liability of the Master and Owner to the Company by virtue of the operation of these Conditions of Use shall be limited to US $150,000,000 for any one accident or occurrence.

12. The limit of liability set out in condition 11 shall not limit, restrict or prejudice any claim or right that the GMB / Company has or may have against the Master and/or Owner under general principles of law or equity. For the avoidance of doubt, said limit or liability shall only apply with respect to, and to the extent of, a claim by the GMB / Company against the Master and/or Owner under these Conditions of Use.

Signed and acknowledge:

By : _____

Date : _____

Time : _____IST

APPENDIX 2

PRE-ARRIVAL NOTIFICATION OF SECURITY (PANS) for:

a) Passenger ships including high speed passenger craft,

b) Cargo ships, including high-speed craft, of 500 GRT & upwards, and

c) Mobile offshore drilling units.

This form is to be submitted to the authorities **at least 96 hours prior** to the arrival of the vessel. If the voyage is shorter than 96 hours, PANS shall be submitted within 2 hours of departure from the load port. The email addresses are:
indsar@vsnl.net, **wncmocmb-navy@nic.in** and **amitashat@petronetlng.in**

***1.* Particulars of the ship and contact details**		
1.1 IMO Number:	*1.2* Name of the ship:	
1.3 Port of registry:	*1.4* Flag State:	*1.5* Type of ship:
1.6 Call sign:	*1.7* Inmarsat call Numbers:	*1.8* Gross Tonnage:
1.9 Name of Company:		
1.10 Name and 24 hour contact details of Company Security Officer: Name: ..... Tel no.:		
2. Port and port facility information		
2.1 Port of arrival and port facility where the ship is to berth, if known		
2.2 Expected date and time of arrival of the ship in port (paragraph B/4.39.3 of the ISPS Code):		

2.3 Primary purpose of call: Cargo operation/ Taking Bunkers/ taking Supplies/ repair/ Changing Crew/ Passengers (Embarking/ Disembarking)/ Others **(Delete as appropriate)** If others, pleases specify purpose: ……

3. Information required by SOLAS regulation XI-2/9.2.1
3.1 The ship is provided (SOLAS REGULATION 9.2.1.1) with a valid: International Ship Security Certificate ☐ YES ☐ NO Interim International Ship Security Certificate ☐ YES ☐ NO
3.1.1 Certificate indicated in 3.1 has been issued by: Name of issuing authority: …… Date of expiry: ……..
3.1.2 If the ship is not provided with a valid International Ship Security Certificate or a valid Interim International Ship Security Certificate, explain why?
3.1.2.1 Does the ship have an approved ship security plan on board? ☐ YES ☐ NO
3.2 Current security level (SOLAS regulation XI-2/9.2.1.2):
3.2.1 Location of ship <u>at the time the report is made</u> (paragraph B/4.39.2 of the ISPS Code): Latitude: …… Longitude: …… or Port: ……

3.3 List the last 10 calls in chronological order with the most recent call first, at port facilities at which the ship conducted ship/ port interface together with the security level at which the ship operated (SOLAS regulation XI-2/9.2.1.3):

No	Date		Port, Country, Port Facility and UNLOCODE	Security level
	From	To		
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				

3.3.1 Did the ship, during the period specified in *3.3,* take any special or additional security measures, beyond those specified in the approved ship security plan?

☐ YES ☐ NO

3.3.2 If your answer to *3.3.1.* is YES, for each of such occasions please indicate the special or additional security measures which were taken by the ship (SOLAS regulation XI-2/9.2.1.4):

No	Date		Port, Country, Port Facility and UNLOCODE	Special or additional measures
	From	To		
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				

3.4 List the ship to ship activities in chronological order with the most recent ship- to-ship activity first, which have been carried out during the period specified in *3.3*:

☐ NOT APPLICABLE

No	Date		Port, Country, Port Facility and UNLOCODE	Ship-to-ship Activity
	From	To		
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				

3.4.1 Have the ship security procedures, specified in the approved ship security plan, been maintained during each of the ship-to-ship activities specified in 3.4 (SOLAS regulation XI-2/9.2.1.5)?

☐ YES ☐ NO

3.4.2 If the answer to *3.4.1.* is NO, identify the ship to ship activities for which the ship security procedures were not maintained and indicate, for each, the security measures which were applied in lieu:

No	Date		Security measures applied	Ship-to-ship activity
	From	To		
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				

3.5 Provide a general description of cargo aboard the ship (SOLAS regulation XI-2/9.2.1.6 and paragraph B/4.39.5 of the ISPS Code):
3.5.1 Is the ship carrying any dangerous substances as cargo? ☐YES ☐ NO
3.5.2 If the answer to 3.5.1. is YES, provide details or attach a copy of the Dangerous Goods Manifest (IMO FAL FORM 7)

3.6 A copy of the ship's Crew List (IMO FAL Form 5 is attached) (SOLAS regulation XI-2/9.2.1.6 and paragraph B/4.39.4 of the ISPS Code)
3.7 A copy of the ship's Passenger List (IMO FAL Form 6 is attached) (SOLAS regulation XI-2/9.2.1.6 and paragraph B/4.39.6 of the ISPS Code)
***4.* Other security related information**
4.1 Is there any security related matter you wish to report? ☐ YES ☐ NO
4.1.1 If the answer to 4.1 is YES, provide details:
***5.* Agent of the ship at the intended port of arrival**
5.1 Name and 24-hour contact details of Agent in intended port of call: …….. Tel no: …… Fax No: ……
6. Identification of the person providing the information
6.1 Name: …….. 6.2 Title or position: …….. 6.3 Signature: …… This report is dated at (Place) …… On (Date and time) ……

APPENDIX 3

STANDARD PRE-ARRIVAL MESSAGE

1. Ship's Name	Call Sign
2. IMO No	MMSI No
3. Nationality	Port Of Registry
4. Name Of Master	
5. Total Crew onboard including Master	
6. GRT	NRT
7. Summer Deadweight (T)	Present Displacement
8. Length Over All (M) Length of bulbous bow (M)	Beam
9. Draft F/A (M) Arrival	Departure
10. Voyage No	
11. Distance & location(Fwd or Aft) of Vapour Manifold from the Midships:	
12. Are Navigation, Manoeuvring (Steering gear), Mooring and Cargo Equipments in good order? State if any defects or deficiency.	
13. Type of Mooring Lines on board	
14. P&I Club Name And Validity	
15. Last Port Of Call	
16. Last Indian Port of Call	Date
17. Security Level	
18. Does vessel has fully operational approach Doppler log?	
19. Does vessel has operational Bow/Stern thrusters?	
20. Is Gas Detection system fully operational?	
21. Confirm Ship's lines will be cooled down prior arrival at Pilot Station?	
22. Are Smoke/Fire Detection and Fixed Fire Extinguishing Systems fully operational?	
23. Cargo Quantity onboard, Quantity to be unloaded, Heel quantity and Cargo Density?	
24. Ballast on board	
25. Maximum unloading rate & anticipated Discharging time	
26. Confirm Cargo Transfer Emergency Stops tested from all locations	
27. Confirm tank high level and pressure alarms operational	
28. Confirm that remotely operated manifold valves have been operated through a complete open/closed cycle, ensure correct functioning and advise valve type and actual closing time	
29. Confirm both Anchors will be cleared away and Main Engine tested Astern before Pilot boards	
30. Confirm all Statutory Certificates are valid (Refer section 3.4 item 4)	
31. Any change in vessel's equipment since her last visit to Dahej LNG Terminal	
32. Inmarsat No. Telex No. Telefax No.	
33. Is it vessel's first unloading after delivery or after Dry docking?	

APPENDIX 4

DAHEJ LNG TERMINAL

VESSEL DEFICIENCY NOTICE

The Master SS/MV: _____

Date: _____

The following deficiencies, which are deemed to affect the safe and efficient operation of your vessel at Dahej LNG Terminal, are hereby brought to your attention.

- ☐ Pilot boarding arrangements
- ☐ Navigation equipment (specify):
- ☐ Radars; ARPA
- ☐ Speed log; Doppler
- ☐ Gyro compass; Magnetic compass
- ☐ GPS / Satnav system
- ☐ Cargo hose crane / derrick / winch
- ☐ Pollution control equipment
- ☐ Safety & Fire Fighting equipment
- ☐ Wires and ropes
- ☐ Windlass and anchors
- ☐ Miscellaneous
- ☐ Cargo handling equipment (Specify):
- ☐ Cargo monitoring equipment
- ☐ Pumping capacity
- ☐ Ballast operations
- ☐ Manifolds
- ☐ Communications systems
- ☐ Mooring equipment
- ☐ Mooring winches
- ☐ Engines & Auxiliary equipment
- ☐ Steering gear

Comments:

_____

_____

Please acknowledge receipt by signing and returning the copy.

Master : _____

For Terminal : _____

APPENDIX 5

DAHEJ LNG TERMINAL

PILOT PASSAGE PLAN – INBOUND

SHIPS NAME: ……			**DATE**……. **TIME** …….
L.O.A.:……..….**m**			**DISPL:**……..…..**mt**
DRAFT:	**F** ……...**m**		**A** …….**m**
PASSAGE:	**FROM**…… **TO**……..		
TIDE:	**HW**	**TIME**……**hrs**	**HEIGHT**……..**m**
	LW	**TIME**……**hrs**	**HEIGHT**……..**m**
LEAST DEPTHS:	**CHANNEL**……..**m** **UKC**……**m**		**BERTH**…..……**m**

The Pilot and Master have both discussed together and satisfied themselves as to all aspects of the navigation and berthing plans for the vessel.

1. MASTER

The Master has informed the Pilot of the characteristics of his vessel and of any defects with regard to navigational equipment, engines or any other equipment that may affect the safe navigation of the vessel.

2. PILOT

The Pilot has discussed with the Master the intended route of the vessel, the depth of water available and any defect to navigation aids that may affect the safe navigation of the vessel. In addition in conjunction with the Officers all aspects of the berthing plan have been advised to the Master to include equipment required from the ship.

Both parties are satisfied that the above requirements have been met and acknowledged by their signatures below.

Signed

Master : _____

Pilot : _____

Date : _____ Time : _____

APPENDIX 6

DAHEJ LNG TERMINAL

PILOT PASSAGE PLAN – OUTBOUND

SHIPS NAME: ……			**DATE**……. **TIME** …….
L.O.A.:……..….**m**			**DISPL:**……..…..**mt**
DRAFT:	**F** ……...**m**		**A** ……. **m**
PASSAGE:	**FROM**…… **TO**……..		
TIDE:	**HW**	**TIME**……**hrs**	**HEIGHT**……..**m**
	LW	**TIME**……**hrs**	**HEIGHT**……..**m**
LEAST DEPTHS:	**CHANNEL**……..**m** **UKC**……**m**		**BERTH**…..……**m**

The Pilot and Master have both discussed together and satisfied themselves as to all aspects of the navigation and un-berthing of the vessel.

1. MASTER

The Master has informed the Pilot of the characteristics of his vessel and of any defects with regard to navigational equipment, engines or any other equipment that may affect the safe navigation of the vessel.

2. PILOT

The Pilot has discussed with the Master the intended route of the vessel, the depth of water available and any defect to navigation aids that may affect the safe navigation of the vessel. In addition in conjunction with the
Officers all aspects of the berthing plan have been advised to the Master to include equipment required from the ship.

Both parties are satisfied that the above requirements have been met and acknowledged by their signatures below.

Signed

Master : _____

Pilot : _____

Date : _____ Time : _____

APPENDIX 7

SAFETY LETTER

Company……
Terminal……..
Date……
The Master SS/MV……
Port……..

Dear Captain,

Accountability for the safe conduct of operations while your ship is at this Terminal rests jointly with you, as Master of the ship, and with the Terminal Representative. Before operations start, your full co-operation and understanding is required to ensure the safety requirements set out in the ship/shore safety checklist are followed. These requirements are based on safe practices that are widely accepted by the Society of International Gas Terminal and Tanker Operators.

We expect you, and all under your command, to adhere strictly to these requirements throughout your ship's stay alongside this Terminal. We will ensure that our personnel do likewise and will co-operate fully with you in the mutual interest of safe operations.

Before the start of operations, and then from time to time, for our mutual safety, a member of the Terminal staff, together with a Responsible officer where appropriate, will make a routine inspection of your ship.

Where corrective action is needed, we will not agree to operations starting. If they have started, we may require them to be stopped immediately. Similarly, if you consider that safety is being endangered by any action on the part of our terminal staff or by any equipment under our control, you should request operations to be stopped immediately.

THERE CAN BE NO COMPROMISE WITH SAFETY.

Please acknowledge receipt of this letter by countersigning and returning the attached copy.

Signed: _____
(Terminal Representative)

Terminal Representative on Duty: _____

Position or Title: _____

Contact Details: _____

Signed: _____
(Master)

SS/MV: _____

Date:_____ Time:_____

APPENDIX 8

THE SHIP / SHORE SAFETY CHECK-LIST

Checks pre-arrival

Date and time:

Port and berth:

Tanker:

Terminal:

Product to be transferred:

Part 1A. Tanker: checks pre-arrival			
Item	**Check**	**Status**	**Remarks**
1.	Pre-arrival information exchanged	☐ Yes	
2.	International shore fire connection is available	☐ Yes	
3.	Transfer hoses are of suitable construction	☐ Yes	
4.	Terminal information booklet reviewed	☐ Yes	
5.	Pre-berthing information is exchanged	☐ Yes	
6.	Pressure/vacuum valves and/or high velocity vents are operational	☐ Yes	
7.	Fixed and portable oxygen analysers are operational	☐ Yes	

Part 1B. Tanker: checks pre-arrival if using an inert gas system			
Item	**Check**	**Status**	**Remarks**
8.	Inert gas system pressure & oxygen recorders are operational	☐ Yes	
9.	Inert gas system and associated equipment are operational	☐ Yes	
10.	Cargo tank atmospheres' oxygen content is less than 8%	☐ Yes	
11.	Cargo tank atmospheres are at positive pressure	☐ Yes	

Part 2. Terminal: checks pre-arrival			
Item	**Check**	**Status**	**Remarks**
12.	Pre-arrival information is exchanged	☐ Yes	
13.	International shore fire connection is available	☐ Yes	
14.	Transfer equipment is of suitable construction	☐ Yes	
15.	Terminal information booklet transmitted to tanker	☐ Yes	
16.	Pre-berthing information is exchanged	☐ Yes	

Part 3. Tanker: checks after mooring			
Item	**Check**	**Status**	**Remarks**
17.	Fendering is effective	☐ Yes	
18.	Mooring arrangement is effective	☐ Yes	
19.	Access to and from the tanker is safe	☐ Yes	
20.	Scuppers and savealls are plugged	☐ Yes	
21.	Cargo system sea connections & overboard discharges are secured	☐ Yes	
22.	Very high frequency and ultra-high frequency transceivers are set to low power mode	☐ Yes	
23.	External openings in superstructures are controlled	☐ Yes	
24.	Pumproom ventilation is effective	☐ Yes	
25.	Medium frequency/high frequency radio antennae are isolated	☐ Yes	
26.	Accommodation spaces are at positive pressure	☐ Yes	
27.	Fire control plans are readily available	☐ Yes	

Part 4. Terminal: checks after mooring			
Item	**Check**	**Status**	**Remarks**
28.	Fendering is effective	☐ Yes	
29.	Tanker is moored according to the terminal mooring plan	☐ Yes	
30.	Access to and from the terminal is safe	☐ Yes	
31.	Spill containment and sumps are secure	☐ Yes	

Checks pre-transfer

Date and time:

Port and berth:

Tanker:

Terminal:

Product to be transferred:

Part 5A. Tanker and terminal: pre-transfer conference				
Item	**Check**	**Tanker status**	**Terminal status**	**Remarks**
32.	Tanker is ready to move at agreed notice period	□ Yes	□ Yes	
33.	Effective tanker and terminal communications are established	□ Yes	□ Yes	
34.	Transfer equipment is in safe condition (isolated, drained and de-pressurised)	□ Yes	□ Yes	
35.	Operation supervision and watchkeeping is adequate	□ Yes	□ Yes	
36.	There are sufficient personnel to deal with an emergency	□ Yes	□ Yes	
37.	Smoking restrictions and designated smoking areas are established	□ Yes	□ Yes	
38.	Naked light restrictions are established	□ Yes	□ Yes	
39.	Control of electrical and electronic devices is agreed	□ Yes	□ Yes	
40.	Means of emergency escape from both tanker and terminal are established	□ Yes	□ Yes	
41.	Firefighting equipment is ready for use	□ Yes	□ Yes	
42.	Oil spill clean-up material is available	□ Yes	□ Yes	
43.	Manifolds are properly connected	□ Yes	□ Yes	
44.	Sampling and gauging protocols are agreed	□ Yes	□ Yes	
45.	Procedures for cargo, bunkers and ballast handling operations are agreed	□ Yes	□ Yes	
46.	Cargo transfer management controls are agreed	□ Yes	□ Yes	
47.	Cargo tank cleaning requirements, including crude oil washing, are agreed	□ Yes	□ Yes	See also parts 7B/7C as applicable

Item	Check	Tanker status	Terminal status	Remarks
48.	Cargo tank gas freeing arrangements agreed	□ Yes	□ Yes	See also part 7C
49.	Cargo and bunker slop handling requirements agreed	□ Yes	□ Yes	See also part 7C
50.	Routine for regular checks on cargo transferred are agreed	□ Yes	□ Yes	
51.	Emergency signals & shutdown procedures are agreed	□ Yes	□ Yes	
52.	Safety data sheets are available	□ Yes	□ Yes	
53.	Hazardous properties of the products to be transferred are discussed	□ Yes	□ Yes	
54.	Electrical insulation of the tanker/terminal interface is effective	□ Yes	□ Yes	
55.	Tank venting system and closed operation procedures are agreed	□ Yes	□ Yes	
56.	Vapour return line operational parameters are agreed	□ Yes	□ Yes	
57.	Measures to avoid back-filling are agreed	□ Yes	□ Yes	
58.	Status of unused cargo and bunker connections is satisfactory	□ Yes	□ Yes	
59.	Portable very high frequency and ultra-high frequency radios are intrinsically safe	□ Yes	□ Yes	
60.	Procedures for receiving nitrogen from terminal to cargo tank are agreed	□ Yes	□ Yes	

Additional for chemical tankers Checks pre-transfer

Part 5B-N.A. (Point 61-70 only applicable to chemical tankers)
Additional for gas tankers Checks pre-transfer

Part 5C. Tanker and terminal: liquefied gas. Checks pre-transfer				
Item	**Check**	**Tanker status**	**Terminal status**	**Remarks**
71.	Inhibition certificate received (if required) from manufacturer	☐ Yes	☐ Yes	
72.	Water spray system is operational	☐ Yes	☐ Yes	
73.	Appropriate personal protective equipment is identified and available	☐ Yes	☐ Yes	
74.	Remote control valves are operational	☐ Yes	☐ Yes	
75.	Cargo pumps and compressors are operational	☐ Yes	☐ Yes	
76.	Maximum working pressures are agreed between tanker and terminal	☐ Yes	☐ Yes	
77.	Reliquefaction or boil-off control equipment is operational	☐ Yes	☐ Yes	
78.	Gas detection equipment is appropriately set for the cargo	☐ Yes	☐ Yes	
79.	Cargo system gauge operation and alarm set points are confirmed	☐ Yes	☐ Yes	
80.	Emergency shutdown systems are tested and operational	☐ Yes	☐ Yes	
81.	Cargo handling rate and relationship with valve closure times and automatic shutdown systems is agreed	☐ Yes	☐ Yes	
82.	Maximum/minimum temperatures/pressures of the cargo to be transferred are agreed	☐ Yes	☐ Yes	
83.	Cargo tank relief valve settings are confirmed	☐ Yes	☐ Yes	

Part 6. Tanker and terminals: agreements pre-transfer				
Part 5 item	**Agreement**	**Details**	**Tanker initials**	**Terminal initials**
32	Tanker manoeuvring readiness	Notice period (maximum) for full readiness to manoeuvre: Period of disablement (if permitted):		
33	Security Protocols	Security level: Local requirements:		

Part 5 item	Agreement	Details	Tanker initials	Terminal initials
33	Effective tanker/terminal communications	Primary system: Backup system:		
35	Operational supervision and watchkeeping	Tanker: Terminal:		
37 38	Dedicated smoking areas and naked lights restrictions	Tanker: Terminal:		
45	Maximum wind, current and sea/swell criteria or other environmental factors	Stop cargo transfer: Disconnect Unberth:		
45 46	Limits for cargo, bunkers and ballast handling	Maximum transfer rates: Topping-off rates: Maximum manifold pressure: Cargo temperature: Other limitations:		
45 46	Pressure surge control	Minimum number of cargo tanks open: Tank switching protocols: Minimum number of cargo tanks open: Tank switching protocols: Full load rate: Topping-off rate: Closing time of automatic valves:		
46	Cargo transfer management procedures	Action notice periods: Transfer stop protocols:		
50	Routine for regular checks on cargo transferred are agreed	Routine transferred quantity checks:		
51	Emergency signals	Tanker: Terminal:		

Part 5 item	Agreement	Details	Tanker initials	Terminal initials
55	Tank venting system	Procedure:		
55	Closed operations	Requirements:		
56	Vapour return line	Operational parameters: Maximum flow rate:		
60	Nitrogen supply from terminal	Procedures to receive: Maximum pressure: Flow rate:		
83	For gas tanker only: cargo tank relief valve settings	Tank 1: Tank 2: Tank 3: Tank 4: Tank 5: Tank 6: Tank 7: Tank 8: Tank 9: Tank 10:		
XX	Exceptions and additions	Special issues that both parties should be aware of:		

Part 7A. General tanker: checks pre-transfer			
Item	**Check**	**Status**	**Remarks**
84.	Portable drip trays are correctly positioned and empty	☐ Yes	
85.	Individual cargo tank inert gas supply valves are secured for cargo plan	☐ Yes	
86.	Inert gas system delivering inert gas with oxygen content not more than 5%	☐ Yes	
87.	Cargo tank high level alarms are operational	☐ Yes	
88.	All cargo, ballast and bunker tanks openings are secured	☐ Yes	

Part 7B-NA (Point 89-90 only applicable to crude oil washing ops)

After pre-transfer conference checks (Part 7C)
Part 7C-NA (Point 91-95 only applicable to tank cleaning and gas freeing alongside)

Declaration

We the undersigned have checked the items in the applicable parts 1 to 7 as marked and signed below:

	Tanker	Terminal
Part 1A. Tanker: checks pre-arrival	☐	☐
Part 1B. Tanker: checks pre-arrival if using an inert gas system	☐	☐
Part 2. Terminal: checks pre-arrival	☐	☐
Part 3. Tanker: checks after mooring	☐	☐
Part 4. Terminal: checks after mooring	☐	☐
Part 5A. Tanker and terminal: pre-transfer conference	☐	☐
Part 5B. Tanker and terminal: bulk liquid chemicals. Checks pre-transfer	☐	☐
Part 5C. Tanker and terminal: liquefied gas. Checks pre-transfer	☐	☐
Part 6. Tanker and terminal: agreements pre-transfer	☐	☐
Part 7A. General tanker: checks pre-transfer	☐	☐
Part 7B. Tanker: checks pre-transfer if crude oil washing is planned	☐	☐
Part 7C. Tanker: checks prior to tank cleaning and/or gas freeing	☐	☐

In accordance with the guidance in chapter 25 of *ISGOTT*, we have satisfied ourselves that the entries we have made are correct to the best of our knowledge and that the tanker and terminal are in agreement to undertake the transfer operation.

We have also agreed to carry out repetitive checks noted in parts 9 & 10 of the *ISGOTT* SSSCL, which should occur at intervals of not more than __hours for the tanker and not more than _____hours for the terminal.
If, to our knowledge, the status of any item changes, we will immediately inform the other party.

Tanker		Terminal	
Name	_____	**Name**	_____
Rank	_____	**Position**	_____
Signature	_____	**Signature**	_____
Date	_____	**Date**	_____
Time	_____	**Time**	_____

Checks during transfer Repetitive checks

Part 8. Tanker: repetitive checks during and after transfer								
Item ref	**Check**	**Time**	**Time**	**Time**	**Time**	**Time**	**Time**	**Remarks**
Interval time:_____hrs.								
8	Inert gas system pressure and oxygen recording operational	□ Yes	□ Yes	□ Yes	□ Yes	□ Yes	□ Yes	
9	Inert gas system and all associated equipment are operational	□ Yes	□ Yes	□ Yes	□ Yes	□ Yes	□ Yes	
11	Cargo tank atmospheres are at positive pressure	□ Yes	□ Yes	□ Yes	□ Yes	□ Yes	□ Yes	
18	Mooring arrangement is effective	□ Yes	□ Yes	□ Yes	□ Yes	□ Yes	□ Yes	
19	Access to and from the tanker is safe	□ Yes	□ Yes	□ Yes	□ Yes	□ Yes	□ Yes	
20	Scuppers and savealls are plugged	□ Yes	□ Yes	□ Yes	□ Yes	□ Yes	□ Yes	
23	External openings in superstructures are controlled	□ Yes	□ Yes	□ Yes	□ Yes	□ Yes	□ Yes	
24	Pumproom ventilation is effective	□ Yes	□ Yes	□ Yes	□ Yes	□ Yes	□ Yes	
28	Tanker is ready to move at agreed notice period	□ Yes	□ Yes	□ Yes	□ Yes	□ Yes	□ Yes	
29	Fendering is effective	□ Yes	□ Yes	□ Yes	□ Yes	□ Yes	□ Yes	
33	Communications are effective	□ Yes	□ Yes	□ Yes	□ Yes	□ Yes	□ Yes	
35	Supervision and watchkeeping is adequate	□ Yes	□ Yes	□ Yes	□ Yes	□ Yes	□ Yes	
36	Sufficient personnel are available to deal with an emergency	□ Yes	□ Yes	□ Yes	□ Yes	□ Yes	□ Yes	
37	Smoking restrictions and designated smoking areas are complied with	□ Yes	□ Yes	□ Yes	□ Yes	□ Yes	□ Yes	
38	Naked light restrictions are complied with	□ Yes	□ Yes	□ Yes	□ Yes	□ Yes	□ Yes	

Item ref	Check	Time	Time	Time	Time	Time	Time	Remarks
39	Control of electrical devices and equipment in hazardous zones is complied with	□ Yes	□ Yes	□ Yes	□ Yes	□ Yes	□ Yes	
40 41 42 51	Emergency response preparedness is satisfactory	□ Yes	□ Yes	□ Yes	□ Yes	□ Yes	□ Yes	
54	Electrical insulation of the tanker/terminal interface is effective	□ Yes	□ Yes	□ Yes	□ Yes	□ Yes	□ Yes	
55	Tank venting system and closed operation procedures are as agreed	□ Yes	□ Yes	□ Yes	□ Yes	□ Yes	□ Yes	
85	Individual cargo tank inert gas valves settings are as agreed	□ Yes	□ Yes	□ Yes	□ Yes	□ Yes	□ Yes	
86	Inert gas delivery maintained at not more than 5% oxygen	□ Yes	□ Yes	□ Yes	□ Yes	□ Yes	□ Yes	
87	Cargo tank high level alarms are operational	□ Yes	□ Yes	□ Yes	□ Yes	□ Yes	□ Yes	
Initials								

Part 8. Terminal: repetitive checks during and after transfer								
Item ref	**Check**	**Time**	**Time**	**Time**	**Time**	**Time**	**Time**	**Remarks**
Interval time:_____hrs.								
18	Mooring arrangement is effective	□ Yes	□ Yes	□ Yes	□ Yes	□ Yes	□ Yes	
19	Access to and from the tanker is safe	□ Yes	□ Yes	□ Yes	□ Yes	□ Yes	□ Yes	
29	Fendering is effective	□ Yes	□ Yes	□ Yes	□ Yes	□ Yes	□ Yes	
32	Spill containment and sumps are secure	□ Yes	□ Yes	□ Yes	□ Yes	□ Yes	□ Yes	
33	Communications are effective	□ Yes	□ Yes	□ Yes	□ Yes	□ Yes	□ Yes	
35	Supervision and watchkeeping is adequate	□ Yes	□ Yes	□ Yes	□ Yes	□ Yes	□ Yes	
36	Sufficient personnel are available to deal with an emergency	□ Yes	□ Yes	□ Yes	□ Yes	□ Yes	□ Yes	
37	Smoking restrictions and designated smoking areas are complied with	□ Yes	□ Yes	□ Yes	□ Yes	□ Yes	□ Yes	
38	Naked light restrictions are complied with	□ Yes	□ Yes	□ Yes	□ Yes	□ Yes	□ Yes	
39	Control of electrical devices and equipment in hazardous zones is complied with	□ Yes	□ Yes	□ Yes	□ Yes	□ Yes	□ Yes	
40 41 42 51	Emergency response preparedness is satisfactory	□ Yes	□ Yes	□ Yes	□ Yes	□ Yes	□ Yes	
54	Electrical insulation of the tanker/terminal interface is effective	□ Yes	□ Yes	□ Yes	□ Yes	□ Yes	□ Yes	
55	Tank venting system and closed operation procedures are as agreed	□ Yes	□ Yes	□ Yes	□ Yes	□ Yes	□ Yes	
Initials								

APPENDIX 9

COMMUNICATION AGREEMENT

An Electric/ Fiber-Optic cable connection will enable the following means of communication.

E.S.D FROM THE SHIP (Emergency Shut Down)	Uni-directional. Can be activated at any time from the ship in case of an emergency. Inform Terminal as far as possible before use.
E.S.D FROM THE TERMINAL (Emergency Shut Down)	Uni-directional. Can be activated at any time from the Terminal in case of an emergency. Inform Ship as far as possible before use.
HOTLINE	Bi-directional. To connect directly the Main Control Room in case of an Emergency.
TERMINAL INTERLINE	Bi-directional. To Exchange normal information between ship and Main Control Room during Cargo Handling Operation.
MOORING LINE TENSION DATA	Uni-directional. For the ship to receive information on the tension of each mooring line.

Communication Cable to be removed just prior to removal of Gangway.

A pneumatic cable connection will enable the following means of communication.

E.S.D FROM THE SHIP (Emergency Shut Down)	Uni-directional. Can be activated at any time from the ship in case of an emergency. Inform Terminal as far as possible before use.
E.S.D FROM THE TERMINAL (Emergency Shut Down)	Uni-directional. Can be activated at any time from the Terminal in case of an emergency. Inform Ship as far as possible before use.

EMERGENCY CONTACTS	
1)Control Room	102/104 /106,101(In case of emergency)
2)Shift In charge	103
3)Head (Port Operation)	322, Mob+919662526288
4)Jetty Control Room	325(North Jetty) / 330(South Jetty)
5)VHF	67/74

ROB to be achieved after unloading: m³

FOR SHIP (Person in charge)	**FOR TERMINAL (Person in charge)**
Name Position	Name Position
Signature	Signature
Date:	Time: hrs

Name Of PLL representative	**Contact No.**	**Shift**	**Shift Timings**
	9662526306(*6324) 9662526289(*6323)	M/E/N	

APPENDIX 10

TANKER TIME SHEET

Ship: _____ **Berth:** _____
Last Port: _____ **Next Port:** _____
Draft Arrival: _____ **Draft Departure:** _____

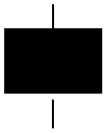
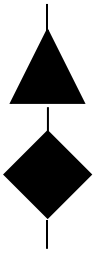
Item No.	Activity	Date/Time		Remarks
		Start	End	
1	End Of Passage			
2	NOR Tendered			
3	NOR Accepted			
4	Pilot on Board			
5	Tug Fast			
6	Mooring			First Line/ All Fast
7	Steam Off Engine			
8	Fitting Gangway			
9	Communication cable connected			
10	Connecting Pneumatic Line			
11	Communication test			
12	Oxygen Check			
13	Safety Inspection			
14	Inward Clearance			
15	Pre-Discharge Meeting			
16	Arms Connection			
17	Nitrogen Purge & Leak Test			
18	Initial Gauging (Opening CTM)			
19	ESD Test (When Warm)			
20	Cool Down			
21	Valve Operation Test			
22	Starting First Cargo Pump			
23	BOG Line Up to Ship			
24	Full Rate Discharge			
25	Stopping Return Gas			
26	Stopping all Cargo Pumps			
27	Stripping Pumps Operation			Total Cargo Time:
28	Closing Vapour ESD Valve			
29	Liquid / Vapour Line Purge			
30	Final Gauging (Closing CTM)			
31	Arms Disconnection			
32	Documentation			
33	Post Discharge Meeting			
34	Disconnecting Cables			
35	Removing Gangway			
36	Unmooring			
37	Pilot Disembark			

Delays (Total Time/Reason):
Cargo Qty: On Arrival: _____On Departure: _____Unloaded: _____
Signed for Vessel: _____ Signed for Terminal: _____
*(PORT LOG MAY ALSO BE USED IN PORT DURING THE PORT STAY / UNLOADING)

APPENDIX 11

STORM SIGNALS

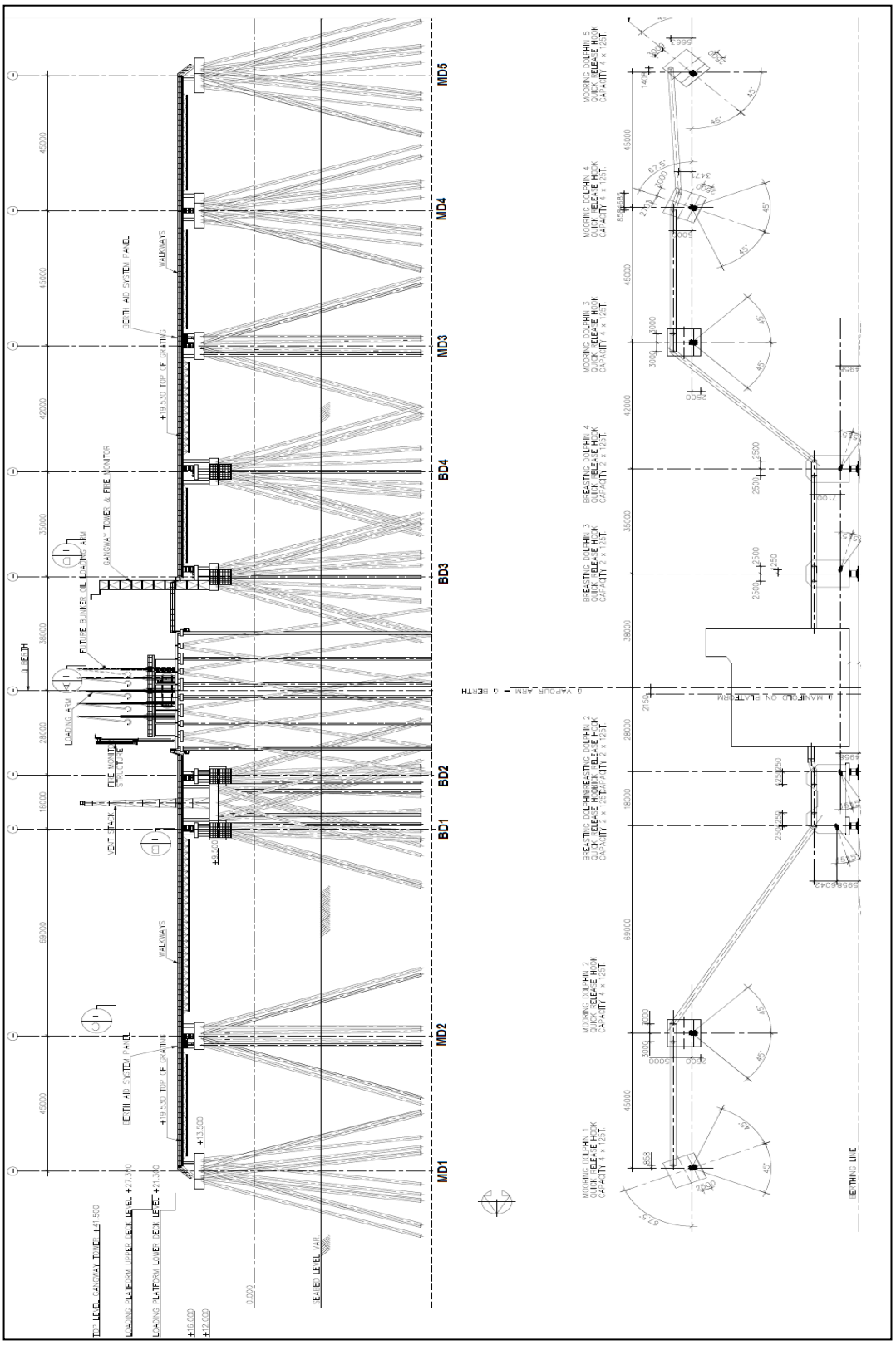
GUJARAT MARITIME BOARD

No	MEANING	DAY	NIGHT
1	**DISTANT CAUTIONARY** THERE IS A REGION OF SQUALLY WEATHER IN WHICH A STORM MAYBE FORMING		White ○ White ○
2	**DISTANT WARNING** A STORM HAS FORMED		Red ● Red ●
3	**LOCAL CAUTIONARY** THE PORT IS THREATENED BY SQUALLY WEATHER		White ○ Red ●
4	**LOCAL WARNING** THE PORT IS THREATENED BY A STORM BUT IT DOES NOT APPEAR THAT THE DANGER IS AS YET SUFFICENTLY GREAT TO JUSTIFY EXTREME MEASURES OF APPLICATION		Red ● White ○
5	**DANGER** THE PORT WILL EXPERIENCE SEVERE WEATHER FROM A CYCLONE EXPECTED TO MOVE KEEPING THE PORT TO THE LEFT OF ITS TRACK		White ○ White ○ Red ●
6	**DANGER** THE PORT WILL EXPERIENCE SEVERE WEATHER FROM A CYCLONE EXPECTED TO MOVE KEEPING THE PORT TO THE RIGHT OF ITS TRACK		Red ● White ○ White ○

No	MEANING	DAY	NIGHT
7	**DANGER** THE PORT WILL EXPERIENCE SEVERE WEATHER FROM A CYCLONE EXPECTED TO MOVE OR CLOSE TO THE PORT		White Red White
8	**GREAT DANGER** THE PORT WILL EXPERIENCE SEVERE WEATHER FROM A SEVERE CYCLONE EXPECTED TO MOVE KEEPING THE PORT TO THE LEFT OF ITS TRACK		White Red Red
9	**GREAT DANGER** THE PORT WILL EXPERIENCE SEVERE WEATHER FROM A SEVERE CYCLONE EXPECTED TO MOVE KEEPING THE PORT TO THE RIGHT OF ITS TRACK		Red Red White
10	**GREAT DANGER** THE PORT WILL EXPERIENCE SEVERE WEATHER FROM A SEVERE CYCLONE EXPECTED TO MOVE OVER OR CLOSE TO THE PORT		Red White Red
11	**FAILURE COMMUNICATIONS** COMMUNICATIONS WITH THE METEOROLOGICAL WARNING CENTRE HAVE BROKEN DOWN AND THE LOCAL OFFICER CONSIDERS THERE IS DANGER OF BAD WEATHER		Red

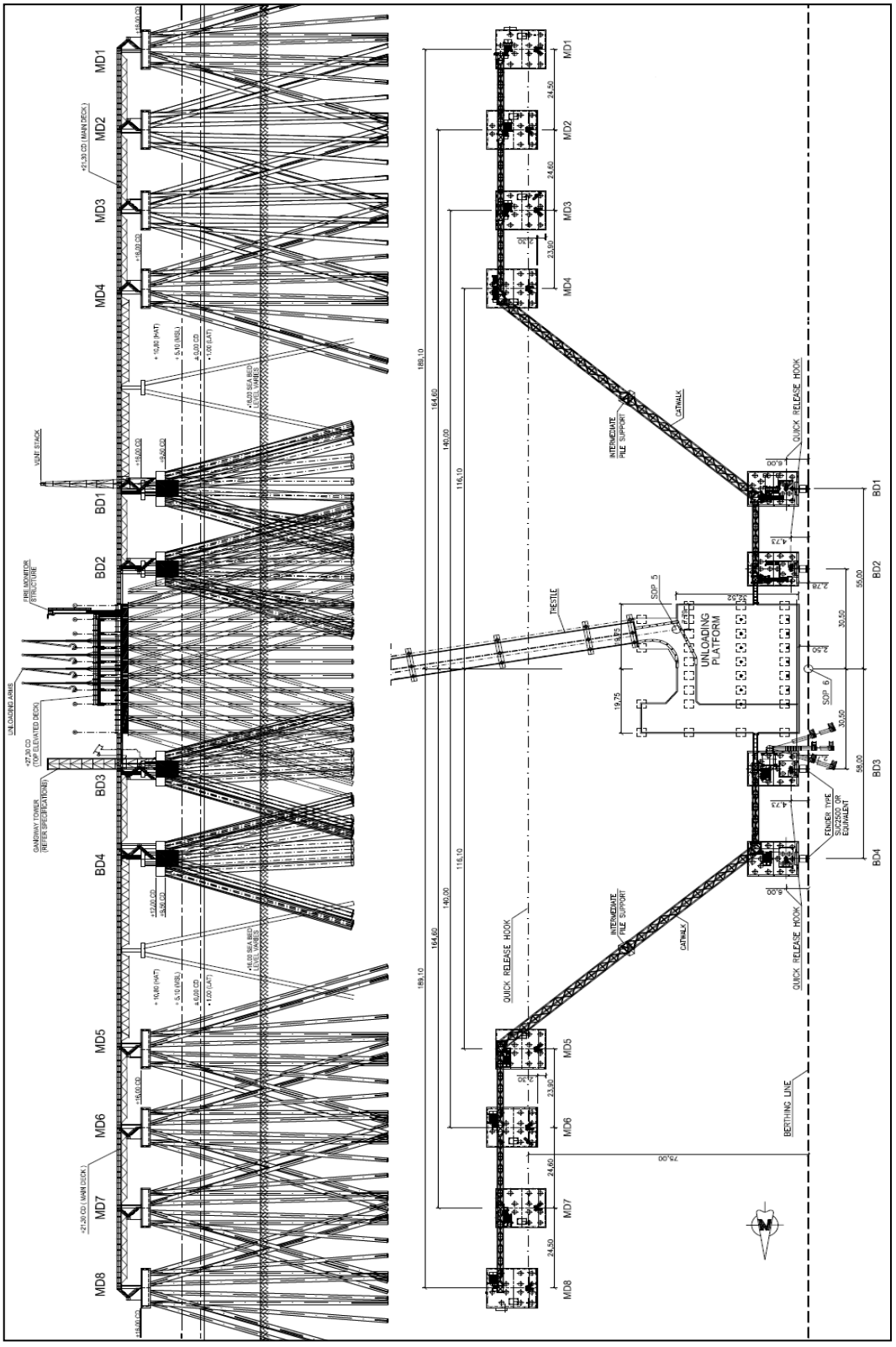
APPENDIX 12

NORTH JETTY LAYOUT



APPENDIX 13

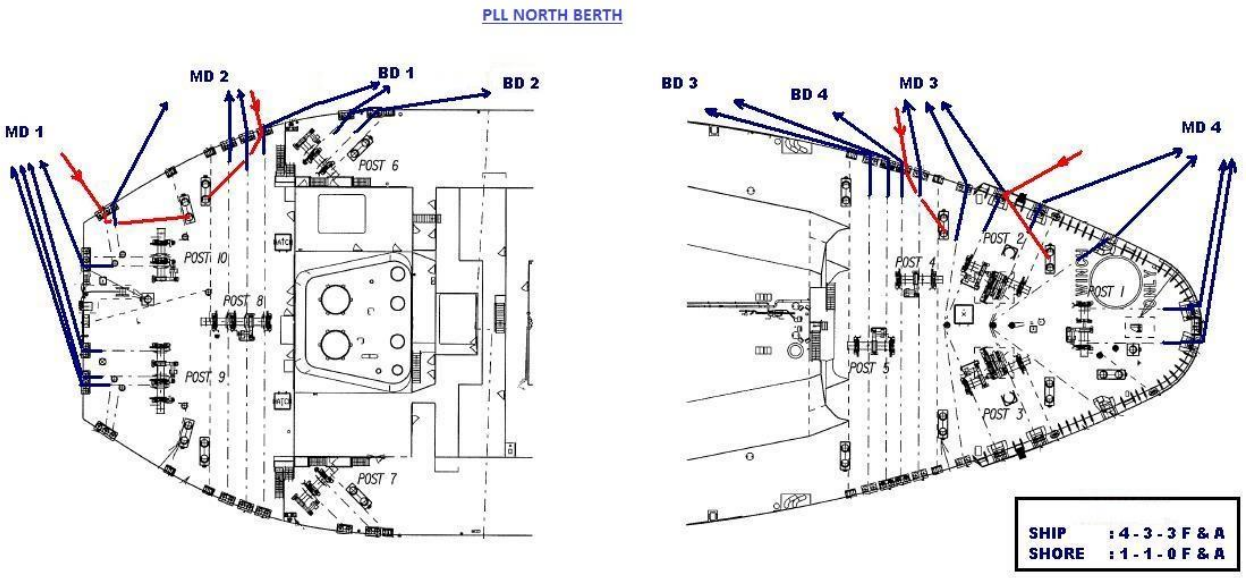
SOUTH JETTY LAYOUT

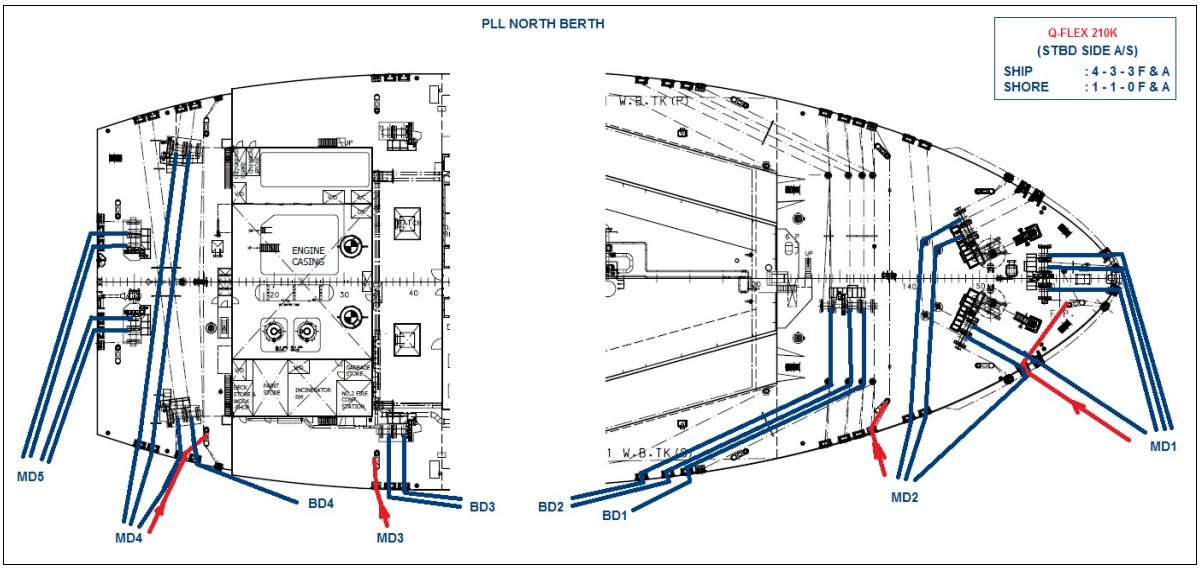


APPENDIX 14

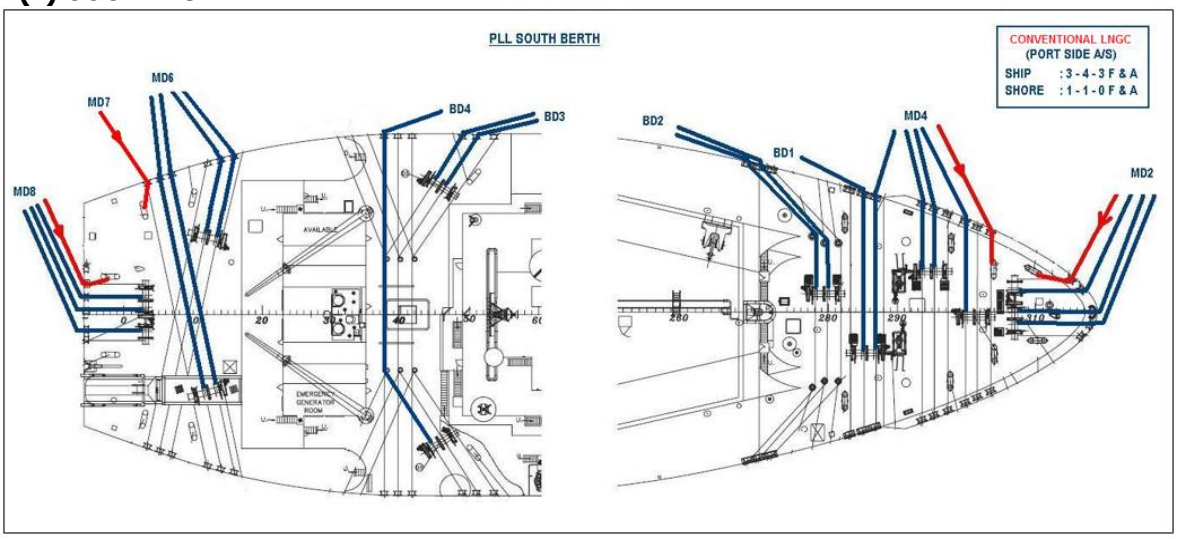
TYPICAL MOORING PATTERNS

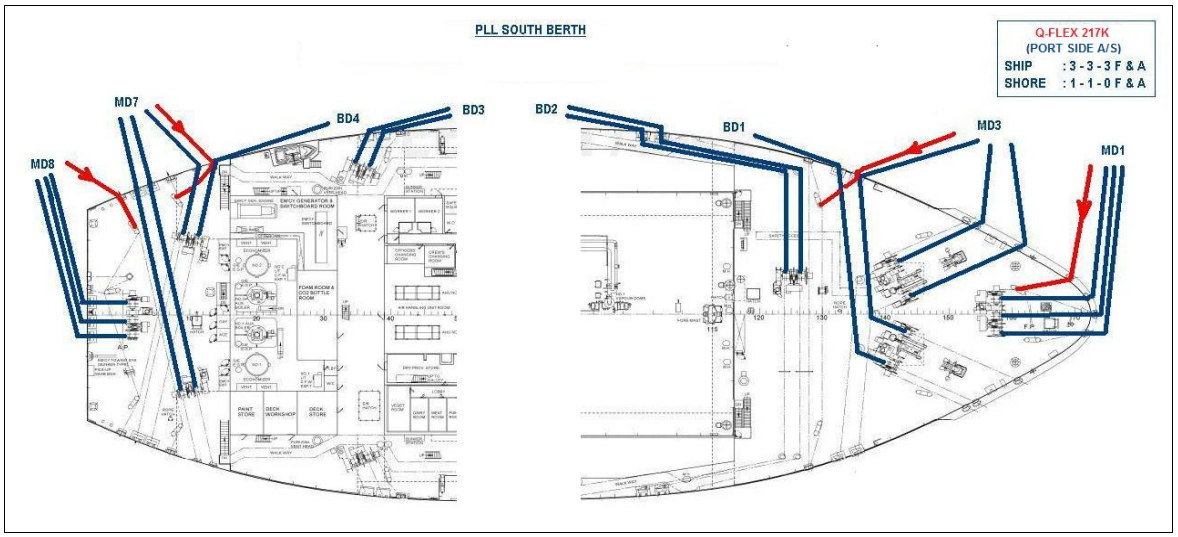
(i) North Berth

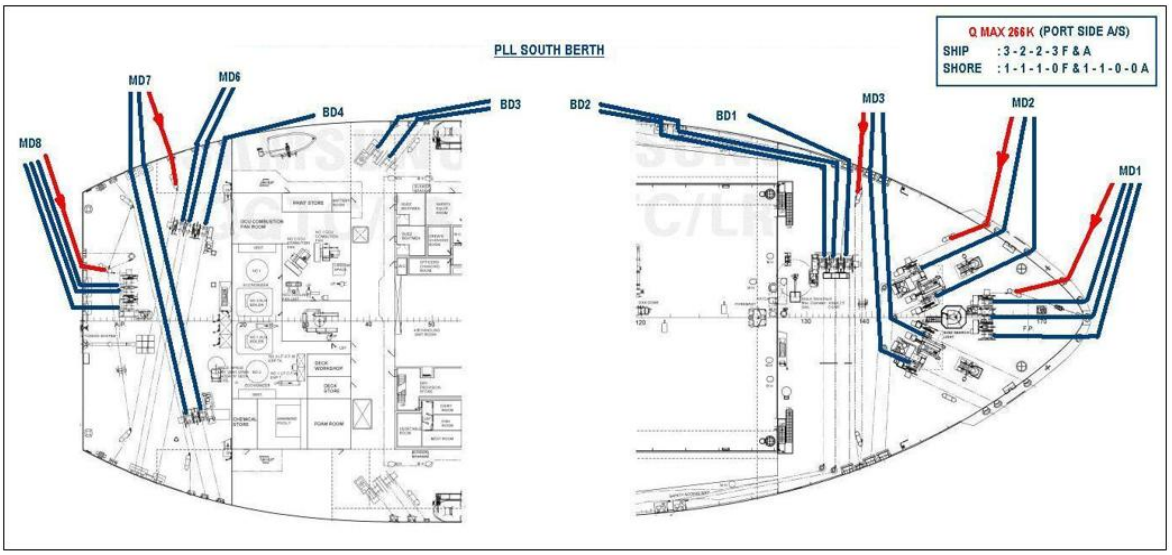




(ii) South Berth



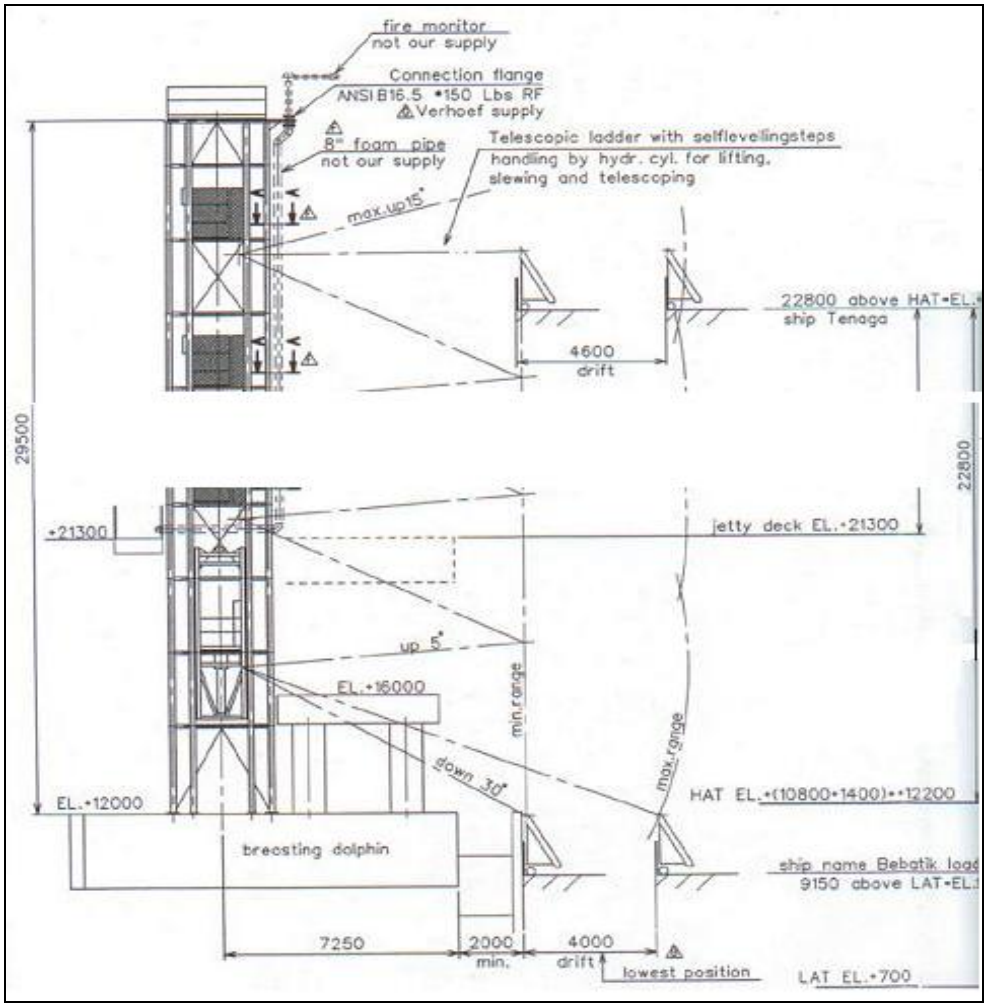


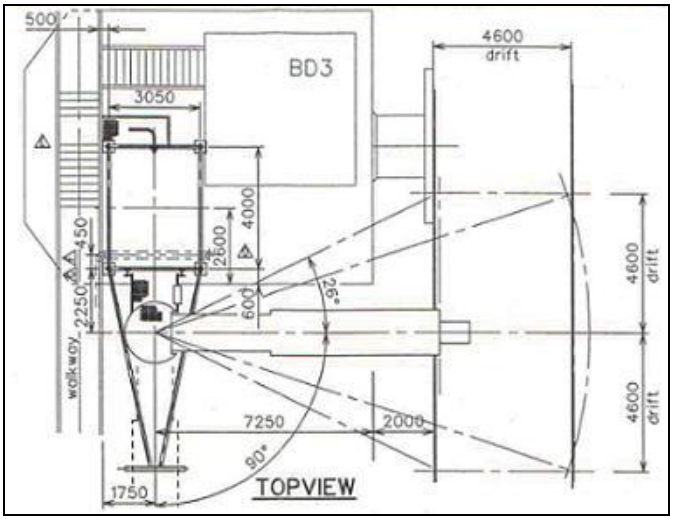


APPENDIX 15

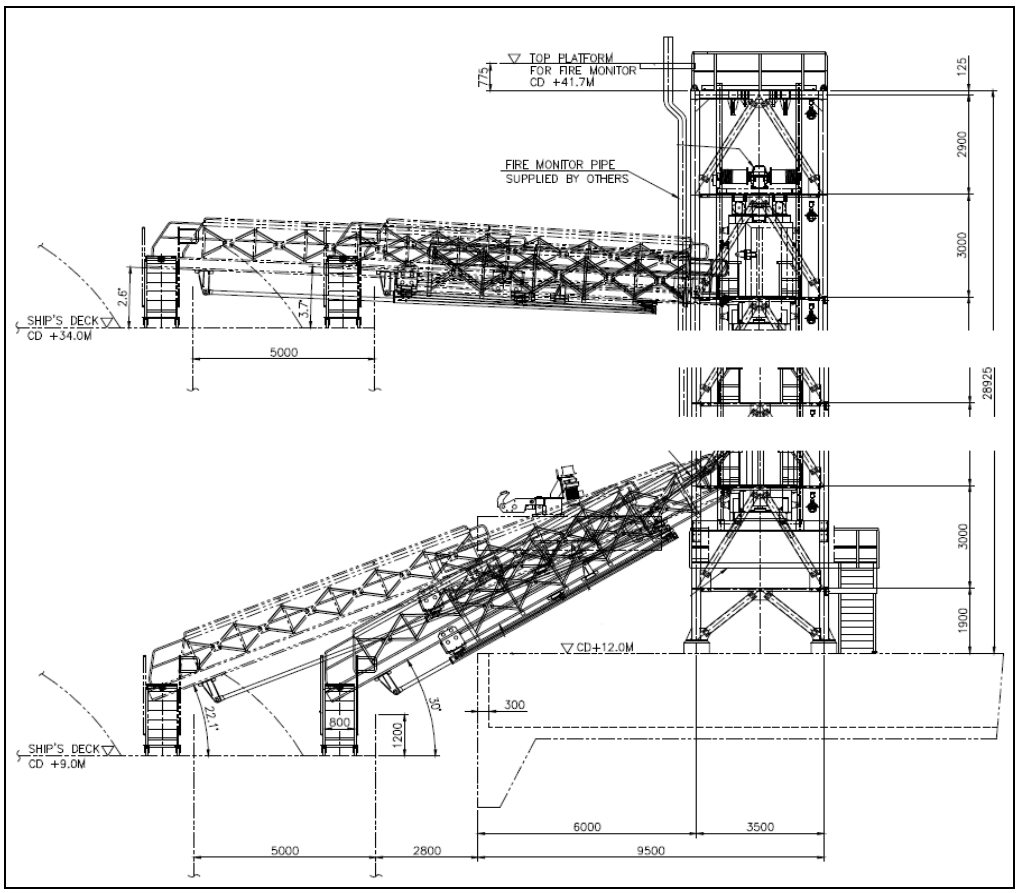
GANGWAY OPERATING LIMITS

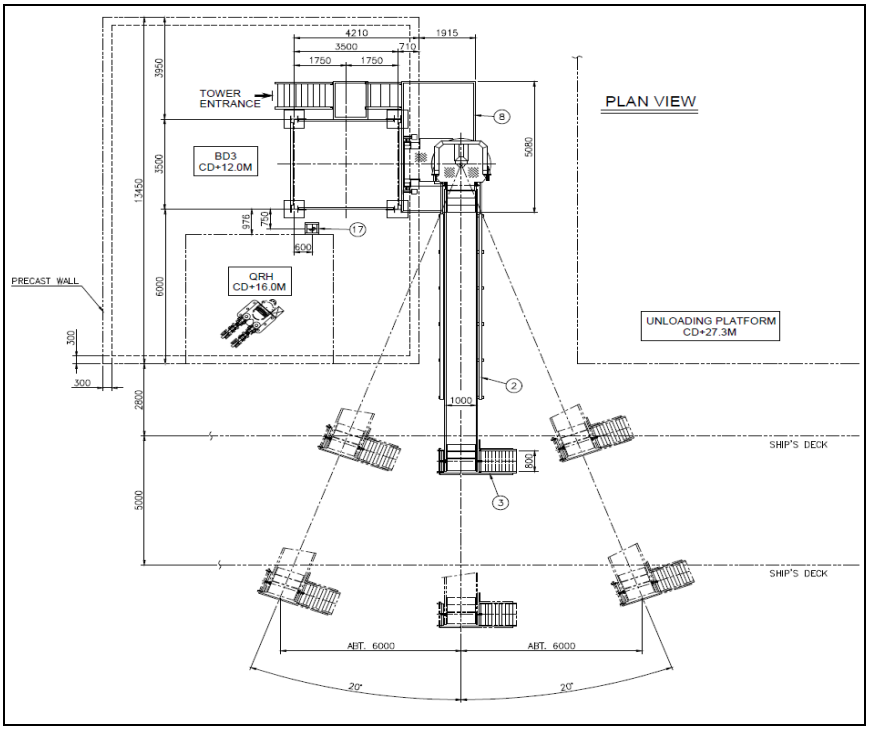
(i) NORTH JETTY





(ii) SOUTH JETTY

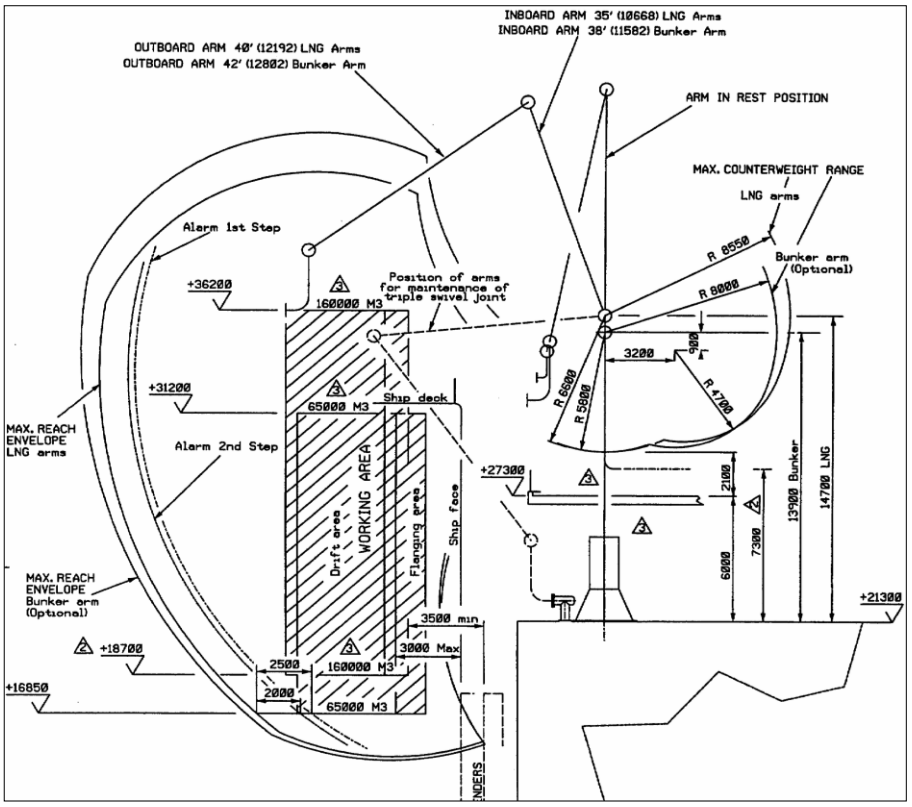


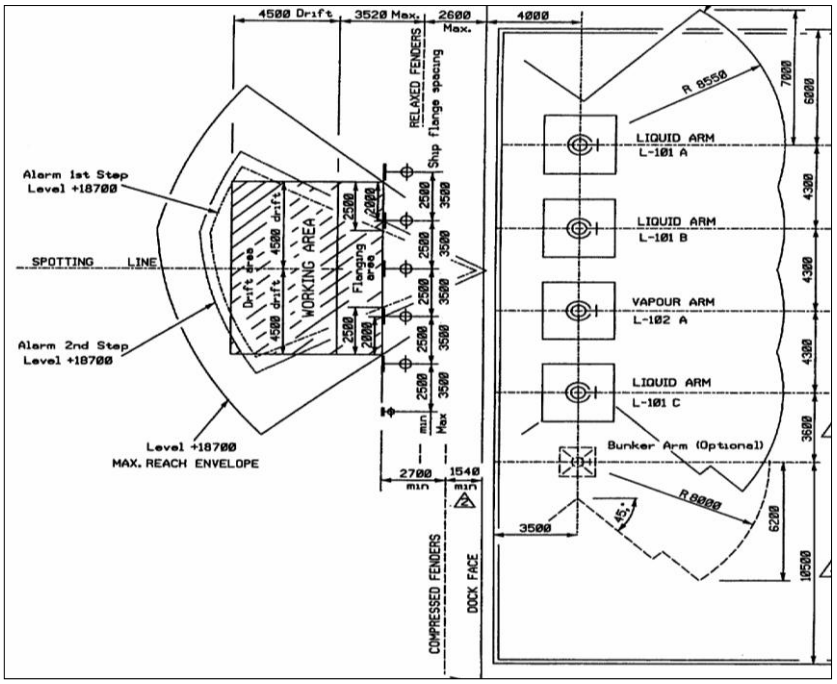


APPENDIX 16

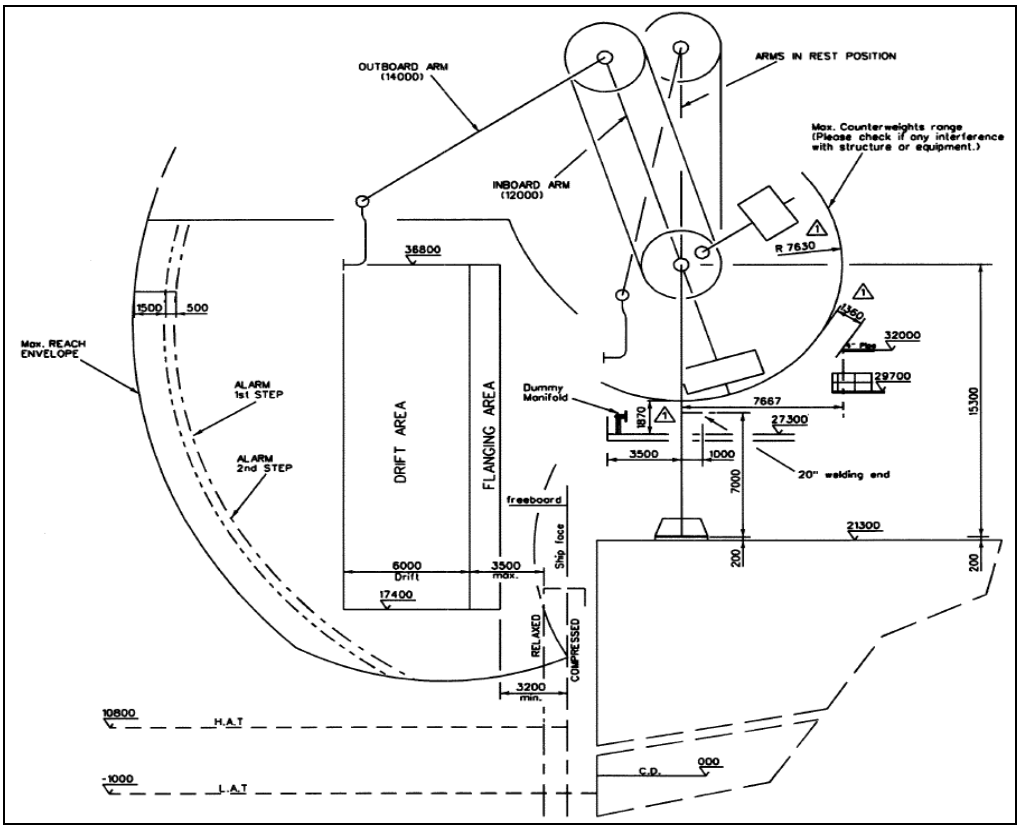
ARMS OPERATING ENVELOPE

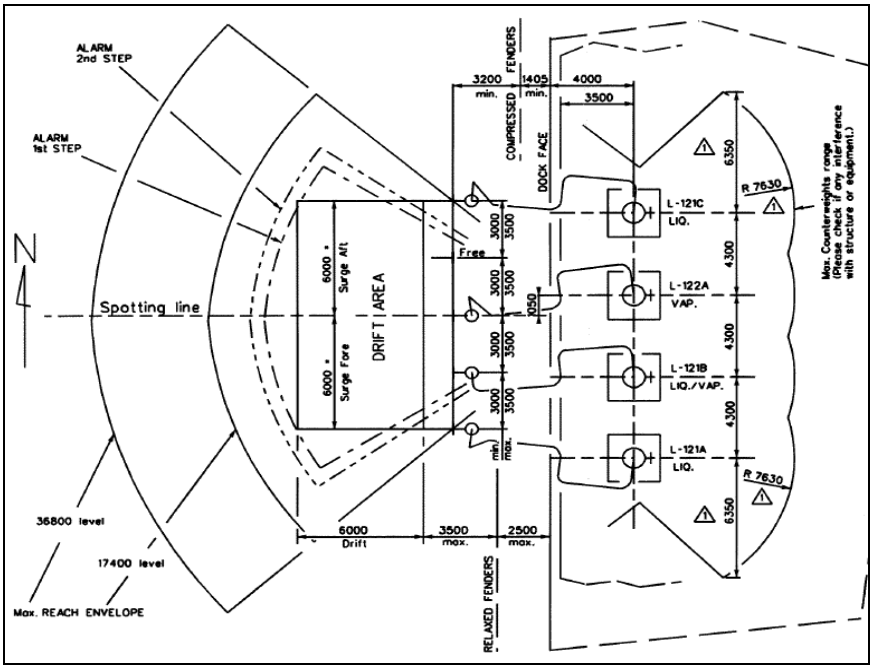
(i) NORTH JETTY





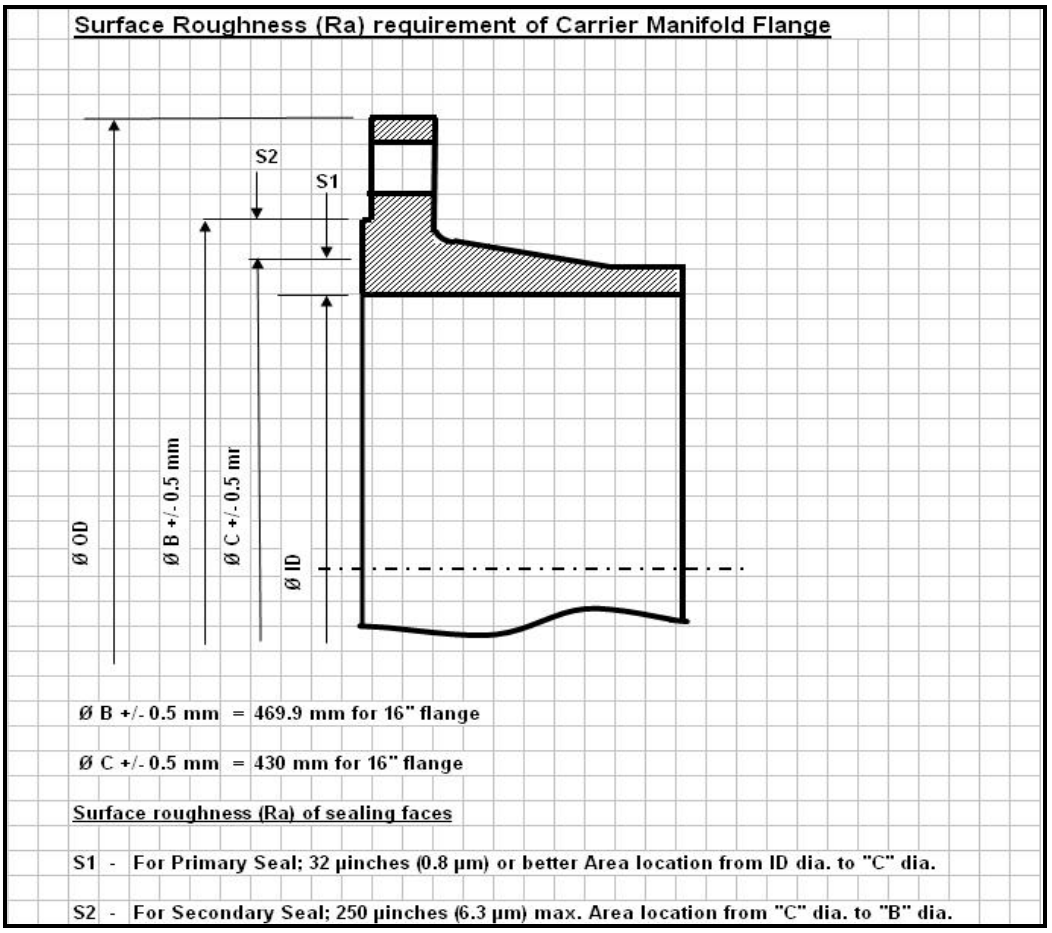
(ii) SOUTH JETTY

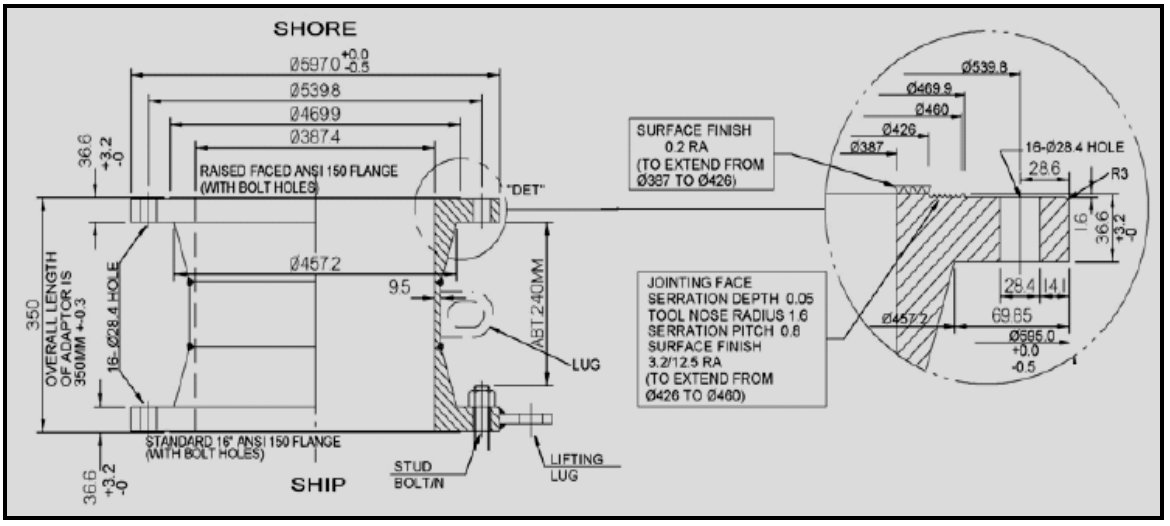




APPENDIX 17

LNG CARRIER PRESENTATION FLANGE SURFACE ROUGHNESS REQUIREMENT



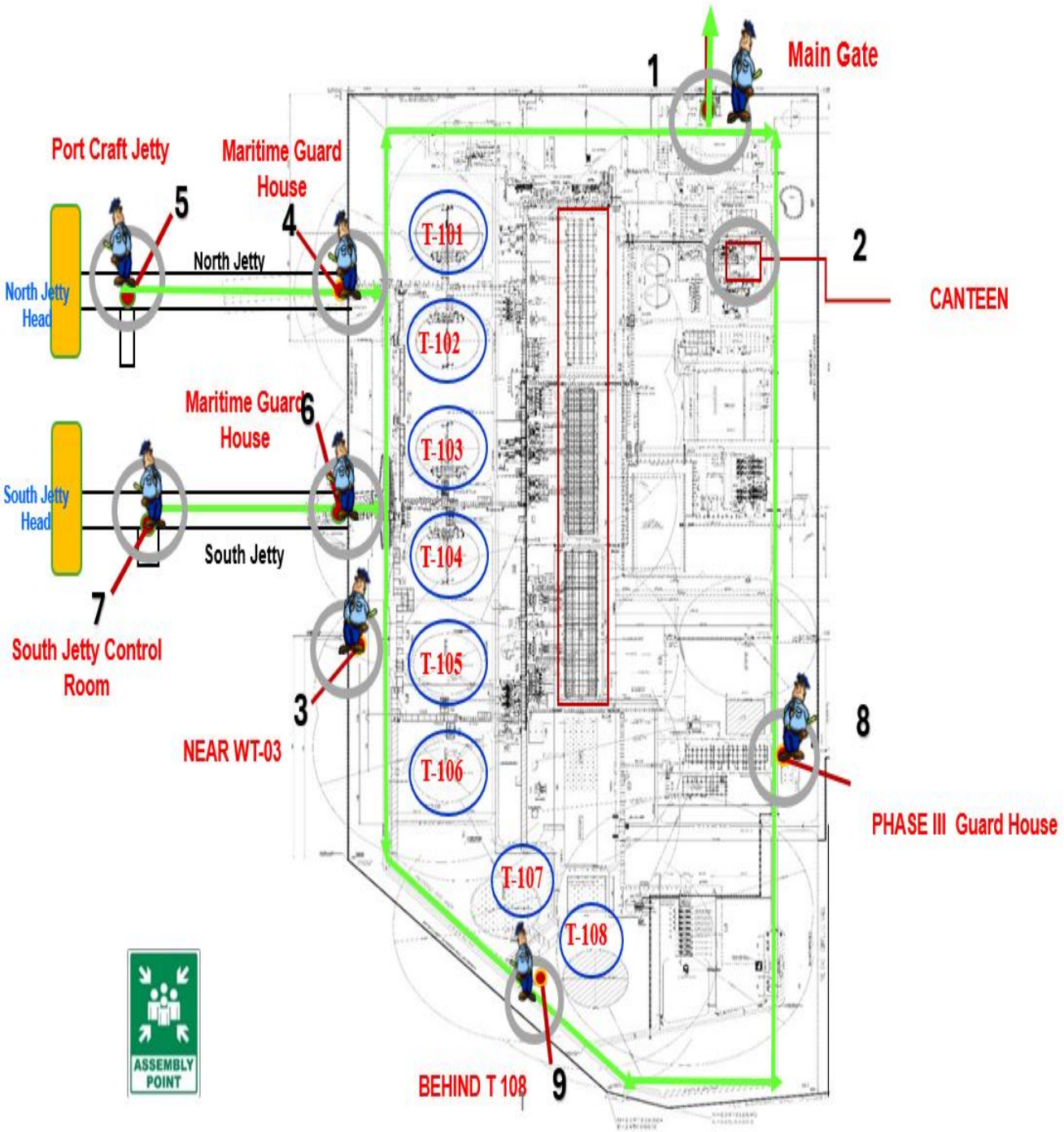


(Sample SDP drawing with dimension and surface finish specifications)

APPENDIX 18

DAHEJ LNG TERMINAL

ASSEMBLY POINTS, EVACUATION ROUTES AND EXITS



APPENDIX 19

VTS KHAMBHAT AREA DIAGRAM