



**Dhamra LNG Terminal Private Limited (DLTPL)**

# **Terminal Information Booklet**

**Version-10 (Issued June 2025)**

**Security Classification : Restricted**

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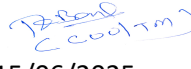
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**ABBREVIATIONS AND DEFINITIONS**

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

**Agent** - means the shipping agency appointed by the vessel's Owners/ Charterers. A local office with authority to act on behalf of the Toller or the Shipping Company to arrange port services and/or other shipping related services viz. inward / outward clearances and other liaison work on behalf of the Charterers/Owners

**APSEZ:** means M/s Adani Ports and Special Economic Zone Limited

**Approved Equipment** - means equipment of an approved design that has been tested and certified by a recognized authority (e.g. a Government Department or Recognised Organisation such as 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.

**ASD** – Azimuth Stern Drive

**BD** - means Breasting Dolphin

**BOG** – Boil off Gas

**CCB** – Central Control Building of terminal

**CCR** – means Cargo Control Room on board an LNG Carrier

**CCTV** – Close Circuit Tele Vision

**CD** – Chart Datum

**Cargo Machinery** – means any equipment used to handle the cargo operations or drive such means. Cargo compressors, cargo vaporizers, inert gas generators, their motors, control equipment, deck cranes, hose handling crane, pipelines and other cargo transferring 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.

**COU** – The Conditions of Use means an agreement or set of conditions to be agreed to by the owner or authorised operator of each LNG Vessel (that Terminal User intends to utilise to call at the LNG Terminal Facilities in connection with the receipt of LNG Terminal Services) and/or the master of each such LNG vessel with the Port Operator, in order to address certain liability, limitation of liability, insurance and related matters in connection with the use of any of the LNG Terminal facilities or facilities at the Dhamra Port by such LNG vessel

**CTM** – Custody Transfer Measurement

**Crew** - means all personnel operating and serving aboard the LNG carrier, including the Master, officers, and ratings.

**CHA** - Custom House Agent appointed by cargo importer.

**BAS** – Berthing Aid System

**DCP** – Dry Chemical Powder

**D.G. Shipping** – Directorate General of Shipping, India

**Draft** - means the depth below the waterline of the deepest part of the vessel.

**Displacement** -

Light: the weight of the vessel and its spare parts only in metric tonnes

Ballast: the weight of the vessel plus spare parts, fuels, fresh water, stores, ballast, and all personnel with their baggage; in metric tonnes

Loaded: the weight of the vessel plus spare parts, fuels, fresh water, stores, a full cargo, and all personnel with their baggage expressed in metric tonnes

**DLTPL** – means Dhamra LNG Terminal Pvt Ltd - a company engaged in receiving, storage and regasification of Liquefied Natural Gas (LNG) terminal at Dhamra (State of Odisha) comprising of a LNG Jetty situated in Dhamra Port and, as well as the Terminal management designated by DLTPL. Such management includes the person or persons his deputies and assistants, authorized by DLTPL, to exercise the powers or perform the duties in respect of making and enforcing regulations, administration, and control of the Terminal.

**DPCL** - means Dhamra Port Company Limited – a company owner and operator of Dhamra Port, Dhamra, Odisha, which is a step down subsidiary of APSEZ. DPCL is responsible for the design, construction, operation,



and maintenance of the Dhamra port including LNG berth and has given Right of Use for LNG berth to DLTPL. DPCL shall provide all marine services to DLTPL.

**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.

**Dy. PFSO** – Deputy Port Facility Security Officer

**Environmental Guidelines** - means the guidelines issued by OPCB, CPCB, MoEF&CC and 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.

**EMS** – Environment Monitoring System

**ERP** - Emergency Response Plan

**ERS** - Emergency Release System

**ERT** - Emergency Response Team

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

**ETA** - means the Estimated Time of Arrival of that LNG Carrier at the Pilot Boarding Station

**ETD** – Estimated Time of Departure

**FiFi 1** - Fire Fighting Class 1

**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.

**GIIGNL** - International Group of Liquefied Natural Gas Importers

**GMT** – Greenwich Mean Time

**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 originated by job execution party according to their area of jurisdiction and shall be counter signed by affected area party, permitting specific hot work over a specified period in a defined area.

**Hs** – Significant Wave Height

**IMO** - means the International Maritime Organization

**ISM** - means the International Safety Management Code

**ISPS** - International Ship and Port Facility Security Code

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

**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".

**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% oxygen by vol. for an LNG tanker by 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.

**LNGC or LNG vessel/tanker/ship** - means Liquefied Natural Gas Carrier which is 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. This can be used interchangeably with LNG vessel or LNG Tanker or LNG Ship

**LNG** - means Natural Gas in a liquid state at or below its boiling point at a pressure of approximately one (01) atmosphere.

**LNG Ship Standards:** The international standards and practices customarily applicable to the design, construction, equipment, operation or maintenance of ocean-going ships used to transport LNG, established by the following (which standards shall apply in the following order of priority): (i) any governmental authority having jurisdiction over the LNG Ships, (ii) the LNG Ship's Classification Society, (iii) the International Maritime Organization, (iv) SIGTTO, and (v) any other internationally recognized non-governmental agency or organization, including, but not limited to the OCIMF and in the case of (ii) through (v) above, with whose standards and practices it is customary for LNG Ships to comply; provided, however, that in the event of any conflict between such LNG Ship Standards and Legal Requirements, Legal Requirements (if stricter) shall prevail irrespective of any lack of conformity thereof with LNG Ship Standards.

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

**LNG Exclusion Zone** - means that area in which no other vessel using the Port may enter.

**LOA** - means the length overall of the vessel.

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

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

**Master or Vessel 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.

**MD** - means Mooring Dolphin

**MLA** - means Marine Loading Arms

**MLMS** – Mooring Load Monitoring System

**Monsoon** – Refers to the Southwest monsoon of Bay of Bengal, and the weather conditions prevailing during such monsoon period. For the purpose of this booklet, period from 01<sup>st</sup> day of May to 30<sup>th</sup> day of Nov of a year will be considered as monsoon period.

**MSL** – Mean Sea Level

**Non-monsoon** - Refers to that period of a year which is outside the monsoon period.

**NM** – Nautical Mile

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

**NOR** – Notice of Readiness

**NOA** – Notice of Arrival

**OCIMF** - means the Oil Companies International Marine Forum

**OOW** – means Officer on Watch

**OSCP** – Oil Spill Contingency Plan

**PANS** – Pre-Arrival Notification of Security

**P & I** – Protection and Indemnity Insurance

**PMS** – Position Monitoring System

**PC** – Port Clearance

**PERC** – Powered Emergency Release Coupler

**PFSP** – Port Facility Security Plan

**Port Limits** - means Dhamra Port limits as notified by the Govt. of Odisha

**PPE** - means Personal Protective Equipment

**PAQ** – Pre-Acceptance questionnaire

**Permit to Work** - means a document originated by job execution party according to their area of jurisdiction and shall be counter signed by affected area party (LNGC or DLTP) permitting specific work to be performed during a specified period in a defined area under strict safe conditions.

**PIB** – means Port Information Booklet

**Port Authority** - means Dhamra Port Company Ltd

**Port** - means the Dhamra Port area under the jurisdiction of Govt of Odisha.

**Port Area** - means the area of land and water enclosed by the Port Limits, the Port security fence and boundary walls as relevant.

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

**Port Tariff** - means those dues and charges levied by the Government Authorities and Port Operator for usage of the Port of Dhamra and ancillaries.

**Port Operator** - means Dhamra Port Company Limited or any successor responsible for administration and control of the Port. It includes the person or persons, his deputies and assistants authorized by DPCL, to exercise the powers or perform the duties in respect of making and enforcing regulations administration and control of the Port.

**Port Regulations** - means latest version of Port Rules stipulating the information and regulations of Dhamra Port, Odisha, India.

**PSS** – Port Signal Station which is the Port's control room managed by Port Operator, having communication facilities and other equipment for monitoring, and ensuring the safe Vessel movement within Port Limits.; It is the contact point for all vessel's arrival /departure Including LNG vessels and is 24 hrs manned station on VHF Ch. 14/16.

**QRA** – Qualitative Risk Assessment

**QRMH** – Quick Release Mooring Hook

**QCDC** – Quick Connection Disconnection Coupling

**RLNG** - means gas derived from the conversion of LNG from its liquid state to a gaseous state.

**SIRE** – Ship Inspection Report Programme

**SBT** - means Segregated Ballast Tank

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

**SOP** – Standard Operating Procedure

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

**SSCS** – Ship to Shore Compatibility Study

**SWL** - Safe Working Load

**Terminal Regulations** - means these regulations & specific terminal manuals together with their attachments and any amendments or modifications attached thereto.

**Terminal Operator** - means DLTPL representative/supervising/engaged in the LNG unloading/loading from the LNG Tanker and regasification operation for evacuating the natural gas to the Users.

**Terminal User** – means the Hirer who have entered into a Terminal Use Agreement with DLTPL

**TIB** - means Terminal Information Booklet

**Terminal Manager** - means such individual with day-to-day primary responsibility for managing the entire Terminal or his designee .

**Terminal** - means Dhamra LNG Terminal which includes the LNG berth, its infrastructure, topside equipment & fittings, cargo equipment and fittings for reception, storage, regasification of LNG and send out of HPNG to the Gas grid.

**Trim** - means the difference between the forward and after drafts.

**TC** – Turning Circle

**Tp** – Time Period

**UKC** – Under Keel Clearance

**VDN** – Vessel Deficiency Note

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

**Vessel Operator** - means any person or company that owns or operates LNG vessel which makes a cargo delivery to the Terminal.

**VHF** – Very High Frequency

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**REFERENCE DOCUMENTS**

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This TIB is to be read in conjunction with the publications from following Associations, Organisations as relevant:

- i. OCIMF publications including The International Safety Guide for Oil Tankers and Terminals (ISGOTT), 6<sup>th</sup> Edition, 2020 - ICS/OCIMF/IAPH
- ii. SIGTTO publications including "Liquefied Gas Handling on Ships and in Terminals, 4<sup>th</sup> Edition, 2016
- iii. Tanker Safety Guide (Liquefied Gas), 2<sup>nd</sup> Edition, 1995 - ICS
- iv. LNG Operations in Port Areas, 1<sup>st</sup> Edition, 2003 - SIGTTO
- v. ISO17177:2014, Guidelines for Marine Interfaces of Hybrid LNG Terminals
- vi. GIIGNL - International Group of Liquefied Natural Gas Importers
- vii. Mooring Equipment Guidelines (MEG4), 4<sup>th</sup> Edition 2018
- viii. Effective Mooring, 3<sup>rd</sup> Edition
- ix. OCIMF "Guidelines and recommendations for the safe mooring of large ships at piers and Sea Islands"
- x. PIANC - Permanent International Association of Navigation Congresses guidelines
- xi. Merchant Shipping Act, 1958 including latest amendments; M.S Notices, Orders and Circulars in force issued by D.G.Shipping of India
- xii. Indian Ports Act
- xiii. SOLAS Convention (International Convention for the Safety of Life at Sea),
- xiv. MARPOL (International Convention for the Prevention of Pollution from Ships),
- xv. STCW (International Convention on Standards of Training, Certification and Watchkeeping for Seafarers),
- xvi. ISPS Code (International Ship and Port Facility Security Code)
- xvii. DPCL Port Information Booklet
- xviii. IMO publications as applicable
- xix. Ballast Water Management Convention and BWMS Code, 2018
- xx. ICS (International Chamber of Shipping)
- xxi. IGC Code (International Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk)
- xxii. ISM Code (International Safety Management Code)
- xxiii. Any other document as relevant (for e.g., Port Operations Manual)

## TERMINAL HSE POLICY



### Health, Safety & Environment Policy

Dhamra LNG Terminal Private Limited (DLTPL) is committed to identify & minimize risks that can harm people, the environment, assets or reputation, in pursuit of its business objectives. In doing so, DLTPL seeks to establish and maintain its reputation as a caring and prudent operator.

To meet this commitment, DLTPL will implement management systems as part of operational excellence, that strive to:

- Ensure that our operations comply with all statutory requirements related to health, safety and environment.
- Implement controls to protect personnel, involved directly or indirectly in our activities, from any physical injury and to prevent pollution while using material and energy efficiently.
- Promote a culture wherein employees freely share their commitment and participate to achieve HSE goals.
- Ensure all major process safety risks are identified and mitigated through several robust barriers. Process safety communication will be disseminated to operations personnel and senior management or to the board as required.
- Ensure that contractors are aware of the policies and standards and where necessary, coach and mentor them to the required HSE standard.
- Foster a proactive culture where accidents, incidents and near misses are reported and investigated transparently and the lessons learned are shared throughout the organisation for continuous improvement.
- Monitor HSE performance and conduct regular audits to ensure the controls are effective and that HSE goals are being achieved.
- Ensure a robust emergency preparedness and contingency planning is in place to manage an abnormal event in a timely and effective manner.
- Ensure that all working personnel are subjected to a periodic fitness to work assessment process for carrying out work safely and to diligently deliver their duties as desired.
- Play a leading role to promote best practices in the industry.
- Contribute to the societies where we operate and be a responsible neighbour.

This policy shall be applicable to employees and contractors working in DLTPL offices and sites.



SP Singh  
(Chief Executive Officer, DLTPL)

March 2021

## 1. INTRODUCTION AND GENERAL INFORMATION

### 1.1 PURPOSE AND OBJECTIVE

#### 1.1.1. Purpose

This booklet, covering LNG unloading operations at the DLTPL Terminal, was developed in accordance with the recommendations of Society of International Gas Tanker and Terminal Operators (SIGTTO), the International Maritime Organization (IMO), Oil Companies International Mooring Form (OCIMF), International Group of Liquefied Natural Gas Importers (GIIGNL), International Ship and Port facility Security (ISPS) conventions and with the Terminal's operating standards. This manual provides key information to users of DLTPL Terminal and visiting LNG carriers to comply with the provisions of this Booklet. This booklet serves for the benefit of Terminal Users, LNGC operators, Vessel Masters, DPCL Port Authority, and ship's agents.

#### 1.1.2. Objective

This manual provides important information on the LNG marine terminal and its approach channel as follows: -

- Provides general information about the terminal location, berth features, capabilities, cargo handling, and vessel's berthing & unberthing criteria and all the operations practices.
- Provides the terminal user and LNG carrier's Master with supplementary information necessary for conducting the Ship-shore Compatibility study.
- Provides the technical information about the terminal and overview of equipment & fittings installed on the LNG berth, its mooring arrangements and cargo transfer systems.
- Provides all safety instructions/procedures, accident preventions and all emergency procedures.
- Provides details of exclusion zone, security protocol standards as per ISPS.
- Define the standards that the LNG Carriers must comply with; to be subjected to the Compatibility Study Process for acceptance by the Terminal.

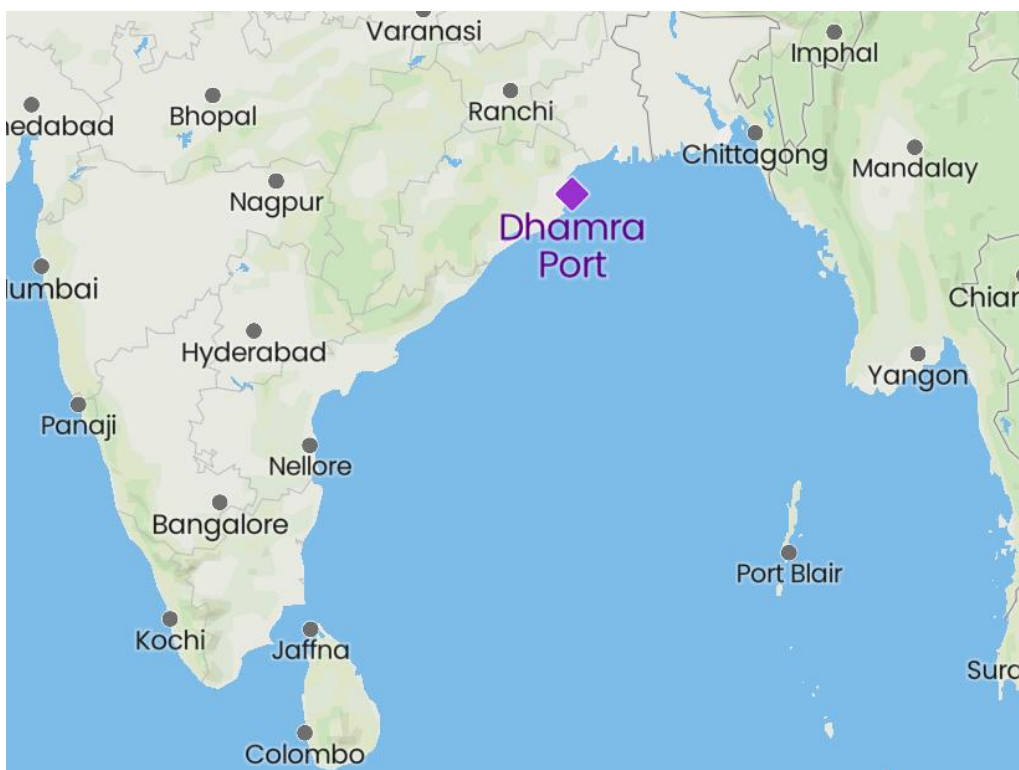
### 1.2 PORT INFORMATION / LOCATION

The Dhamra Port is a port in Bhadrak district, Odisha, India, on the shore of the Bay of Bengal about seven kilometres from the old port of Dhamra. Dhamra LNG Terminal is located at northwestern reaches of Dhamra Port between the mainland and the lee of Kanika Sands and comprises of one jetty. LNG berth can accommodate LNG carriers from 40,000 m<sup>3</sup> up to 2,66,000 m<sup>3</sup>.

Dhamra LNG Terminal Private Limited (also referred to as Terminal or Facility) is located inside Dhamra Port under a Terminal service agreement executed between The Dhamra Port Company Limited (DPCL) and Dhamra LNG Terminal Private Limited (DLTPL). Dhamra LNG Terminal Pvt Ltd (DLTPL) - is a company owning liquefied natural gas (LNG) receiving, storage and regasification terminal at Dhamra Port.

This port, established in 2010 owned by Adani Ports and Special Economic Zone Limited (APSEZ) and operated by DPCL, is engaged in export & import of cargos and is capable of handling Bulk carriers up to cape size, general cargo, and LNG carriers. DPCL is responsible to provide marine and port services to DLTPL. DLTPL is responsible for LNG cargo operations including cargo transfer, storage, handling, regasification, and NG send out in the transmission line for end receipt by the terminal users.





**Location:** Lat: 20° 49.4' N Long: 86° 57.766' E  
**United Nations Location Code:** IN DMQ  
**Nearest Major City:** Bhubaneswar  
**Time Zone:** GMT (+) 5.5 hours

## 1.3 PORT LAYOUT AND BATHYMETRY

### 1.3.1. General

The Port is protected at its entrance by a natural breakwater on the Northern side. Currently the Port has Five (05) berths, three (03) turning circles [Old TC (600 metres diameter), New TC (600 metres diameter)], LNG TC (630 metres diameter) and an access channel. LNG TC is to be exclusively used for LNG Vessels which is adjacent to the LNG berth.

**Refer to Annexure A and PIB for the Reference Chart & the layout of the Port.**

### 1.3.2. Port Limits

As per the notification issued by the Government of Odisha, the Dhamra Port limits are as stated below (as per WGS-84 datum):

Position	Latitude	Longitude
<b>A</b>	20° 48' N	086° 56' E
<b>B</b>	20° 48' N	087° 02' E
<b>C</b>	20° 56' N	087° 16' E
<b>D</b>	20° 56' N	086° 55' E
<b>E</b>	21° 02' N	087° 13.5' E



### 1.3.3. Bathymetry

The outer approach channel has a minimum water depth of 18.3 meters (2021) while inner approach channel has a minimum water depth of 17.0 meters (2021).

The minimum depth of LNG basin is CD-15.0 m including berth pocket. The depths are monitored regularly and maintained by the dredging department of DPCL. Bathymetry is carried out once every month. Arriving vessels, if in doubt, may verify the latest depth from Dhamra Port Control on arrival or during Master Pilot Information Exchange.

### 1.3.4. Conservancy

The jurisdiction of the Port is under the Directorate of Port & Inland Water Transport, Odisha, the statutory body of State Government of Odisha, responsible for management, control, and administration of ports in Odisha state.

### 1.3.5. Age of the Vessel

The maximum age of LNG vessel acceptable in this port is 25 years provided vessel more than 15 years age is certified with at least **CAP 1 rating for Hull and CAP 2 rating for Machinery and Cargo System from a Classification society recognised by Govt. Of India**. Vessels more than 25 years age may be considered on case-by-case basis at the sole discretion of port and the terminal. Vessels of age 30 years and above are not acceptable at the terminal and DPCL Port.

## 1.4 DISCLAIMER

Everything in this document is correct as on the day of its publication. With respect to the use of any part of the Terminal, the terms of any licence/permission made available by DPCL will take precedence. Following document of Port Control (DPCL) is to be referred in addition to this information booklet: -

- Port Information Booklet (Dhamra Port company limited) – Latest edition

However, the information contained herein may be reviewed periodically by DLTP, being the terminal owner, as per dynamic operational & project requirements. DPCL keeps all the information furnished by them updated and changes recorded.

**N.B. Users of this Manual are requested to use the Latest Version of this Manual.**

## 2. OVERVIEW OF TERMINAL FACILITIES

### 2.1 LOCATION OF LNG TERMINAL

This terminal consists of only one berth (LNG Berth) and is located at the Northern side of the harbour area. The Port management and marine services are provided by DPCL, however onus of the management of terminal operations is exclusively on DLTPL. **Refer to Annexure B for the layout and photograph of the LNG jetty.** Hereinafter, Dhamra LNG Terminal Private Limited would be referred to as “Terminal” in this document.

### 2.2 LNG TERMINAL DESCRIPTION

Dhamra LNG Terminal Private Limited (hereinafter referred to as “DLTPL”) has developed an LNG regasification terminal at Dhamra Port, India. The terminal’s capacity is 5 MMTPA with provision to expand to total 10 MMTPA nominal capacity i.e., 5 MMTPA at the present phase (Phase 1) and additional 5 MMTPA in the future expansion phase of the project (Phase 2). LNG for this plant will be sourced by terminal users from various potential suppliers through LNG Carrier (LNGC) and will be unloaded into two LNG storage tanks of net capacity 180,000 m<sup>3</sup> each. The Project site is close to the estuary of the Dhamra River near the village of Chandbali. Village Dhamra is located approximately 110 km North of Paradip and about 200 km by road from the state capital of Bhubaneswar.

DLTPL has a captive jetty exclusively for DLTPL Terminal use. The Terminal comprises of LNG berth fitted with berth components operated and maintained by DPCL, DLTPL’s onshore cargo equipment & fittings etc. necessary for terminal operation, storage tanks and regasification plant on the land capable of regasifying LNG and sending out High Pressure Natural gas through the pipeline to end users. LNGCs will berth alongside this terminal and carry out safe transfer of LNG to the storage tanks installed ashore.

#### Terminal’s facilities:

- Jetty inclusive of Breasting and mooring dolphins; Catwalks connecting Dolphins;
- Main Service platform having MLAs, Sampling system etc.
- Trestle connecting onshore facility to the berth; Connecting cryogenic pipeline;
- 2 storage tanks of 180,000 m<sup>3</sup> capacity each
- Regasification facility (STVs- Shell & Tube Vapourisers, SCVs, HP Pumps Air Heaters, Recondenser, GW pumps. Etc.
- Firefighting Facilities; GEG; Utilities

### 2.3 LNG BERTH DESCRIPTION

This berth of overall length 400 metres consists of a service platform which is connected by a trestle 1.65 kilometres long westwards to the shore, 4 set of marine loading arms available viz. 2 nos. liquid arms for LNG transfer, 1 no. Hybrid arm and 1 no. Vapor return arm installed on main service platform. The orientation of the berth is 016° – 196° aimed at LNGC to stay aligned to the general direction of waves.

#### Refer to Annexure C for LNG Berth layout.

To the North of the service platform there are two (02) Breasting Dolphins (BD#1 & 2) and three (03) Mooring Dolphins (MD#1, 2 & 3). To the South of the service platform there are two (02) Breasting

Dolphins (BD#3 & 4) and three (03) Mooring Dolphins (MD#4, 5 & 6). A gangway tower with hydraulically operated telescopic gangway is located on BD#3.

#### **2.3.1. Service Platform**

Service platform is of dimension 25 metres x 53 metres. It connects to trestle on the side towards shore. Service platform houses foundations for LNG and vapour arms, various equipment & fittings, Sampling unit and Fire protection appliances.

#### **2.3.2. Mooring and Breasting Dolphins**

There are six (06) Mooring Dolphins (MDs) numbered MD#1 to MD#6 and four (04) Breasting Dolphins (BDs) numbered BD#1 to BD#4. All MDs are located at an offset of 50 metres from Berthing Line and are fitted with 3 QRMH each. All BDs are also fitted with 2 QRMH each.

#### **2.3.3. Fender Structure and Location**

There are four (04) numbers fitted, one on each BD. Fenders are Cone type and can handle vessels up to Q-Max size. The faces of fenders form Berthing Line.

#### **2.3.4. Telescopic Access Gangway**

A gangway tower with hydraulically operated telescopic gangway is located on BD#3 which is 25.5 m southward of spotting line. The gangway is capable of being operated by control panel by a designated operator.

### **2.4 LNG SAFETY ZONES**

#### **2.4.1. Exclusion Zone**

An exclusion zone is the area of defined limits which is prohibited for certain ships to stay far enough offshore to allow sufficient time for prevention of disabled ship from touching shore/facility and to protect the coastline/facility from any pollution/potential hazardous occurrence caused by the casualty. Access to the Exclusion Zone is restricted exclusively to LNG Carriers calling at the Terminal, mooring and service support vessels, either working for or authorized by the Terminal and the Port.

#### **2.4.2. Safety Exclusion Zone**

It refers to a circular zone of 125 m radius from the location centred at the LNG transfer platform. This exclusion zone is as per QRA done for this LNG facility. This is the location of maximum probability of fire in case of potential leak of hydrocarbon i(e.g. spill case). Any movement of vessel/crafts is strictly always prohibited within this zone.

#### **2.4.3. Security Exclusion Zone**

It refers to a circular zone of 281 m radius seaward side from the location centred at the Jetty Head in line with LNG industry practice. DPCL ensures that no unidentified and unauthorized craft comes within this zone and ensure all security measures as per the provisions of ISPS code and the PFSP.

### **2.5 TUGS**

A minimum of four (04) tugs are available for all LNGC arrivals and departures and 2 tugs (Dolphin 31, Dolphin 32) have firefighting capability of **FiFi-1 (IRS AGNI-1)** notation. Details of tugs can be found in the DPCL Port Information Booklet.

## 3. LNG BERTH SPECIFICATIONS AND INFORMATION

### 3.1 DESCRIPTION OF BERTH AND DETAILS OF EQUIPMENTS & FITTINGS

#### 3.1.1. Berth Data

The jetty of longitudinal span 400 metres (MD#1 to MD#6) consists of a main service platform (25 m x 22.4 m), trestle Southwards of 1.65 KM length, a Jetty Control Room (JCR), and Jetty Security Post (JSP) on the shore side of trestle. The main service platform has two level vis. (+)10.4m CD (lower Deck) and (+)17.5m CD (upper deck).

The top deck of the platform accommodates unloading arms (3 nos. of Liquid loading arms and 1 vapour arm), auxiliary equipment for operation, control room, firefighting facilities etc.

A total 4 (four) numbers of breasting dolphins and 6 numbers of mooring dolphins. All dolphins are at a level (+) 6.0 m CD, except Mooring Dolphins (MD#3 & MD#4) which are at (+) 9.0m CD. Catwalks connect all the dolphins to provide access across the berth.

To the north of service platform there are two (02) Breasting Dolphins (BD# 1 & 2) and three (03) Mooring Dolphins numbered MD#1 to MD#3. To the South of service platform there are two (02) Breasting Dolphins (BD# 3 & 4) and three (03) Mooring Dolphins numbered MD#4 to MD#6. Refer to below table for important dimensions of the berth:

Particulars	Berth Data
Max. length overall	400 metres
Water depth at the jetty	(-) 15 m CD
Vessel size permitted	40,000 m <sup>3</sup> to 2,66,000 m <sup>3</sup>
Max Arrival Displacement	1,80,000 MT
Max permissible beam	55.0 m
Max. height of Cargo manifold for MLAs	CD + 30.64 metres
Orientation of jetty	016° – 196°
Max. Permissible draft	12.5 metres
Design berthing velocity	0.10 m/s @ max 10° to berthing line

Visiting LNG carriers will berth either Port Side alongside or starboard side alongside to LNG jetty depending upon state of tide and associated metocean parameters and will be confirmed 48 hours prior scheduled berthing of the vessel.

#### 3.1.2. Equipment and Fittings

##### i. Fendering Arrangement

There are four (04) permanent cone fenders fitted one on each BD, of the capped steel piled berth, the details of which is as under:

Particulars	Details
Make	IRM Offshore & Marine Engineers Pvt Ltd
Model	DIPTI Cone Fendering System
Type	DCN-2000R3

<b>Fender Frontal frame size</b>	5.10 m x 3.50 m
<b>Fender Contact Size</b>	4.75 m x 3.30 m
<b>C/L Height</b>	(+) 4.0 m CD
<b>Fender Height</b>	(+) 0.9 m CD to (+) 6.0 m CD (5.1 metres)
<b>Contact Area</b>	15.675 m <sup>2</sup>
<b>Reaction Force (Max)</b>	2846 KN +/- 06%
<b>Energy Absorption (Max)</b>	3401 KN-m



Location of fenders on LNG jetty

## ii. Berthing Aid System (BAS)

LNG berth is equipped with BAS installed near MD#3 and MD#4. DLD (Digital LED Display) shows only the broad-side end distances forward and aft and approach speed forward and aft.

**Approach speed and berthing angle of ship from the berth lay shall not exceed zero decimal one zero (0.10) metres/sec & ten degree (10°) respectively at the time of vessel's first landing onto the fenders.**



The laser operated system provides both "Bow" and "Stern" transverse relative speed of Ship and her distance off the berth. Pilot is provided with handheld unit displaying approach angle, speed, and weather parameters.

## iii. Quick Release Mooring Hooks (QRMH)

Each Breasting Dolphin (BD#1 to BD#4) is equipped with twin hook QRMH assembly, all Mooring Dolphins (MDs#1, 2, 3, 4, 5 & 6) are equipped with triple hook QRMH assembly.

The SWL of each mooring hook is 150 tons and of make Trelleborg. Each QRMH assembly is fitted with a mooring capstan having line handling speed of 20 metres/min when hauling 1.5 tons of tension

load. A Load cell is incorporated in each mooring hook for sensing the tension in Ship's mooring lines. QRMH can be released locally, manually & remotely from Jetty Control Room.

Location of QRMH is as below:

<u>Dolphin Identity</u> <u>(from North to South)</u>	<u>No. of</u> <u>Hooks</u>	<u>Distance from Centre of</u> <u>Vapour MLA Foundation</u> <u>(in metres)</u>	<u>Setback from</u> <u>Berth Fendering</u> <u>line (in metres)</u>
MD#1	3	201.50 North	50
MD#2	3	151.50 North	50
MD#3	3	105.50 North	50
BD#1	2	70.50 North	3.5
BD#2	2	25.00 North	3.5
BD#3	2	24.00 South	3.5
BD#4	2	69.50 South	3.5
MD#4	3	104.50 South	50
MD#5	3	148.50 South	50
MD#6	3	198.50 South	50
Height (m)	(+) 6.3 m CD except (+) 9.3 m CD for MD#3 & MD#4)		

#### iv. Mooring Load Monitoring System (MLMS)

Terminal is equipped with MLMS at each mooring hook. Mooring line tensions are available on monitor screen in JCR and as a repeater on the carry-on-board laptop screen. Visual and audible alarms for overload on each line are also available. These shall be monitored to ensure that equal and allowable loads are maintained on each group of lines.

The set points for the tension alarms are:

- Low: 5 tonnes
- High: 40 tonnes

However, if appropriate, the alarm set points can be adjusted as per the mooring plans and weather conditions.

LNGC is to always ensure mooring loads of at least 10 - 20 MT evenly on all the lines during her stay alongside LNG berth.

#### v. Environment Monitoring System (EMS)

Terminal is equipped with Environment monitoring system which gives following metocean parameters on the monitor installed in jetty control room:

Wind speed, wind direction and gust, Significant wave height and time period, Temperature, Humidity, Rainfall, Air Pressure, Solar Radiation, Water level, Water Temperature, Current velocity, Visibility, Tide data, Current direction and strength etc.

All these parameters are always monitored by duty radio officer stationed in JCR whenever there is an LNGC at the berth.



## vi. Shore Access

The safe access between jetty and the LNGC is provided by tower based telescopic access ladder gangway. The gangway has a “Free-Wheel” mode which facilitates it to follow all movements of the ship automatically.

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.

LNGC is required to:

- To provide assistance on the main deck to enable proper and safe positioning and removal of shore gangway on board the vessel.
- To position a lifebuoy with at least 50 meters of lifeline on the vessel’s main deck and close to the gangway.
- To ensure proper illumination at the gangway landing area.
- To display appropriate safety notice near gangway landing area

Use of the Terminal gangway shall not preclude the Master from his responsibility to provide safe access to the Ship. Any gangway provided by the Ship should conform to the Terminal requirements with correctly rigged rails, embarkation steps, safety net and appropriately positioned lifebuoys.

Details of gangway are as follows:

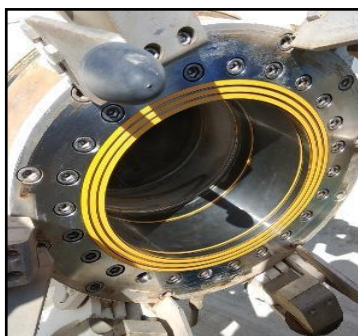
<u>Particulars</u>	<u>Details</u>
<b>Manufacturer</b>	Samgong Co. Ltd, Korea
<b>Working range</b>	CD + 8.7 metres (Minimum) CD + 24.5 metres (Maximum)
<b>Length of telescopic ladder</b>	6.5 ~ 8.9 metres (telescopic stroke 2.4 m)
<b>Distance from Vapour line centre / Spotting line</b>	24 metres southward / 25.5 m southward
<b>Landing area</b>	1.20 m x 2.50 m
<b>Working Luffing Angle</b>	-20° ~ +20°
<b>Slewing Angle</b>	-90° ~ +90°
<b>Slewing range</b>	4.00 m forward & aft
<b>Slewing speed</b>	0.27 r/min
<b>Elevator speed</b>	4.0 metres/min





## vii. Cargo Transfer Equipment – MLAs

There are 4 set of marine loading arms available on the LNG berth viz. 2 nos. liquid arms for LNG transfer, 1 no. Hybrid arm and 1 no. Vapor arm. MLAs have provisions of Quick Connect/Disconnect (QC/DC) coupling, Emergency Release System (ERS), Insulating Flange and Emergency Shutdown (ESD) system. Loading arm position is monitored by computer-based Position Monitoring System (PMS).

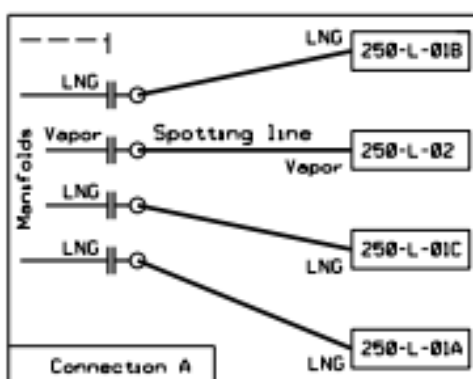


QC/DC: A hydraulically operated Quick connect/disconnect coupling (QC/DC) is installed on each arm. Emergency Release System: Each arm is equipped with a Powered Emergency Release Coupler (PERC) installed between two ball valves. The equipment allows a quick disconnection without necessitating the draining of the arms first. Details of arms is as follows:

<u>Particulars</u>	<u>Details</u>
<b>Make</b>	FMC Technologies SA
<b>Type</b>	Double Counterweighted Marine Arm (Arctic type) ANSI 150 RF
<b>Nominal Diameter</b>	6" hydraulic coupler type Chiksan III Cryo for 16" ANSI 150 flange
<b>QC/DC</b>	TechnipFMC / DBV – ANSI 150 RF
<b>Maximum flow rate for</b>	3 x 5000 m <sup>3</sup> /hr
<b>Maximum flow rate for</b>	3 x 2750 m <sup>3</sup> /hr
<b>Maximum flow rate for</b>	1 x 15000 m <sup>3</sup> /hr

<u>Arm No.</u> <u>(North to South)</u>	<u>Name</u>	<u>Dist. from Vapour Arm</u> <u>(m)</u>	<u>Pressure (Barg)</u> <u>Operating</u>	<u>Pressure (Barg)</u> <u>Design</u>	<u>Temperature (°C)</u> <u>Operating</u>	<u>Temperature (°C)</u> <u>Design</u>
250-L-01A	Arm-A	9.5	5.65 to 6.25	FV / 18.5	-160.3 to -157.9	-170 to +80
250-L-01C	Arm-C (Hybrid)	5	0.15(NG) 5.65 to 6.25 (LNG)	FV / 18.5	-80 (NG) -160.3 to -157.9 (LNG)	-170 to +80
250-L-02	Vapour	0	0.15	FV / 18.5	-80	-170 to +80
250-L-01B	Liquid "B"	4.5	5.65 to 6.25	FV / 18.5	-160.3 to -157.9	-170 to +80

Refer Annexure M for operating envelope of MLA.



Spotting line is 1.5 m north of Vapour arm centre.

## i. Ship-Shore Communication Link

The means of communication of ESD signals as well as telecommunication is umbilical type Ship-Shore Link system as detailed below:

Particulars	Connector Type	Function	Cable/Hose Length
Fibre-Optic Link	Seatechnik 6-Way Fibre-Optic Connector	ESD, Telecommunication	50 metres
Electrical Link	37 pin Male Pyle National Connector	ESD, Telecommunication	50 metres
Pneumatic Link	Male QDC Nitta Moore 1/2" Snap -Tite Coupling	ESD	50 metres

Terminal's "Hot-Line" telephone for FO/ Electrical systems is in Central Control Building (CCB) and Jetty Control Room (JCR).

Primary and secondary means of communication between the Ship and terminal will normally be either fibre-optic link or Electrical link (37 pin Male Pyle National Connector). This link will be connected by the terminal as soon as the gangway is placed and will be removed just before the gangway is removed prior ship's departure.

In the event of a failure of the primary and secondary link, all cargo operations to be suspended until at least one of the links is re-established, or until such time an alternative link as agreed is established between the Ship and the Terminal.

Additionally, a UHF walkie- talkie with configured channel to communicate with Terminal Cargo control room is handed over to Vessel during the entire cargo operation period.

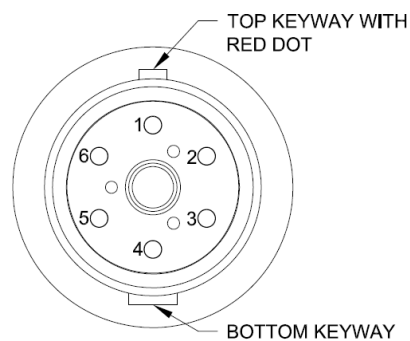
VHF channel 14 is also available for ship-shore verbal communications between ship and JCR for marine related issues like Mooring adjustment, ship positioning, requirement of pilot and tug, any emergency. Etc.

Notes:

1. To call Terminal Cargo control room please address by – LNG cargo control room
2. To call Terminal Jetty Control room please address by – LNG Jetty Control room

## a) Fibre-optic link connector configuration

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	Ship to Shore

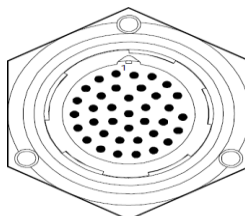


FO umbilical Connector  
Fibre Allocation

## b) Pyle-National electric link connector configuration

<u>PIN No.</u>	<u>USE</u>	<u>Remarks</u>
5 & 6	Hotline	Voltage level 18V DC (Shore has Dial-less SeaTechnik CTS-HP-3 Phone Model HP8220)
7 & 8	Tel Public	-
9 & 10	EPABX (Telephone)	Voltage level 48V DC (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

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



37 Way Electrical Receptacle  
Pin numbering (Anti-Clockwise)

## c) Pneumatic ESD

<u>Item</u>	<u>Remarks</u>
Connector type	Male QDC Nitta Moore 1/2" Snap -Tite Coupling
Air pressure (Normal/ Trip)	Normal > 3.5 bar, Trip - 3.0 bar

## d) Shore Facilities

No of Shore Tanks	02
Shore Tanks Capacity	1,80,000 m <sup>3</sup> per tank
LNG Density Range	431.1 – 477.4 kg/m <sup>3</sup>
LNG Tank heel level	2.54 m
Distance to Shore Tanks from Unloading Arms	Appx 2.16 KM
BOG Compressor(s)	03
Capacity of BOG Compressor	13.8 T/hr
Return Vapour Temperature	(-) 86 °C
Return Vapour Pressure	0.15 – 0.19 barg
Nitrogen Generation Capacity	500 Nm <sup>3</sup> /hr.

#### 4. SHIPSHORE COMPATIBILITY STUDY AND VESSEL ACCEPTANCE PROCEDURE

Every vessel nominated to transfer LNG at the Terminal shall be subjected to DLTP's standard LNG Carrier Approval procedure. All LNG Carriers, planning to call this Terminal, must be approved according to LNG Carrier approval procedure established by Terminal Operator.

Any LNG Carrier must in all respects:

- be compatible with the Terminal and approved in the DLTP's Ship-Shore Compatibility System (SSCS).
- have a valid OCIMF SIRE report no older than 6 months.
- in compliance with applicable Laws and International Standards

Terminal shall have rights of inspection and approval.

SSCS will commence once the Terminal user or LNGC Operator nominates an LNGC by filling out the "Ship nomination and request for Approval" form. Upon receipt of this form, Terminal Information Booklet (TIB), Port Information Booklet, Pre-Acceptance Questionnaire (PAQ), SIGTTO Confirmation List and a list of requisite documents/certificates for SSCS, COU etc. are shared with LNGC operator. LNGC's operator shall expeditiously send the completed PAQ (if not registered in last 24 months), SIGTTO confirmation list, copies of all documents/certificates and Mooring analysis reports (created for this Terminal) to the terminal on the designated email ID [sscs@adani-total.in](mailto:sscs@adani-total.in); SSCS will be initiated as soon as the submission of requisite documents and information are furnished by the LNGC operator/owner. For mooring, terminal requires ships to have 11 m tail ropes for all lines during non-monsoon period (1<sup>st</sup> Dec to 30<sup>th</sup> April) and 11 m tail ropes on springs & 22 m tail ropes on rest of lines during monsoon period (1<sup>st</sup> May – 30<sup>th</sup> Nov) or as depending on case to case basis as per Optimoor study.

**Refer to Annexure D for Ship nomination and request for Approval form.**

The terminal shall carry out compatibility study as per procedures and reserves the right to ask LNGC operator for any other substantiating document whatsoever necessary for smooth conduct of this study. Upon completion of SSCS, ship approval will follow in line with Terminal's LNGC Approval procedure and standard LNG industry practices. Only those vessels that successfully undergo the procedure detailed in the DLTP's LNG Carrier Approval Procedure shall be approved by the Terminal for transfer of their LNG cargo at this Terminal.

The terminal may at their sole discretion inspect the LNGC during the call at DLTP as per Terminal inspection Checklist. The LNG ship-owner/operator must address the deficiencies and observations with appropriate comments and corrective actions in order to remain an LNGC approved for this Terminal. A new inspection may be planned during her next call so as to reconfirm the status of the deficiencies observed in the LNGC.

## 5. PRE-ARRIVAL PROCEDURES AND COMMUNICATIONS

### 5.1 NOTICES OF LNG COMPOSITION

Not later than twenty-four (24) hours following the departure of each LNG Carrier from its port of loading, LNGC's Master or the agent is required to notify Terminal Owner (DLTPL) by email of the following characteristics of the LNG comprising its cargo as determined at the time of loading (**the "Quality Notice"**):

- i. Loading Date
- ii. Loaded cargo density.
- iii. the gross calorific value.
- iv. the molecular percentage of hydrocarbon components and nitrogen.
- v. Average Temperature and pressure of all cargo tanks on board LNG carrier at closing custody transfer
- vi. the hydrogen sulphide, sulphur, water, carbon dioxide, mercury, and total sulphur content; and
- vii. the presence of any foreign or objectionable materials.

LNGC's Master or the agent or the terminal user, as soon as reasonably practicable, notify of any revision (as to molecular composition and gross calorific value of the LNG when loaded to the LNG Carrier) of the information provided in the Quality Notice.

N.B: LNGC Master will ensure that LNG shall be pumped through ship's manifold strainers of 60 (sixty) mesh. If cargo carried is the first cargo after Dry Dock or First discharging of newly built Vessel, 100/200 mesh strainers are required.

### 5.2 DOCUMENT SUBMISSION

LNGC's Master or the agent or the terminal user is required to provide the copies of the following documents to Terminal DLTPL immediately or as soon as practically possible upon departure from the loading port:

- Bill of Lading.
- Cargo quantity and quality certificates.
- Cargo manifest.
- Certificate of Origin or other document stating the cargo origin.
- Material safety data sheet.
- Statement of facts / Time Sheet.

Vessel's agent shall also pass relevant required information to the DPCL Port Authorities and other concerned parties as applicable.

### 5.3 NOTICES OF ETA, REPORTINGS AND NOR FROM LNGCs

#### 5.3.1. Estimated Time of Arrival (ETA) Notices

Visiting LNGCs are required to notify DLTPL and any other parties, as applicable, with the ETA at Dhamra Pilot Boarding Station upon departure load Port, at ninety-six (96) hours prior arrival with Pre-Arrival Notification of Security (PANS), seventy-two (72) hours prior arrival, forty-eight (48) hours prior arrival, twenty-four (24) hours prior arrival. All times to be in Indian Standard Time (IST) = GMT + 5.5 hours.

LNGCs Master shall give following notices by email to [sscs@adani-total.in](mailto:sscs@adani-total.in), [kumar.anand@adani-total.in](mailto:kumar.anand@adani-total.in), [shubham.kumar@adani-total.in](mailto:shubham.kumar@adani-total.in), [pradeepkumar.bansal@adani-total.in](mailto:pradeepkumar.bansal@adani-total.in) :

**First ETA Notice** - a first notice, which shall be sent either upon the departure of the LNG vessel from the Loading Port when enroute to the Unloading Port or as early as reasonably possible and which shall set forth the time and date of departure and the estimated time of arrival at the Dhamra PBS ("ETA").

The First ETA Notice to be given shall include the following information:

- the time and date that loading was completed and the volume, expressed in cubic meters, of LNG loaded on board the LNG Vessel
- the estimated quantity of LNG (in cubic meters) expected to be unloaded at this terminal.
- the characteristics of the LNG and Notice of any operational deficiencies in the LNG Vessel that may affect its performance, together with reasons for such deficiencies.

If, thereafter, such ETA changes by equal to or greater than twenty-four (24) hours or any significant change with respect to information provided since last notice, the Master of the LNG Vessel shall give promptly notify of the corrected ETA, revised information etc. providing reasons for the change.

**Second ETA Notice** - a second notice of ETA, which shall be sent ninety-six (96) hours prior to the ETA as set forth in the First ETA Notice (as may be revised), confirming or amending such ETA. If, thereafter, such ETA changes by more than six (6) hours, the Master of the LNG Vessel shall promptly give notice of the corrected ETA, providing reasons for the change.

**Third ETA Notice** - a third notice of ETA, which shall be sent seventy-two (72) hours prior to the ETA as set forth in the Second ETA Notice (as may be revised), confirming or amending such ETA. If, thereafter, such ETA changes by more than six (6) hours, the Master of the LNG Vessel shall promptly give notice of the corrected ETA, providing reasons for the change.

**Fourth ETA Notice** - a fourth notice of ETA, which shall be sent forty-eight (48) hours prior to the ETA as set forth in the Third ETA Notice (as may be revised), confirming or amending such ETA. If, thereafter, such ETA changes by more than three (3) hours, the Master of the LNG Vessel shall give promptly notice of the corrected ETA, providing reasons for the change; also include following information with the ETA notice.

- i. Temperatures in degrees C and pressure in KPa or mbar of each cargo tank of LNGC

**Fifth ETA Notice** - a fifth notice of ETA, which shall be sent twenty-four (24) hours prior to the ETA as set forth in the Fourth ETA Notice (as may be revised), confirming or amending such ETA. If, thereafter, such ETA changes by more than one (1) hour, the Master of the LNG Vessel shall give promptly notice of the corrected ETA, providing reasons for the change; also include following information with the ETA notice.

- ii. Temperatures in degrees C and pressure in KPa or mbar of each cargo tank of LNGC

**LNGC Master shall further inform DLTPL as soon as reasonably practicable if there is any material change in the (i) temperature or (ii) pressure of each cargo tank of such LNG Carrier.**

### 5.3.2. Standard Pre-Arrival Message

The vessel's master shall on departure from loading port or previous port of call transmit the information required in the Standard Pre-Arrival Message.



**Refer to Annexure E for Standard Pre-Arrival Message format.**

### **5.3.3. Pre-Arrival Notification of Security (PANS)**

Vessels are required to furnish PANS duly completed at least ninety-six (96) hours prior arrival to Port Authority (DPCL) keeping DLTPL in copy.

### **5.3.4. Notice of Readiness (NOR)**

The LNGC Master or its agent shall tender the Notice of Readiness (NOR) to the terminal upon the LNGC's arrival at the Dhamra Port Pilot Boarding Station (PBS), once it is ready in all respects to proceed to berth and unload LNG cargo. This includes obtaining necessary clearances and fulfilling all legal, documentary, and physical requirements. The terminal shall acknowledge receipt of the NOR in accordance with the applicable terms and conditions. The NOR may be tendered to the terminal or its representative at any hour on any day of the week.

**The notices referred to above shall be sent by e-mail.**

## **5.4 LANGUAGE**

Any and all communications, whether verbal or written, shall be in English language including radio communications during manoeuvring.

## **5.5 PRE-ARRIVAL CHECKS**

The following checks and tests must be carried out successfully on board the LNG Carrier and duly recorded within three days prior to the estimated time of berthing:

- Water Spray system
- Fire pumps and Deck firefighting arrangements.
- Inert condition of annular space, primary and secondary space if applicable
- Operation of cargo system valves from remote control and their position indicators.
- Alarm function of fixed gas detection equipment
- Primary custody transfer and alarm set points
- SSL Link Test – Electric, Fibre optic, Pneumatic.
- Operation of the ESD System
- SW Ballast system tested.
- Gas meters tested.
- Cargo alarms set points checked and annunciator tested
- Air & N2 hoses and connections ready

The LNGC Master shall immediately report any defects or deficiencies concerning these checks and tests to the terminal. LNGC Master shall present evidence of satisfactory completion of the above checks to the Terminal at the pre-cargo transfer meeting.

## **5.6 ARRIVAL VESSEL CARGO CONDITION**

Masters of LNGC shall positively ensure the following:

- i. LNGC cargo tank arrival pressure shall be as low as possible but not exceeding Thirteen (13) kPag (130 mbarg)
- ii. Cargo temperature on arrival shall be in the range -158°C to -162°C

- iii. Vessel to have her lines and Liquid manifolds cooled down and drained, and ready for cargo transfer operation (Cargo deck lines not warmer than - 110°C forward and aft).
- iv. Pre-Arrival tests, inspection checklists completed.

### 5.7 PRE-BERTHING PLANNING MEETING AT LNG TERMINAL

At least 48 hrs before the scheduled arrival of any LNGC in the terminal, a pre-berthing meeting is conducted to discuss the pilotage, berthing plan, mooring/unmooring plan, cargo transfer plan, Weather, Tidal condition, other marine traffic planning in Port on Scheduled date., which is be attended by DLTP Marine Head, DPCL Marine Head , Pilots, Mooring/ Berthing Supervisor and Tug Superintendent/Masters.

### 5.8 VHF COMMUNICATION

DPCL Port Signal Station (PSS) is manned 24 hours a day and may be contacted by vessels on VHF channel 14/16. All tugboats, pilot and support crafts are available on VHF Ch. 14.

Masters of LNGCs are required to give 2 hr notice to DPCL PSS through VHF Ch-14 before arrival to pilot boarding station for arranging the Pilot.

LNG tankers Master is requested to contact DPCL PSS while entering the Dhamra Port Limits.

Once alongside and all made fast at the terminal, the LNG Carrier will be provided with an additional UHF walkie talkie to contact the terminal's (Cargo control Room) CCR during cargo operation.

### 5.9 PORT TARIFF

Port Tariff means those dues and charges levied by the Government Authorities and Port Authority for usage of the Port of Dhamra and ancillaries. It includes Port Dues, Berth hire, Pilotage & Towage, Wharfage, Indian Lighthouse Dues etc. and taxes as applicable. These are set by Port authority and various other Statutory Bodies. DPCL 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.

DLTP is responsible for ensuring settlement of such charges to DPCL.

### 5.10 CERTIFICATE OF FITNESS

Gas carriers arriving at this terminal must have a valid - International Certificate of Fitness for the Carriage of Liquefied Gases in Bulk.

### 5.11 UNDER KEEL CLEARANCE (UKC)

Vessel shall maintain an under-keel clearance of 10% of her static draft while transiting through the channel, manoeuvring inside harbour and one (01) meter throughout her stay alongside the LNG berth. The minimum depth in LNGC passage to LNG berth is CD-15.0 m. The channel and waterfront depths are monitored regularly and maintained by the dredging department of DPCL. The Pilot and Master shall consider the roll and heave in the seaward approach channel and adjust the speed accordingly.

### 5.12 TURNING CIRCLE

Turning circle (TC) of 630 m diameter is provided exclusively for LNG carriers turning. LNG vessels are turned around in this turning circle which is abreast the LNG berth.

### 5.13 PORT MOVEMENT

Utmost care and extreme caution shall be exercised by all visiting LNGCs while moving in and out from/to harbour taking into cognizance of good seamanship and prevalent industry best practices. Movement of all other traffic in the channel will remain prohibited as far as possible during LNGC arrival/departure movement in the port and keeping a minimum Moving Safety Zone of 1.5 NM as recommended by SIGTTO publications – “LNG Operations in Port Areas”.

### 5.14 ANCHORS

LNGCs shall keep both anchors in the state of readiness for immediate use while manoeuvring and/or under pilotage. During pilotage operations, and while alongside the terminal, the LNG Carrier must have the chain stoppers, locking pins and other securing devices in place on all of her anchors to prevent accidental release. The same is to be informed to the pilot.

### 5.15 CONDITIONS OF USE (COU)

As per prevalent industry practices every vessel is compulsorily required to sign Conditions of Use (COU) issued by DPCL prior availing the pilotage services and allied port services within the Port Limits.

Nothing in these conditions 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 terminal shall sign and agree to the Conditions of Use.

DPCL reserves the right at any time, to alter, change or amend any or all the provisions contained in this Conditions of Use with or without prior notice.

**Refer to Annexure F for COU.**

### 5.16 MOORING LAYOUT / CONFIGURATION

Please **refer to Annexure K** for recommended mooring pattern for certain type of ships. Optimoor mooring analysis shall form the basis of final approved mooring plan applicable for moorings from LNGC. DPCL shares the optimized comprehensive mooring plan (based on Optimoor) with incoming LNGC along with detailed mooring procedures in order to have safe and smooth mooring operation.

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**6. NAVIGATION, PILOTAGE & BERTHING AND OPERATIONAL LIMITS**

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**6.1 CHARTS & PUBLICATIONS**

Masters are to ensure that they are in possession of the latest editions of all charts (Electronic or Paper format as approved from flag state) and publications as relevant, corrected up to date and relevant documentation such as a comprehensive passage plan from berth to berth for safe navigation. Please refer to DPCL Port Information Booklet for details.

**Relevant Charts published by Indian National Hydrographic Office are:**

Chart INC 3037: Dhamra Port (scale 1:12,500)

Chart INC 3038: Approaches to Dhamra Port (scale 1:25,000)

Vessels with ECDIS and exempted to carry paper charts should have following ENCs on their ECDIS:-

1. IN63037
2. IN53038
3. IN43017 and
4. IN2351

**Other Publications:**

Indian NHO publication: Bay of Bengal Pilot INP-2

Admiralty Sailing Directions: Bay of Bengal Pilot NP-21

**6.2 ANCHORAGES**

Dangerous Cargo anchorage is designated for the use of LNG Tankers that may have to anchor prior to berthing or after Un-berthing. LNG Tankers should anchor inside the following designated anchorage area only:

Designated Anchorage Area is bound by the below coordinates:

- |                      |                    |
|----------------------|--------------------|
| a) Lat. 21° 00.811'N | Long 087° 10.000'E |
| b) Lat. 21° 02.001'N | Long 087° 13.479'E |
| c) Lat. 20° 58.005'N | Long 087° 15.150'E |
| d) Lat. 20° 58.005'N | Long 087° 10.000'E |

Minimum depth in this anchorage area is 20 metres. Seabed is soft mud.

The current in the anchorage area is very strong with strength about 3 to 4 knots. Current sets in SE direction during ebb tide and NW direction during flood tide. Vessels are advised to exercise caution. Ships should not anchor in the area other than defined above the "Designated Anchorage Area for gas carriers".

**6.3 NAVIGATION AIDS****6.3.1. Fairway Buoy**

The Fairway Buoy is located in position Latitude 20° 55.367' North and Longitude 087° 07.055' East. The light characteristics is Mo(A)8s and range is 10 Miles.

**6.3.2. Buoyed Channel**

The approach buoyed channel is about 8 NM long, 220 m – 320 m wide and is in accordance with the I.A.L.A. system Region A.

**Reference Chart is attached as Annexure A.**

#### 6.4 WIND CONDITONS

The wind speed/direction is determined by the season and by the daily temperature differences between land and sea. The region generally experiences a regular seasonal wind variation and predominantly subject to the influences of the Southwest monsoon winds lasting 'from the middle of July till about the end of September. Thereafter, the Northeast monsoon sets in from October to December.

General direction of wind is from the South to the West quarter, with seasonal variations as under:

- Feb-May: Varying from SSW/ W / SW
- June-Sep: predominantly from W /SW
- Oct-Jan: predominantly from N/NE

Norwester (*Kal Baisakhi*) which occurs during Apr- June month is a local phenomenon accompanied by strong squalls and thunderstorm. It persists for short duration (with wind speed gusting above 50 Kts at times) generally observed in the afternoon. Vessel master to brief the crew to be attentive for this phenomenon during Mooring Review meeting onboard.

#### 6.5 TIDAL RANGES

Semi diurnal tide prevails in this port and tidal predictions can be found in Indian Tide Table published by Indian Hydrographic Office.

Chart 3038 indicates the following predicted tide levels for Dhamra Harbour related to Chart Datum.

Tidal gauge is installed in the harbour.

Highest Astronomical Tide (HAT)	+4.30 m above CD
Mean High Water Springs (MHWS)	+3.40 m above CD
Mean High Water Neaps (MHWN)	+2.50 m above CD
Mean Sea Level (MSL)	+2.0 m above CD
Mean Low Water Neaps (MLWN)	+1.50 m above CD
Mean Low Water Springs (MLWS)	+0.80 m above CD
Lowest Astronomical Tide (LAT)	0.40 m below CD

#### 6.6 CURRENTS

The currents are mostly seasonal along the Dhamra coast composed of primarily tidal, and wave and wind induced components.

The maximum current is as under: -

Ebb Current: 015 X 0.6 knots off berth and in Turning Circle; 060 X 1.0 knots in the channel

Flood Current: 195 X 0.8 knot off berth and in Turning Circle; 240 X 1.3 knots in the channel

#### 6.7 WATER DENSITY

The density of the water along LNG berth and in harbour is taken as 1.005~1.020 ton/m<sup>3</sup>.

#### 6.8 BERTHING & UNBERTHING OPERATIONS

Berthing schedule shall be determined by the terminal (DLTPL) in accordance with its procedures and obligations to its users, subject to the available storage capacity and any port operational requirements of the port operator DPCL.

## 6.9 PILOTAGE

### 6.9.1. General

Pilotage is compulsory for every LNG vessel calling this terminal. LNGCs on arrival into the Port Limits should contact DPCL Port Control (known as Port Signal Station) on VHF channel 14 for relevant advice and guidance, who will advise the vessel about POB Time, Pilot boarding arrangements, Course and speed of Vessel and other information as deemed necessary.

Under normal circumstances, Pilot boards the Vessel either using pilot boat or Tugboat about 1.5 NM northeast of the fairway buoy (Latitude 20° 55.367' North and Longitude 087° 07.055' East). POB time is confirmed by the Port on receipt of 24 hrs notice.

Tugs will be deployed for assistance in manoeuvring at the sole discretion of the Pilot.

LNG Carriers at the terminal shall be moored to port or starboard side alongside the berth depending on the state of tide, wind and Vessel's compatibility Study with the Terminal. This is normally instructed to the vessel for preparation prior 48-24 Hours of arrival.

### 6.9.2. Master Pilot Information Exchange

Upon boarding, Pilot will carry out Master-Pilot Information Exchange with a view to ensure safest manoeuvre and berthing to the designated berth. Following shall be made available by the LNGC master to the Pilot:

- i. Completed IMO standard Pilot Information Card
- ii. Draft fore and aft
- iii. Type of propulsion, steering gear, and astern power limitations; any malfunction or abnormal behaviour.
- iv. Gyro compass error
- v. Any other pertinent navigational information including any deficiency of navigational equipment.

After Master Pilot Information Exchange, the Pilot shall discuss with LNGC Master and explain the plan for channel transit, approach, turning around in the turning basin and mooring /unmooring plan with the master. The Master and Pilot shall agree on such plan and sign it as a token of having understood and agreed to their fullest satisfaction. The pilot will get the port's Declaration of Security (DOS) to be signed by the LNGC Master as & when required.

In case the pilot finds any defect in navigational equipment and/or vessel's steering/propulsion machineries, he is fully authorised to abort pilotage and issue Vessel Deficiency Note (VDN) prior disembarkation. Under such circumstances LNGC shall proceed to anchorage and rectify the defects at the earliest. Once defects are rectified LNGC shall tender the NOR afresh and inform the terminal and port. Such rectification of defects will be verified by the boarding Pilot and subsequently by DLTP representative.

### 6.9.3. Pilot Boarding Arrangements

All LNGCs shall provide adequately safe Pilot boarding arrangement confirming to the requirements of SOLAS Ch. 5 / Regulation 23 and any amendments. In case the boarding arrangement is found to be inadequate and/or unsafe pilot is fully entitled to abort boarding and LNGC shall have to proceed to anchorage for rectification of the defects observed.

**Refer to DPCL Port Information Booklet for Pilot boarding and disembarkation arrangement.**

## 6.10 ENVIRONMENTAL OPERATIONAL LIMITS

### 6.10.1. For Berthing of LNGCs

#### Limiting Environmental condition

<b>Wind speed</b>	Up to 25 Knots at PBS
<b>Significant wave height (Hs)</b>	Up to 0.6 m off LNG berth or 2.0 m at PBS
<b>Time Period of wave (Tp)</b>	≤6s
<b>Surface current</b>	Up to 0.65 m/s or 1.3 Knot
<b>Visibility</b>	More than 1.0 nautical mile

### 6.10.2 Operational limits for Vessels alongside berth

<u>Sustained Wind Speed at Berth (Knots – average over 30 minute period)</u>	<u>Action</u>
Greater than 25	Suspend Berthing
Greater than 30 or significant movement of Vessel	Stop Cargo
Greater than 32	Disconnect MLAs
Greater than 35	Consider unberthing & departure

N.B. The operational status will be maintained on the basis of observed parameters in non-cyclonic weather whereas during cyclonic weather it will be maintained on the basis of forecast data. Wind speed limits are based on sustained average wind speed of a minimum 30 minutes' duration at 10 m height above Surface (not gust) measured locally.

The above operational limits and information from below sources are to be taken into consideration prior taking a substantial action:-

- Forecasted weather report
- Prevailing weather as measured by EMS (Environment Monitoring System)
- Sustained wind speed and/or other parameters for thirty (30) minutes duration
- Variation in MLMS load and condition of mooring system
- Position and movement of vessel relative to the berth spot line
- Time to de-ice / drain / purge and disconnect arms
- Time and Range of Tide
- Any other parameter as deemed relevant by the concerned parties

In order to ensure safety of his vessel, cargo, crew and protection of environment, Master being fully responsible and accountable may take appropriate decision after consultation with Terminal and Port Control relating to suspension of operations and movement of LNGC as deemed necessary and adequate. Any action whatsoever deemed substantial and adequate shall be taken in ample time and well before situation worsens and make course of action difficult to execute. While complying with operational limits as mentioned above, the master of LNGC is required to communicate with the terminal in determining if the operation is safe to conduct.



**6.11 ACTION AND PROCEDURES IN CASE OF MINOR SHIFT OF VESSEL'S POSITION ALONGSIDE**

In case of LNGC moving out of position by a considerable distance or to a point which activates the alarms on the PMS, terminal may suspend transfer operation and try to reposition the LNGC without disconnection using mooring lines.

If it not possible to safely continue operations, then terminal will ensure to stop operations and cargo arms drained, purged, and disconnected prior to re-positioning the LNGC using tugs. While correcting the vessel's shift of position, LNGC shall have its main engine ready for immediate use and Port shall send pilot and adequate tugs to attend. Once the situation is under control both vessel and terminal shall do joint risk assessments that shows it is safe to continue operations before resuming transfer. The following describes the maximum movement allowable before operations should be suspended and the vessels repositioned.

- LNGC movement relative to berth spot line: +/- 1.0 m maximum

**6.12 EMERGENCY DEPARTURE OF LNGC**

The terminal with or without the consent of the LNGC master, will take the decision in regard to emergency departure of the LNGC in the sole interest of safety of the vessel and terminal. Terminal will inform the Port Authority (DPCL) for swift arrangement of pilot services and tugs.

The terminal authority may order the LNGC to cease operations, disconnect, and depart the port in case of an emergency in the terminal/port. Such decision shall be taken and communicated in a manner that gives the LNGC ample time to prepare safe departure and channel transit. The LNGC shall have first priority for pilots and tug assistance in case of emergency departure.

The Master of LNGC is solely responsible for his vessel's stability, safety of vessel, cargo & crew and sea worthiness while seeking emergency departure. Sloshing of LNG must be taken into consideration prior any decision of emergency departure is taken. Time to prepare for departure with regard to sloshing limitations shall not exceed 4 hours and the same shall be taken into consideration. If an emergency requires an immediate departure of the LNGC, the master is the sole responsible person for his vessel and may determine proper action, including departure without being within sloshing limitations.

As guidance only, LNG Carrier's Master and owners are directed to the "January 2012 Lloyd's Register Guidance on the Operation of Membrane LNG Ship to Reduce the Risk of Damage due to Sloshing or Equivalent". The LNG Vessel should, as a minimum, have developed a safe condition departure plan in the event the LNG Carrier is required to depart the terminal before cargo completion. Such a departure plan shall be required as part of the LNG Carrier pre-approval process at the terminal.

Possible mitigation measures and considerations for inclusion in the plan may include:

- i. Development of passage plans that consider wave directions, wave periods, and fill levels of cargo tanks,
- ii. Constraints imposed by sea room to reduce exposure to beam sea conditions,
- iii. Anchoring plans, and
- iv. Internal transfer of cargo between tanks.

**6.13 PRECAUTIONS FOR ENVIRONMENTAL CONDITIONS ALONGSIDE**

The master shall ensure that the weather forecast is within the documented operational limitations for safe cargo operation while staying secured alongside berth and shall also ensure to regularly monitor the weather conditions whilst transfer operation is in progress.

The weather forecast will be provided by the port to the LNGC. As a standard practice the weather forecast for look-ahead period, covering the entire duration of LNGC's stay, should be considered, in order to satisfy themselves that conditions will remain favourable for safe cargo operations without the need for interruption or un-berthing of the LNG Carrier.

The vessels shall monitor the actual weather parameters on a continuous basis. Master may refer to weather forecast reports made available to them by their management companies as well. Any decision to cease operations and depart shall be based upon the official weather forecast (shared by the port) during cyclonic weather and be based upon the observed environmental parameters during non-cyclonic weather.

Lightning hazards may be associated with several severe weather conditions. During periods when lightning/ thunderstorms poses a threat, personnel are expected to use prudent judgment, proceed indoors, and withdraw from exposed locations. In case of electrical storm in close vicinity of LNG berth, LNGC Master shall discuss with the terminal, observe safety rules, and may suspend cargo operations as deemed necessary to ensure safety of vessel and terminal. During the suspended period, the loading arms will be maintained cold by use of a small spray/stripping pump.

As guidance for all practical reasons, electrical storm shall be considered to be in close vicinity if lightening takes place within a distance of **500** metres from the vessels alongside. Careful evaluation of the circumstances and potential for release of gas should be considered when determining whether to shut down or continue cargo transfer operations with electrical storm activity in the vicinity.

The LNGC Master shall ensure continuous and strict deck watch on board and shall have due regard to any change in environmental condition such as tide, wind, swell etc. and its precarious effect on moorings and overall transfer operations. Tending of mooring lines shall be carried out on priority by respective ship staff in particular whenever any significant changes in environment conditions occur.

LNGC master is required to positively inform the terminal of any potential risk, hazardous situation developed, near miss and/or incident occurred. LNGC Master shall continue to communicate closely with the terminal and operations shall remain suspended until it is jointly established that no unsafe act, conditions exist on LNGC and both terminal and LNGC have made risk assessments concluding with that it is safe to resume cargo operations.

In case of ESD activation, once an emergency is over and the situation is secured, the initiator of the ESD shall notify all stations accordingly and operations shall be resumed only after, both terminal and LNGC have made risk assessments concluding with that it is safe to resume cargo operations. Details of the occurrence shall be entered on the 'Emergency Shutdown Report' form, and the cause is to be investigated.

## 7. INWARD / OUTWARD CLEARANCE AND PROHIBITION RULES

### 7.1 CUSTOMS, IMMIGRATION AND QUARANTINE

LNGC shall be subjected to verification and clearance process by Government authorities such as Customs and Immigration Officials. Normally this is carried out alongside upon berthing, but same may be carried out on anchorage on vessel's arrival at the discretion of government authorities. Arriving LNG vessels shall furnish the documentation to their nominated agents as per below indicative table:

Sr. No.	Document name	No. of copies
1	Cargo manifest	1
2	Ship particulars	1
3	Crew list	1
4	Passenger list	1
5	Animal list	1
6	Vessel stores list	1
7	Vessel property list	1
8	Bonded store list	1
9	Crew personal effect declaration	1
10	Crew currency declaration	1
11	Currency list (ship)	1
12	Arms & ammunition list	1
13	Nil & narcotics list	1
14	Last 10 ports of call list	1
15	Last port clearance	Original + 2 copies
16	Load port cargo survey report	1
17	Protest letter, if any, pertaining to cargo	1

Additionally, the copies of the following certificates are also required:

- Certificate of Ships Registry
- International Load Line Certificate
- International Oil Pollution Prevention Certificate
- International Tonnage Certificate
- Cargo Ship Safety Equipment Certificate
- Cargo Ship Safety Radio Certificate
- Cargo Ship Safety Construction Certificate
- ISPS Certificate
- P&I Insurance Policy / P&I Certificate of Entry
- Wreck Removal Certificate
- Document of Compliance (ISM Code)
- International Ship Security Certificate
- Safety Management Certificate (ISM Code)

- Classification Certificate
- Ship Sanitation Certificate
- Safe Manning Certificate
- Pre -Stowage Plan
- Last Port clearance
- International Air Pollution Prevention certificate (IAPP)
- Civil Liability Convention (CLC) 1992 Certificate
- Civil Liability for Bunker Oil Pollution Damage Convention

As per latest directive from Director General of Shipping (India), all vessels are registered on each call by their agents on Maritime Single Window System (Sagar-Setu) and generate a Vessel Call Number (VCN) without which the berthing and Port clearance of the vessel may be suspended by the authorities. This is done in line with IMO's guidelines to adopt a digital reporting platform to simplify exchange of mandatory information across various Govt. agencies and the industry.

**N.B. Above requirements need to be confirmed from Vessel's Agent prior arrival.**

### 7.1.1 Vessel Boarding – Statutory Authorities and Other Personnel

Dhamra LNG Terminal is located within jurisdiction of Indian legal system. Masters are advised to consult their appointed Agent for detailed information regarding applicable Indian laws related to immigration, customs, and quarantine. LNGC shall stay guided by the rules & regulation of Indian Customs department, Immigration department, and Port Health Office.

### 7.1.2 Immigration

There is an immigration check post inside DPCL port. Vessel's agent will coordinate with the competent authority for immigration matters. Crew change and Shore leave for crew members of the LNGCs is permitted. LNGC may be boarded by Immigration officials for inward clearance and the same will be arranged and attended by vessel's agent.

### 7.1.3 Customs

Visiting LNGC's appointed agent shall arrange for inward port entry, filing of IGM etc. LNGC shall be boarded by Customs officials for inward clearance of vessel and LNG cargo on board; the same will be arranged and attended to by vessel's agent. The agent shall co-ordinate with DPCL, DLTP, arriving LNGC and Customs Office, Dhamra for inward clearance of LNG carrier.

### 7.1.4 Health/Quarantine

Dhamra Port comes under the jurisdiction of Port Health Officer (PHO), Kolkata. These matters should be dealt with by the arriving LNGCs via their shipping agent. Quarantine flag shall continue to be hosted until the free pratique is granted by the relevant authorities. The Government Health Authorities will grant free pratique. Port Health Officer (PHO) may board the vessel upon berthing and carry out quarantine inspection on the vessel. The vessel's agent will be responsible for making the required arrangements.

One copy of the following documents is required:

- i. Maritime declaration of Health
- ii. Vaccination list including COVID 19
- iii. Ship Sanitation Control/Exemption Certificate (SSCES)
- iv. Crew list with joining date and place

- v. Last 10 ports of call
- vi. Travel history of crew member joined within 14 days of arrival at Dhamra
- vii. Daily Health declaration Temperature Log-Sick Person report

**IMPORTANT: No person shall be allowed to board the vessel before the vessel is cleared by Immigration/Customs/PHO and the LNGC agent confirms the same.**

### 7.2 PORT CLEARANCE

Every vessel required to leave this port/terminal shall obtain a Port Clearance (PC) issued by the Dhamra Customs office. Prior to seeking Port Clearance from Customs department, vessel's agent shall obtain "No Dues Certificate" from DPCL.

A Port Clearance for outward sailing of any vessel may be withheld by DPCL in case of non-payment of port dues or statutory dues and/or for any violation of the provisions of the Laws, or for any legal cause or restraint duly ordered by any court in India, or any unforeseen situations necessitating vessels continued stay within the Port.

### 7.3 NARCOTIC, DRUGS AND CONTRABAND

The use or possession of narcotic drugs anywhere within India is strictly forbidden with severe penalties for any transgressor. Masters are reminded of their responsibility for the security of prescribed narcotic drugs (in medical chest) carried on board vessels.

Dealing in contraband is strictly forbidden and Masters are advised that heavy penalties are imposed on crew member and/or the vessel's owner, if found involved in movement of 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.

### 7.4 ALCOHOL

Masters are to ensure that the bonded store inventory remains same as advance declaration furnished to the agent such that boarding Customs official find the bonded stock in order and seal it. This seal shall neither be tempered nor broken before vessel leaves Port limits. Violations shall attract heavy penalties from the appropriate authorities.

DLTPL and DPCL have zero tolerance on alcohol within their premises. Any ship visitor/on signer crew may be subject to a spot breath alcohol analyser test if suspected. LNGC master shall ensure strict implementation of company's Drug and Alcohol Policy on board and observance of terminal's Drug and Alcohol Policy too.

### 7.5 FIREARMS

All firearms, including ammunition, shall be declared in advance through their agents to the authorities who shall specify their security arrangements required. Unless the agent secures necessary permission from relevant authorities, vessel's entry inside Port limit shall not be allowed. Vessels carrying explosives shall not be allowed to enter the terminal.

### 7.6 PHOTOGRAPHY

Photography and videography of DLTPL and DPCL facilities are strictly prohibited. The use of any kind of cameras, mobile phone cameras including video cameras, within the LNG berth as well as Port is strictly forbidden. Appropriate action will be initiated against the person found to infringe this regulation and photography device shall be confiscated.

## **8. BERTHING, CARGO TRANSFER OPERATION & VESSEL STAY AT BERTH**

### **8.1 MASTER'S RESPONSIBILITY**

The vessel's Master is responsible at all times for the safety of operations, vessel & her crew, and protection of environment & property. Once NOR is tendered, LNGCs shall be expected to be in the state of readiness to safely pick up pilot, come alongside the DLTPL LNG berth and moor, carryout cargo transfer operation and depart to the satisfaction of port and the terminal in compliance with relevant applicable rules and regulations and LNG industry practices.

LNGC Master is expected to comply with relevant International Rules and Regulations and action, procedures, and requirement of Safety Management System on board.

The terminal operational procedures do not contravene with International Safety Rules such as SOLAS or other maritime regulations such as those of the classification societies. In case of any conflict the latter shall apply.

The responsibility of own vessel Safety, crew and cargo operations remains with LNGC Master at all times. Terminal will provide all necessary supports wherever required.

### **8.2 TURNING AROUND AND APPROACH FOR MOORING ALONGSIDE LNG BERTH**

DPCL pilot shall advise the vessel approach to the berth and mooring plan to the Master. LNGCs shall take pilot at the pilot boarding station and will be manoeuvred to the inner harbour. LNGCs shall be turned around in the LNGC turning basin abreast of LNG berth by taking port or starboard turn depending on the state of tide and brought parallel to the LNG berth.

Once LNGC is parallel to the berth, she will be brought in towards the berth by making judicious and optimum use of tugs as well as her own means of propulsion. Such parallel approach shall be slow and steady, and the approach speed and angle of approach shall not exceed 0.10 metres/sec and 10 degrees to the berthing line at the time of touching the fixed fenders of berth. LNG Master and the pilot shall make sure smooth and safe landing of LNGC onto the fenders meeting the criteria mentioned above. Once vessel is on fender, Vessel forward and aft positioning with respect to shore spot line shall be done slowly and preferably using spring lines.

### **8.3 COOPERATION BETWEEN TERMINAL AND LNGC**

The LNGC Master shall ensure that the concerned staff vested with responsibility of conducting or overseeing the cargo operations and related duties are adequately qualified, competent, and experienced, including the ability to communicate in English. It must be ensured by LNGC Master that sufficient personnel remain on board at all times to carry out safe and efficient operations.

LNGC Master shall also ensure that all equipment aboard the LNGC shall be in good working order as required for carrying out safe & efficient cargo transfer operations. In case any deficiency is observed before/during/after berthing operation, LNGC Master shall at once inform to the DLTPL without any delay. Effective co-ordination and communication with DLTPL shall be maintained by the LNGC Master and crew.

The Master of LNGC shall follow the procedures of terminal for cargo transfer operations.



## 8.4 LNGC MOORING TO BERTH

The LNG Carrier will be moored as per a pre-approved mooring scheme agreed by the Terminal and the LNG Carrier's Operator at the SSCS process stage or Pre-Acceptance meeting (Pre-Acceptance meeting is held if deemed necessary and on demand). Optimoor mooring analysis shall be furnished by the LNGC operator to the Terminal during SSCS and the same shall be reviewed by the DLTPPL Terminal and the DPCL Port.

The mooring scheme shall be sent to the LNGC Master by the terminal for sequencing of mooring lines for final approval. Mooring operation of LNGC to berth shall be carried out complying with approved mooring plan.

Approved mooring plan shall be adhered to, except if the Pilot and LNGC Master agree on using more number of lines than specified in the mooring plan as per optimoor study. All LNGCs are required to follow port's procedures during mooring/un-mooring operations.

LNGC Master shall be guided by the relevant OCIMF publications like Effective Mooring, Mooring Equipment Guidelines etc. Below is the flow chart showing ship-shore interface activities from mooring till departure: -



## 8.5 MOORING LINE LOAD MONITORING

LNGC Master shall ensure to keep all lines adequately tight and secured, taking into consideration the prevailing conditions, requirements as per Mooring Study and MEG guidelines. Auto tensioning is not allowed under any circumstances. The LNGC Master shall ensure that the moorings are adjusted correctly from all fast until departure.

The load monitoring data of the LNGC's mooring lines is made available to LNGC through Ship-Shore Link (SSL). In case the line loads are not available on ship's monitor through SSL then LNGC is provided with Carry On Board (COB) Laptop or Handheld pager device for monitoring the load on mooring lines. A tension log shall be kept with data given at least once every 4 hours. If the wind, waves, or swell increases the tension logging shall be done every hour, half our or quarter hour as required by the terminal. In case of any doubt or need LNGC may directly contact JCR Radio Officer on VHF Ch.14 and obtain mooring line loads, environmental parameters.

LNGC crew and responsible officer must periodically check the condition of moorings and maintain uniform line tension of minimum 10 tons on each line.

#### **8.6 STANDBY TUG WHILE ALONGSIDE BERTH**

During the entire stay of any LNG Carrier alongside the berth, Stand-by tug shall remain available at 15 minutes notice for any assistance to LNG carrier. Vessel shall contact on VHF Ch- 14 to LNG Jetty control room to ask for tug assistance.

#### **8.7 TENDING TO MOORINGS**

The LNG Master shall at all times ensure that the moorings are tended to under careful supervision so as to keep LNGC resting on the fenders of LNG berth.

The Terminal shall ensure that the LNGC has updated weather reports available well in advance so that substantial and appropriate action in regard to safe berthing, operations and departure can be taken in ample time by the LNGC Master.

Extreme caution and particular alertness shall be exercised by the LNGC Master at the onset of deterioration of weather.

#### **8.8 DECK WATCH**

LNGC Master shall ensure the cargo control room shall be manned at all times by a responsible and certified officer and adequate crew members remain on deck so as to ensure the utmost safety, observance of laid down/agreed procedures in achieving efficient and smooth LNG transfer operations. A manifold area watches by a crew member from the Trunk deck / Catwalk or by any other means such as CCTV etc. shall be maintained at all times. Gangway watch to be maintained at all times.

#### **8.9 SAFE ACCESS TO LNGC FOR SHORE PERSONNEL**

The tower based telescopic access gangway will be provided as safe means of access between the LNGC and the terminal for agents, authorities, crew etc. In case the gangway is not operational then outboard accommodation ladder on the seaside of the LNGC will be the means of access to the LNGC.

#### **8.10 CLEARANCE/PERMISSION TO BOARD LNGC**

Visiting LNGC's appointed agent shall keep DLTP and DPCL posted on clearances from statutory authorities such as Customs, Immigration and PHO. Upon LNGC is declared "all fast" the agent will accompany and arrange boarding of officials from Immigration, Customs and Port Heath departments on LNGC and obtain clearance from them for allowing other personnel to board the LNGC. Until such permission is granted to LNGC, LNGC Master shall not allow anybody to come on

board under any circumstances and conditions. In case of any doubt LNGC Master may contact DLTPL terminal authority.

## 8.11 TERMINAL'S BOARDING OFFICER (BO)

Terminal's nominated officer will act as the boarding officer (may also be called Loading Master), who shall board the vessel upon berthing once permission granted by the relevant authorities and confirmed by the agent. BO shall take safety rounds of the LNGC along with LNGC's responsible officer so as to carry out checks as per standard Ship to Shore Safety Checklist (SSSCL).

He will take part in PCTC (Pre Cargo-Transfer Conference), witness the ship-shore cargo transfer information exchange and opening/closing CTMS. He shall be working closely with the LNGC's Cargo Control room and Terminal's control room to ensure safe and smooth cargo transfer and complete associated documentation.

## 8.12 SAFETY ROUND ON LNGC

Safety round on LNGC shall be conducted by the terminal's boarding officer/Marine Officer and any responsible officer from LNGC deputed by LNGC's cargo officer to comply with standard Ship to Shore Safety Checklist (SSSCL).

Boarding Officer will discuss any observations from safety rounds with LNGC's Master during Pre Cargo-Transfer Conference (PCTC) and if required, appropriate additional corrective/preventive measures shall be requested.

Only after satisfying themselves that all corrective/preventive measures have been taken and it is safe to proceed, cargo operation to be commenced

## 8.13 PRE CARGO-TRANSFER CONFERENCE (PCTC)

Prior to opening Custody Transfer Measurement, Boarding officer, Master and other officers of the LNGC, representatives of Terminal User, buyer & seller as applicable and independent cargo surveyor shall hold a joint meeting called Pre Cargo Transfer Conference (PCTC) on board the LNGC to discuss and agree upon safe cargo operation procedures in compliance with the Terminal's Safety Regulations.

Purpose of the PCTC is to ensure the following:

- To ensure that all aspects of the cargo transfer and associated activities are clearly understood and documented using the Terminal's PCTC agenda.
- Persons in charge of cargo operations aboard LNGC understand and agree as regards how the LNG transfer operation will proceed.
- Terminal ensures safe cargo transfer practices are followed so as not to endanger the terminal and the LNGC.

PCTC ATTENDEES		
<u>Required Attendee</u>	<u>Representing</u>	<u>Meeting Role</u>
Terminal Marine Head/Lead or designated person	Terminal	Overall Terminal Coordinator
Shift Superintendent	Terminal	Cargo transfer agreement
Boarding Officer	Terminal	Facilitate co-ordination for ship-shore interface activities; SSSCL

LNGC Master, Chief officer, Cargo engineer	LNGC	Facilitate co-ordination for their ship side activities
Independent cargo surveyor	Seller and buyer	Represent seller and buyer
Terminal User representative (optional)	Terminal User	Represent Terminal User
Seller representative (optional)	Seller	Represent seller
Buyer representative (optional)	Buyer	Represent buyer

Agenda for PCTC shall be as per Terminal's procedures and Terminal Representative (the Boarding Officer) shall put forward terminal's requirements and limitations during the course of PCTC whenever required.

The agenda for this meeting shall include not necessarily be limited to the following: -

- Confirmation of Pre-Arrival safety checks
- Status of cargo tanks on arrival (temperature and pressure)
- Custody transfer (CTMS) requirements and vessel's status
- Connection and disconnection of arms
- Sequence of ESD tests
- Arms Cool-down procedure and Vapour handling
- Unloading procedures, schedule, Ramp up and Ramp down
- LNG Carrier cargo heel requirements and stripping requirements
- Partial fill requirements and duration cargo tanks will be in this condition
- Ballasting and draft requirements
- Bulk cargo transfer procedure Ramp down
- Drain, purging and disconnecting
- Anticipated weather and sea conditions.
- Communications with DLTPL. Main and back-up communication means
- Communications between LNGC and Stand-by tug as applicable
- Emergency Procedures including unmooring operations and evacuation plans
- Emergency Shutdown
- Maritime Security arrangements
- MSDS
- Requirements of nitrogen during purging of unloading arms.
- Mooring line load monitoring
- Weather forecast update and weather monitoring
- Communications with Terminal and Port
- Work permit requirements
- Tugs
- No smoking areas
- Completion of SSSCL and regular repetitive checks

Terminal's BO and LNGC Chief Officer shall mutually complete standard Ship to Shore Safety Checklist during the meeting, after taking due care of the observations during the safety round. BO and LNGC's Chief Officer shall discuss and review the unloading plan of LNGC, make changes if required and agree to final version.

Permission to proceed with connections shall be granted by mutual agreement between the BO and LNGC Master and shall be withheld till items flagged by either party are addressed satisfactorily.

Terminal shall as a minimum get following docs jointly filled in, signed, and stamped as proof of agreements during PCTC:

- i. Safety Letter
- ii. Ship to Shore Safety Checklist
- iii. Cargo transfer Agreement
- iv. Any document/agreement/checklist required by LNGC's Safety Management System which requires terminal's consent
- v. Any commercial documents such as Notice of Readiness (NOR) which are required as per the guiding MSPA or similar agreement.
- vi. Any other agreed deviation/permission

### 8.14 NOR (Notice of Readiness) Acceptance by the Terminal:

Terminal shall accept the NOR notice tendered by the vessel once she is all fast alongside the berth and ready to commence LNG transfer operation in all respects which is to be confirmed during Safety round. NOR acceptance time will be taken as completion time of the Safety round if all found satisfactory. If any deficiency is noted during the Safety round which can affect safety of LNG operations, then same to be immediately attended and closed by the vessel. In such case, NOR Acceptance will be taken as the closure time of the deficiencies.

DLTPL terminal and the LNGC Master shall take all steps necessary to complete the operation safely within the "Allowed Laytime".

Time lost as a result of any of the following shall not be counted in the Laytime:

- a. Reasons attributable to the fault of the LNGC or her Master, crew, owner, or operator.
- b. Force Majeure.
- c. Adverse Weather Conditions.
- d. Time spent in arresting gas/liquid leakages on ship.
- e. Time spent in doing ship's line cooldown if not done beforehand.
- f. Time spent for the tank stripping operations (Heel out) if required by the Master of LNGC; and
- g. Time during which normal operation on DLTPL terminal is prohibited by any law, regulation or decree.

If due to reasons solely attributable to the fault of vessel, the laytime is exceeded beyond the allowed laytime then terminal will issue letter of protest stating the time delays with reasons and may charge the ship owner/charterers/agents for the commercial losses in the form of extra Berth hire charge, Manpower charges etc. caused due to the delays.

### 8.15 LNG TRANSFER FACILITY

- The jetty is fitted with four 20" FMC make "DCMA" loading arms with 16" QCDC connecting flange.
- The gaskets are provided by terminal.
- 60 mesh strainers to be supplied by LNGC for each liquid arm. If it is 1<sup>st</sup>/2<sup>nd</sup>/3<sup>rd</sup> discharging after Drydock or a new built vessel's 1<sup>st</sup>/2<sup>nd</sup>/3<sup>rd</sup> discharging, then 200 mesh strainers to be provided by the vessel.
- After confirming the insides and outsides of the manifolds are free from foreign debris and appropriate filter (mesh 60) from LNGC side are put in place, Terminal's representative manoeuvres the arms into position near to the appropriate LNGC's manifold.

- After the blank flange is completely removed, the arms are then connected manually by the Terminal.
- The Terminal Operator will advise the LNGC master that arms are connected and will pressure test the connection with Nitrogen up to 5 ~ 6 bars. When connections have been satisfactorily tested, the unloading arms will depressurize to the atmosphere.
- The water curtain shall remain running continuously until completion of cargo operations & after the final arm has been confirmed gas free and disconnected.
- Unloading Arm connections to the LNG Carrier will be leak tested with the Terminal nitrogen supply prior to the commencement of cargo loading operations. The pressure used for this leak test will be agreed upon between the LNG Carrier and Terminal Representative and will be dependent upon the maximum expected operating pressure for the planned operation. The maximum allowed pressure in the loading arm is 6.25 barg for liquid arms and 0.15 barg for vapour arm. The maximum allowed pressure for the transfer operation will be detailed in the "Cargo Transfer Agreement" form duly signed by the authorized representative of the Master and DLTPL.

**Refer Annexure J for Cargo Transfer Agreement format.**

## 8.16 SEQUENCE OF UNLOADING OPERATION

Table below defines the whole operating scheme procedure during the unloading of LNG into the tank. It consists of the operating activity beginning with the arrival of the Ship, mooring, unloading and final departure of the Ship.

Table: Summary of unloading operation procedure

Step	Activity	Responsibility
1	LNG ship mooring	DPCL
2	Connection of gangway to Ship side	DPCL
3	Connection of communication cable and test	DLTPL and LNGC
4	Connection of pneumatic hose (for ESD transmission)	DLTPL and LNGC
5	Meeting before unloading operation between Ship and terminal	LNGC and DLTPL Representative
6	Initial gauging of cargo	LNGC, DLTPL Representative, Cargo surveyor
7	Stop LNG recirculation throughout the Unloading Lines	DLTPL
8	Connection of LNG Unloading Arms and vapor return arm to Ship's manifolds	DLTPL
9	Leak tests and N2 purge of unloading arms	DLTPL and LNGC
10	ESD-1 Test (for Unloading shut down)	DLTPL and LNGC
11	Release of N2 Pressure on lines at ship manifold	DLTPL and LNGC
12	LNG Arms cooling down	DLTPL and LNGC
13	Line setting for unloading operation from jetty to LNG Storage Tanks	DLTPL
14	Start the unloading operation	LNGC and DLTPL
15	Confirmation all in order for commencing ramp-up	DLTPL and LNGC
16	Supply NG return gas to LNG Ship as necessary	DLTPL
17	1 hr notice followed by 30 & 10 mins prior ramping down	LNGC



18	Stop Ship cargo pumps	DLTPL and LNGC
19	Stop the NG return gas loading	DLTPL
20	Isolation of Unloading Line	DLTPL
21	LNG draining out from LNG Arms	DLTPL and LNGC
22	Purge for Unloading Arms with nitrogen	DLTPL and LNGC
23	Gauging of LNG cargo remaining on board	LNGC, DLTPL Rep, Cargo surveyor
24	Disconnection of Unloading Arms	DLTPL
25	Start LNG recirculation	DLTPL
26	Disconnection of pneumatic hose	LNGC and DLTPL
27	Disconnection of communication cable	LNGC and DLTPL
28	Disconnection of gangway	DPCL
29	LNG Ship unmooring	DPCL
30	Departure of LNG Ship	LNGC
31	Transfer LNG from Jetty Drain K.O. Drum to LNG Storage Tank through 36" LNG unloading header.	DLTPL

## 8.17 COMMUNICATION LINK AND ESD TESTS

The terminal shall pass both Fibre Optic as well as Electric cable to LNGC fitted in the umbilical between the terminal and LNGC. ESD tests to be completed as per the requirements of the terminal. Both systems (FO and Electric) will be tested one by one for confirming the intended operation, then one of these will be declared to be Primary and the other one as Secondary means for ship-shore communication and ESD. Pneumatic SSL connection is also available for use and will be passed on to the LNGC if required. The cause and effect of shutting down cargo transfer in an emergency shall be discussed and confirmed by the terminal and LNGC prior to commencement of the cargo transfer. Vapour management and the actions surrounding recovery from an ESD shall also be confirmed.

Prior to LNGC arrival, the ESD system shall be thoroughly tested by both terminal and vessel as required by the IGC code. All methods of activation should be tested and the timing of the ESD valve closures shall be noted. The LNGC should set its valves to close within 28 seconds for cargo transfer operation.

Prior to commencement of the cargo transfer (Arms cool down), the linked ESD system shall be tested by the terminal and LNGC in accordance with the IGC code. The ESD shall be tested once loading arms are connected and purged. Warm ESD test will be performed first from the LNGC and then from the terminal side. It is important that the ESD valves are not operated before purging has been completed since the arms may contain oxygen and moisture.

The procedure for testing the linked ESD system shall be addressed in the Compatibility Study and confirmed at the pre-cargo transfer conference. LNGC will agree to the sequence and number of tests to be conducted.

- Two warm emergency shutdown tests are performed, one from LNGC's control room and one from terminal side.
- To limit pressure surges, particularly in the hard arms (which may be the most vulnerable components in the pipeline system); checks are made to ensure that the LNGC's emergency shutdown valves close before the jetty ESD valves.
- ESD activation shall also ensure stoppage of the LNGC's cargo pumps.



- d) COLD ESD test shall be carried out after initial cool down of arms. Cold ESD test will be performed first from the LNGC and then may be from the terminal side if necessary.
- e) Unloading emergency shutdown is a two-stage emergency shutdown system, linked to the LNGC by a hard-wired connection and an Electrical/Fiber optic link as per SIGTTO protocol.
- g) ESD-1 Can be activated by Ship & Terminal both, whereas ESD-2 will be activated from Terminal side only.

### 8.18 COMMUNICATIONS DURING STAY ALONGSIDE

Communications between LNGC and Terminal Cargo Control Room shall be established before commencement of cargo transfer operations. Communications method shall be included in the ship compatibility study and shall be confirmed during the PCTC.

The terminal shall provide the communication links to the LNGC.

Primary Communication: Hotline/PABX Phone

Secondary Communication: UHF Radio Set provided by the terminal to Ship CCR

### 8.19 COMMUNICATIONS FAILURE

In the event of a Communications failure between the Terminal and LNGC, all cargo transfer operations shall be suspended until the cause has been identified and communications between the vessels are restored.

### 8.20 ARMS CONNECTION AND COOLDOWN

#### i. LNGC'S Cargo Saturation Pressure

The LNGC's Cargo tank saturated vapour pressure during the LNG transfer should not exceed 130 mbarg. The LNGC shall notify Terminal of any deviation from these pressures.

#### ii. Upon arrival at the terminal

The LNGC must be lined up with the correct configuration of shore arms to be used. The LNGC must have a set of strainers used during loading operations, and it is very rare that any foreign objects are ever encountered; nevertheless, it shall be ensured that these strainers are fitted. Since electrical insulation is installed on the swivel no.5 of the Style 80 of each arm, hence there is no need to use the static electrical bonding wire between the LNGC and the terminal.

Discharging LNG from the Ship will normally be carried out through three liquid Unloading arms on the LNG Berth; any deviation will be discussed in the Pre-Ops meeting.

Vapour requirement for the Ship's cargo tanks will be sent through a dedicated vapour return arm by lining up shore BOG Compressor with the required set pressure as confirmed by the vessel. In case shore is unable to supply vapour to the vessel, vessel to keep ship's vaporiser ready to maintain the tank pressure. 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 loading arms manifolds, the loading arms and the LNGC's manifold end-piece will be purged using Nitrogen gas supplied by the terminal. This also serves as a pressure test to confirm that the joint between the LNGC and the loading arms is tight and leak free. Obviously, at no point should air be allowed to enter into the cargo system.

Purging will be deemed to be completed when the O<sub>2</sub> content of the manifolds is less than 1%. Before proceeding further with any activity, the LNGC will start a water curtain along the hull immediately under the manifold area (to avoid hull damage in the event of leakage).

#### 8.21 COOL DOWN OF LOADING ARMS

The cool down rate will be agreed during the pre-transfer meeting between the LNGC and the Terminal. LNGC's spray pumps will be used for this purpose as requested by the Terminal. Initial cool down will be done at the flowrate of 10-20 m<sup>3</sup>/hr. The cargo flowrate will be increased only after receiving instructions from the shore. For an efficient arm cool down process, the Terminal requires 200 m<sup>3</sup>/hr – 300 m<sup>3</sup>/hr flow rate of LNG to complete unloading arms cool down in 1 hour 45 minutes approximately. Arms cool down is completed once there is liquid LNG present at the Terminal's end and required temperature is achieved at terminal end of arms.

The LNGC shall provide LNG at approximately 1.0 to 4.0 Barg at a reduced flow required for cool-down of the unloading arms. The Terminal will carry out initial cool-down of unloading arms and ask the LNGC to increase or decrease the supplied LNG pressure required as per Terminal's cooldown procedure. The LNGC is responsible to ensure the effective cooling down of its pipeline system in a timely manner, so that no delay is caused in cargo operations.

#### 8.22 LNG TRANSFER

The bulk transfer procedures detailed in vessel's cargo plan will be discussed and agreed in the PCTC. The bulk transfer of LNG and cargo operation including BOG management is controlled by the terminal CCB, in close cooperation with LNGC. It is the responsibility of the LNGC's Master to monitor the pressure in their tanks and keep the terminal informed. A free flow vapour exchange will connect the LNGC with the Terminal. If at any time during the operation the vapour pressure is reaching an agreed upon limit, or is unable to be controlled, the bulk transfer of liquid should be slowed down or stopped.

The commencement of cargo unloading shall be mutually agreed between the Terminal and LNGC. Max initial rate is 1000 m<sup>3</sup>/hr which must not be exceeded. Once both LNGC and Terminal sides are found to be ok for ramp up, then ramping up may gradually be carried out. The LNGC shall notify the Terminal of the time it starts the first and subsequent pumps. Additional pumps shall only be started after the Terminal has verified its ability to handle the increased unloading rate and requests the LNGC to start the additional pumps. Each unloading arm has a rated capacity of 5,000 m<sup>3</sup>/hr (3 arms = 15,000 m<sup>3</sup>/hr). Vapour arm flow rate is max 15,000 m<sup>3</sup> / hr. The maximum bulk discharge rate will be confirmed by the Terminal during the PCTC.

The LNGC and the Terminal will monitor the unloading rate, temperatures, and pressures throughout the cargo transfer operation. The LNGC is to notify the Terminal hourly of the quantity remaining on board the LNGC, the unloading rate and the estimated time of cargo completion. Throughout cargo operations, Vessel's tank pressure not to exceed **75%** of MARV setting under any circumstances.

Completion of cargo unloading shall be done accordingly when the LNGC is left with the agreed heel quantity to remain onboard. In the event that the LNGC is to heel out (i.e., for passage to dry dock) the terminal shall be notified in advance of this requirement detailing the additional time required to undertake the activity. This amount shall be agreed by the Terminal and LNGC during the PCTC, considering the remaining capacity in the shore storage tanks. The LNGC shall notify the Terminal one hour prior to commencing cargo unloading ramp down. The LNGC shall notify the Terminal of the time it stops a pump and the pump number.

If conditions require that cargo unloading be stopped, the Terminal or LNGC should endeavour to notify the other party beforehand.

### 8.23 COMPLETION OF LNG TRANSFER

LNG transfer will be stopped by the LNGC when the agreed upon discharge quantity has been delivered, or the Terminal has topped up to its maximum safe cargo tank levels.

Upon completion of cargo both the Terminal and the LNGC should have personnel standing by the manifold and freshwater hoses should be rigged and ready for use in assisting with the ice freeing operations on the lines.

### 8.24 LIQUID FREEING, PURGING AND DISCONNECTION OF LOADING ARMS

Once LNG transfer has been complete, Manual valves to be closed on LNGC whereas ESD valves on LNGC shall be kept open until loading arms are liquid free. Supply of Nitrogen will be lined up as agreed in the pre-transfer meeting.

The ice freeing of the loading arms should be started as soon as possible after commencing nitrogen purging of arms by spraying water on the outside of the arms by means of the rigged fire hoses. All the arms are drained as per Terminal's procedure until liquid free.

The liquid and vapor arms will be drained to be free of LNG and purged with nitrogen (Hydrocarbon Content < 2 % By Vol in a nitrogen background) by the Terminal prior to disconnection as per SIGTTO LNG Transfer Arms and Manifold Draining, Purging and Disconnection Procedure. After draining, all arms shall be purged with Nitrogen. Supply of Nitrogen will be lined up as agreed in the pre-transfer meeting. All arms shall be purged to the requirement and satisfaction of Terminal.

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

**The master shall ensure that steps are taken to prevent inadvertent operation of LNG carrier ESD/manifold valves that may result in a release of LNG or vapor through the manifold at the time of disconnection.**

**LNG Carrier personnel should remain at a safe distance from the loading arms while these are manoeuvred by the Terminal personnel.**

Once arms have been warmed up and purged, the liquid and vapor arms will be disconnected and brought one by one above the manifold platform of the LNGC to allow for fitting of the blank. Post disconnection and blanking all arms shall be moved back to the stowage position and parked on the terminal side. The Master is required to aid from his crew at the LNG Carrier's manifold for communication purposes with the terminal during arm draining/purging and disconnection.

### 8.25 LNGC UNMOORING AND DEPARTURE

Once LNGC is ready in all respect to depart, the Master shall notify the agents in consultation with the Terminal representative who will book departure Pilot as per DPCL Port guideline. Unmooring shall take into consideration the prevailing environmental conditions. All LNGCs are required to follow unmooring sequence and Port/Terminal's procedures during un-mooring operations. Tugs will assist the LNGC by pulling the LNG parallel away from the terminal. Tugs shall remain attached until the LNGC is well clear of the terminal.

Pilot shall disembark at a position mutually agreed with vessel's Master.

## **9. CUSTODY TRANSFER MEASUREMENT**

The LNG Carrier's Master shall ensure that the LNGC's custody transfer measurement system shall be in compliance with the requirements of the Terminal's LNG Measurement Manual, including calibration of LNG tanks, tank gauge approval and accuracy, liquid level gauging device accuracy - both primary and auxiliary systems, temperature gauging devices, pressure gauging devices etc.

The Boarding Officer from Terminal will be present and witness LNG measurement at the start and end of transfer operations. The Terminal reserves the right to place a certified cargo surveyor on board the LNG Carrier.

All CTMS surveys for level, temperature and pressure, list & trim shall be made at the same time. During this period in which the readings are taken, no LNG cargo, ballast, boil-off gas, fuel oil or other transfer activity will be carried out.

The opening CTM will be conducted upon the confirmation of stoppage of all spray pumps and compressors and shut off of the gas master valve to the boilers or engines or to any other gas consuming unit unless gas consumption during custody transfer is planned to take place. Parties may explicitly agree to allow gas consumption in the ship's engine room during the time between the opening and closing custody transfer surveys. The BOG used for fuel by the vessel in port should be quantified. The method of quantifying the BOG consumed in the engines, if any, should be agreed upon by the parties involved.

The closing CTM will be made immediately after unloading is completed. Accordingly, the second gauging will be conducted upon the confirmation of shut-off of the manifold ESD valves and gas master valve unless gas consumption during the custody transfer has taken place, with transfer pumps off and allowing sufficient time for the liquid level to stabilize.

For an accurate volume measurement, it is recommended that LNG piping on the LNG carrier's deck including manifolds be in an identical inventory condition during both CTMS. The piping should either be completely filled with LNG both during the opening custody transfer (i.e. before unloading) and the closing custody transfer (i.e. after unloading) or, provided that draining is possible before the closing CTMS, alternatively be drained during both the opening and closing CTMS. Where the piping is drained before or after the CTMS measurement, it should be done for sufficient time to fully empty the piping.

### **9.1 OPENING CUSTODY TRANSFER MEASUREMENT (OCTM)**

Before the LNGC's manifolds are opened at the start of line cool down the Opening CTM shall take place.

The CTM on LNGC shall be witnessed by an independent surveyor and the Terminal's representative. The CTM shall be conducted in compliance to the latest versions of GIIGNL's LNG Custody Transfer Handbook and Terminal's Measurement and Testing Manual.

Engine room fuel meters, GCU counter and other allowed consumption shall be recorded at the start of OCTM. Gas burning shall be stopped and Master Gas Valve to vessel's engine room shall be shut during CTM. In the event of primary gauging system failure, secondary gauging system shall be used for CTM. LNGC shall be upright and at even keel during Opening CTM.

### **9.2 CERTIFICATE OF MEASUREMENT OF CARGO**

The Opening CTM on LNGC shall be witnessed by an independent surveyor, who will prepare the "Certificate of measurement" and provide a copy to the LNGC's Master.

### 9.3 CLOSING CUSTODY TRANSFER MEASUREMENT (CCTM)

Closing CTM shall occur on completion of draining of loading arms and confirmation that all the LNGC's manifold valves are closed. The Closing CTM on LNGC shall be witnessed by an independent surveyor and Terminal's representative. The CTM shall be conducted in compliance to the latest versions of GIIGNL's LNG Custody Transfer Handbook and Terminal's Measurement and Testing Manual.

All cargo lines shall be drained for at least thirty **(30)** minutes prior to Closing CTM. Gas burning shall be stopped and Master Gas Valve to vessel's engine room shall be shut during CTM. In the event of primary gauging system failure, secondary gauging system shall be used for CTM. LNGC shall have zero list and as close to zero trim as practically possible during CTMS.

### 9.4 POST TRANSFER MEETING

A post-transfer meeting will be held in the LNGC's meeting room immediately after the cargo unloading.

In presence of Chief Officer or another designed officer, terminal representative, and third-party cargo surveyor a CCTM report is printed and signed.

The Boarding Officer or the terminal representative, Cargo surveyor and the LNGC Master's designated person in charge shall attend this meeting.

### 9.5 GAS BURNING:

In the event of gas burning deemed necessary by the ship, the burnt gas shall be measured and accounted in accordance with the throughput agreement or relevant Sales Purchase Agreement. Gas flow readings are to be recorded prior to and after burning of gas in the vessel's boilers and/or generators. Flow meter reading shall be noted at the time of opening and closing CTMS.

**Note: Terminal will not receive any vapour from the ship.**

## **10. SAFETY RULES AND PRECAUTIONS**

### **10.1 RESPONSIBILITY OF THE MASTER**

The safety requirements have been developed based on OCIMF's ISGOTT, SIGTTO and other industry accepted standards. Nothing contained in this book shall be construed as relieving the Master from his responsibility for the safety of his vessel at any time. The main responsibility for the safe operations conduct on board of the LNG Carrier rests with LNG Carrier's Master. The LNG Carrier's Master shall ensure that he and all other persons on board including LNG Carrier's crew carefully follow all rules, regulations, formalities, measures, and orders given by Terminal Operator or other authorities. The LNG Carrier's Master shall ensure that all agreements made between the Terminal and LNG Carrier's crew are carefully observed and available information about Terminal is kept up to date. The LNGC Master shall cooperate closely with the Terminal during the entire operation. LNGC Master shall at all times retain sufficient crew on board to safely operate their vessels as per Safe Manning Certificate.

The LNG Carrier's Master shall provide the following of the LNG Carrier's documents upon request of the Terminal Representative:

- Cargo handling manual
- Emergency procedures
- Statutory certificates

### **10.2 SAFETY PRECAUTIONS**

Master and ship's officers are expected to be familiar, and to comply with the latest edition of the International Safety Guide for Oil Tankers and Ports (ISGOTT), and the Liquefied Gas Handling Principles on Ships and at Terminals (LGHP). The Master and crew of visiting LNGC must take all necessary safety precautions (whether or not so advised by the Terminal Representative), keeping in mind the hazards of LNG discharge operations, weather conditions and any other circumstances requiring special care or caution.

### **10.3 STABILITY / DRAFT / TRIM**

Masters shall ensure that vessel's stability remains intact at all times throughout the operations and stay inside port. Periodical checks of stability parameters must be carried out to verify the same.

Masters shall also ensure that vessel remains upright at all times and does not get trimmed by head under any circumstances and conditions whilst alongside the LNG berth and inside port.

The maximum permissible draft alongside this Terminal is 12.5 (Twelve decimal five) metres and maximum trim permissible for the vessels is three (03) metres by stern *except during CTM*.

### **10.4 PERSONAL PROTECTIVE EQUIPMENT (PPE)**

Terminal operates with a strict policy with regard to PPE. Masters of vessels are expected to ensure that all personnel on board their vessels are suitably attired for the duties expected of them during the vessel's visit while it is located in the Exclusion Zone.

### **10.5 SHIP TO SHORE SAFETY CHECKLIST**

Prior to the commencement of cargo transfer operations ISGOTT Ship Shore Safety Checklist shall be filled by LNGC. Also, the Master of LNGC is required to sign a Safety Letter.

Refer to Annexure G for the Safety Letter and Annexure H for SSSCL.

## 10.6 STATE OF READINESS

### 10.6.1. Main Engine

When moored alongside berth, main engine of the LNG vessel must remain in the state of readiness or on not exceeding fifteen (15) minutes' notice such that she is ready at all times to move out under her own power confirming to the requirements of Ship-to-Shore Safety Checklist. Under no circumstances and conditions any immobilization of main engine is permitted until LNGC leaves the Port channel safely.

### 10.6.2. Maintenance Restrictions

Repair and/or maintenance work, of any kind affecting equipment, fittings and machineries being used in cargo transfer operations and means of propulsion & steering and safe departure is strictly prohibited. In the rare circumstances repair and/or maintenance work in relation to aforesaid equipment, fittings and machineries is necessitated for the immediate safety and prevention of unsafe conditions, the same shall be brought to the notice of Terminal Marine Head and DPCL. With specific and express approval from the Terminal authorities LNGC Master may be permitted to go ahead for any repair, subject to submission of work plan, applicable permits and deployment of effective measures of monitoring and supervision.

Hot work on deck and other open areas including hammering, chipping, and operations involving the use of any power tools are strictly prohibited on board the LNGC during her stay alongside berth.

## 10.7 BATHING, SWIMMING AND FISHING

Bathing, Swimming, and fishing are not permitted by the Terminal/Port Authority while the vessel is moored alongside berth, under in/outward manoeuvring and stay at anchorage. No crewmember of the vessel should indulge in swimming or fishing.

## 10.8 EMERGENCY TOWING WIRES

Rigging of Emergency towing wires is not mandatory at this Terminal. However, vessel may rig it as per ISGOTT guidelines.

## 10.9 OUTBOARD ACCOMMODATION LADDER

LNGC Master shall ensure that the outboard accommodation ladder is kept ready for lowering in case of emergency. It may be kept at deck level until required.

The outboard accommodation ladder on the seaside of the LNGC shall be the alternate means of access to the LNGC for agents, authorities, crew etc. LNGC master shall ensure that in case required it is safely rigged, manned and safety procedures are observed during transfer of personnel to/from LNGC.

## 10.10 OUTBOARD LIFEBOAT

Whilst the LNGC is alongside berth, LNGC's outboard / freefall lifeboat shall be kept in the state of readiness for lowering in case of dire emergency only and subject to consent given by Terminal.



### 10.11 LIGHTING

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

### 10.12 SUSPENSION OF OPERATIONS

After due consideration and mutual assessment, LNG transfer operations may be halted during any period of severe and/or abnormal conditions such as heavy electrical storm in the vicinity, thunderstorms, excessive wind / sea / swell which endanger the safety of the LNGC and Terminal facilities. LNGC Master and Terminal Marine Head shall liaise closely in all matters that may need a suspension of operations. If operations are suspended, they shall not commence until LNGC Master, DLTPL and DPCL are in agreement of operations.

### 10.13 EMERGENCY SHUTDOWN AND DISCONNECTION

The loading arms on jetty are fitted with 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. This can be activated manually from the Local Control Panel (LCP) or automatically when design envelope operating limits are exceeded. Alarms are set to warn the operators when approaching the limits.

The ESD system at Terminal includes following main functions:

- |                         |   |   |
|-------------------------|---|---|
| <b>ESD1 &amp; ESD 2</b> | - | <b>Unloading Systems</b>                            |
| <b>Other ESDs</b>       | - | <b>For General Terminal Shutdown and facilities</b> |

The primary action of ESD1 is to stop the unloading operation (including ESD of the ship system), to close the ESD valves on the unloading and vapour return lines in order to limit the liquid / gas inventory and to isolate the unloading system from LNG tanks vapour recovery and send-out systems.

The emergency sequence two (ESD2) actuates the closure of the ERS valves and the arm emergency disconnection system (PERC). This can be required by the Ship or the operator on the jetty, calling the central control building (CCB) due to severe storm, leak, or another serious event. It is automatically initiated by the arm displacement proximity switches. The closure time of ERS is 5 seconds.

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 of 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:

- If ship ESD is activating, then shore ESD-1 will be activated.
- If shore ESD-1 is activating, then ship ESD will be activated.

### SHIP UNLOADING ARM STATION

The emergency shutdown logic of this station is designed to perform two main step actions in ESD 1 and ESD 2 respectively:

- i. Step action – closing of the LNG / NG valves. – ESD 1
- ii. Step action – the disconnection of the arms LNG / NG from the Ship. – ESD 2

#### **1<sup>st</sup> Step - Closing of the LNG / NG valves:**

The arm PLC sends ESD-1 signal to the Terminal Safety Control System to perform:

- The closing of the LNG / NG valves on the terminal.
- The closing of the LNG / NG valves on board of LNG carrier (by terminal ESD 1 to Ship ESD).

These actions can be performed by two modes:

- i. Manually by operator
  - By the emergency shutdown push button on the jetty platform.
  - Manual break glasses in strategic locations
  - By the emergency shutdown push button onboard the ship.
- ii. Automatically when one of the Ship unloading arms reaches the first limit of its operating area.

For that purpose, several proximity switches are installed on each loading arm.

#### **2<sup>nd</sup> 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.

- i. Automatically

The emergency disconnection system, also called Emergency Release System (ERS) is activated automatically when one of the loading arms reaches the second limit of its operating area.

- ii. Manually

The emergency disconnection is performed also by the action of the Process Field Officer on the dedicated push button installed in a protective cap on the LCP.

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.

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 LCP.

The LCP 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 a Safety Control System (emergency shutdown system) to set this installation in safe condition in all circumstances with or without Ship at the jetty.

ESD 1 will be activated by:

- Ship's ESD.
- Loading arm ESD signal.
- The field located ESD 1 push button.
- The ESD 1 push button in the central control building and Jetty Control Room of Terminal.
- The fire, gas and spill detections at the jetty head signal coming from the FSGDS.

- The general emergency shutdown ESD 4 (Plant's ESD) procedure.

This activation will induce the following actions:

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

This ESD 2 system will be activated by:

- The Unloading arm ESD (as described above if MLA is outside the working envelope).
- The ESD 2 push button in the central control building and Jetty Control Room of the LNG plant.

ESD2 will actuate closing of ERS double valves and open PERC. Both ERS double valves will be closed at the same time.

### 10.14 MOORING ROPE EMERGENCY RELEASE

In case of emergency, LNGC Master can request the Terminal Jetty Control Room (JCR) for release of mooring lines. Prior acting on such a request, if time permits, the Radio Officer in JCR shall consult DPCL Port authorities and ask for arranging pilot and tugs.

The severity of an emergency release and possible consequences of the LNGC should not be understated.

### 10.15 RADAR

The use of radar during cargo operations is strictly prohibited.

### 10.16 RADIO TRANSMISSIONS

The vessel's main radio transmitters shall be switched off and the aerials disconnected and earthed while vessel is alongside the terminal. All handheld radios shall be ex-proof and intrinsically safe. VHF radios and AIS shall be set to 1W. The use of LNG Carrier's radio installation is only authorized for receiving purposes.

### 10.17 MOBILE TELEPHONES, PAGERS, AND OTHER ELECTRONIC ITEMS

The use of such equipment is forbidden, except in designated safe areas within vessel's accommodation area and with the Master's permission. Exemption is granted to equipment which are intrinsically safe or ATEX/IECEx certified for use in flammable atmosphere.

### 10.18 SPARK ARRESTOR

All vessel exhausts including exhaust from emergency generators shall be fitted with spark arrestors.

### 10.19 GENERAL FIRE PREVENTION MEASURES / SAFETY PRECAUTIONS

Industry Standard practices and fire prevention measures shall be adhered to consistent with the Ship – Shore Safety Checklist, including the following:

- the LNG Carrier's water spray system must be available for use at all times
- the LNG Carrier's fire main system must be pressurized at all times
- the LNG Carrier's fire hoses fitted with jet/spray branches ready for immediate use

- the LNG Carrier's portable dry powder fire extinguishers in the manifold area and the LNG Carrier's fixed dry powder system must be ready for immediate use
- all of the LNG Carrier's external doors, windows and portholes must remain closed
- the LNG Carrier's air conditioning and ventilator intakes likely to draw in air from the cargo area must be closed; however, air conditioning must be maintained on partial recirculation in order to maintain a positive pressure in the accommodation
- the LNG Carrier's window type air conditioners must be disconnected from their power supply
- portable and fixed electric and electronic devices and equipment used in the LNGC's hazardous areas must be of approved type (ATEX/IECEX certified) for such areas and satisfactorily maintained so as to ensure that their original certificates are not jeopardized
- the use of Naked Lights is strictly prohibited.
- smoking in the terminal area is strictly prohibited and smoking on board the LNG Carrier is only authorized in the designated smoking areas, unless previously agreed upon during the pre-transfer meeting
- hot work including hammering, chipping, and operations involving the use of any power tools are prohibited on board the LNG Carrier
- In addition, the LNG Carrier shall maintain a fire watch system, which includes routine monitoring of spaces and areas not continuously manned.

## 11. FIRE FIGHTING

### 11.1 FIRE FIGHTING PHILOSOPHY

#### 11.1.1. Fire on LNGC

Fire on board LNGC shall be notified immediately to the JCR and CCB by available means and alert the LNG berth staff by sounding agreed emergency signal on board the vessel. Radio contact shall be made with the Terminal & Port Control to advise them of the emergency.

All cargo operations shall be immediately suspended, and preparations made for emergency evacuation will be made. The DPCL's PSS and DLTP's CCB shall be notified who shall initiate emergency procedures as required.

Ship's personnel shall fight the fire under the direction of their Master. Terminal tugs shall assist as required and the jetty fire-fighting equipment shall be activated.

The LNGC Master is On Scene Commander for fire aboard the LNGC and terminal fireteam to be standby at jetty to provide any support as requested by vessel master. Terminal ambulance will also be standby near JCR to provide medical support.

#### 11.1.2. Fire on LNG Berth

In case of fire detected on the berth by the LNGC, it must be immediately reported to terminal's CCB and JCR by Phone/hot line or VHF and to the Dhamra PSS VHF Ch. 14; additionally, ship will also sound the agreed emergency signal on board the vessel. All cargo operations shall be immediately suspended, and preparations will be made for emergency evacuation of berth. Terminal's fire fighting team shall take charge of the fire fighting and activate all available fire-fighting equipment at Jetty. In case of fire becoming uncontrolled, emergency departure of the vessel may be planned with consent of the master and port authorities.

### 11.2 FIRE FIGHTING EQUIPMENT

LNG vessel's fire-fighting appliances, including main and emergency fire pumps, shall be ready for immediate use and pressure shall be maintained on the fire main at all times (fire main pressurization required only during cargo operations);

At least two fire hoses, one forward and one aft of the cargo manifold area, fitted with fog nozzles, shall be connected to the fire main and ready for use. Portable dry chemical and CO<sub>2</sub> fire extinguishers shall be placed in the manifold area. Fire monitors ready for immediate use shall be directed towards the manifold area.

### 11.3 TERMINAL'S FIRE FIGHTING FACILITIES

#### 11.3.1. Jetty Fire-Fighting Facilities

These include:

- i. Fire water distribution network
- ii. Fixed spraying systems
- iii. Water curtain system
- iv. Monitors and hydrants
- v. Remote Operated tower monitor HVLRM – 02 nos.
- vi. Water curtains – 03 nos.

- vii. Dry chemical powder skids -
- viii. Inergen system
- ix. Fire & Gas detection and Alarm system
- x. Mobile and portable firefighting equipment
- xi. Fire intervention pick-up – 01 no.
- xii. Miscellaneous fire-fighting equipment such as portable fire extinguishers, protective clothing etc.
- xiii. Terminal also has two (02) nos. mobile fire tenders equipped with following:
  - a. Foam Tender – 03 nos.: Water 4500 litres + Foam 3600 litres
  - b. DCP Tender – 01 no. of capacity 2000 Kg

### 11.3.2. Port's Fire-Fighting Facilities for LNG terminal

DPCL's fire-fighting capability includes following:

- i. FiFi - I (IRS AGNI-I) firefighting system on 2 tugs. Two of the Tugs (Dolphin 31 and Dolphin 32) are equipped with FiFi.



## 12. SECURITY IN THE PORT

### 12.1 SECURITY

DPCL is responsible to ensure the safety and security (including prevention of trespass) of the Exclusive Area, Berth Components, and the Topsides at all times from the sea ward side approach. They shall at all times, as per Good Industry Practice, ensure the safety and security (including the prevention of trespass) of the land, under their possession/control outside the jetty and plant area. DPCL ensures the availability of security officers and use speed boats etc., for the patrolling of the Security Exclusive Area during daytime as well as night.

The LNGC will be responsible for the safety and security of the LNGC itself as per ISPS regulations and handles all access and security in cooperation with DLTP/L/DPCL.

DLTP/L is responsible to ensure the safety and security of the land under its possession/control (including prevention of trespass) but restricted to safety/security from the land side only. At the terminal, there are many CCTV cameras, which monitor the ISPS security and Terminal operations.

### 12.2 CONTROLLED ACCESS TO THE TERMINAL AND LNGC

DPCL and the DLTP/L's Dhamra LNG Terminal are ISPS compliant facilities. The entire LNG Jetty within its boundaries is restricted area. Effective access control and appropriate measures as per prevailing security level remain in place at all times. Terminal Security and access is the responsibility of DLTP/L Terminal. Access to DLTP/L Terminal is strictly limited to Terminal personnel, approved visitors, or contractors and LNGC crew.

LNGC Master shall ensure that appropriate security measures as per vessel's SSP and flag state requirements remain in place to ensure controlled access to the vessel.

Vessels are required to furnish **PANS** (Pre-Arrival Notification of Security) duly completed at least ninety-six (96) hours prior arrival to DPCL keeping DLTP/L in copy. **Refer to PIB for the PANS.**

### 12.3 NO UNAUTHORISED PERSONS / UNAUTHORISED CRAFT

DPCL and DLTP/L require that no unauthorised persons board LNGCs within the Port Limits. Masters are required to check the identity of all persons boarding their vessel. Effective access control and 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. Terminal personnel will carry photo identity proofs at all times.

No unauthorised crafts are allowed alongside the vessel whilst she is inside DPCL port Limits without permission of the Port & Terminal. It is the duty of the vessel to ensure that such craft do not come or remain alongside.

### 12.4 LIFEBOAT LOWERING

Lifeboats should not be lowered into the water (except in an emergency) without the permission of the DPCL and DLTP/L Terminal.

### 12.5 INTERNATIONAL SHIP & PORT FACILITY SECURITY CODE (ISPS)

The DPCL Port and DLTP/L LNG Terminal is in compliance with the ISPS Code detailed in SOLAS Chapter XI. Vessels are required to confirm compliance with the Code in the Standard Pre-Arrival Message.



## **13. ENVIRONMENTAL PROTECTION**

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### **13.1 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 vicinity. Any pollution affecting the well-being of the area is viewed very seriously and heavy penalties will be imposed, in addition to any clean-up costs.

### **13.2 SEA AND OVERBOARD DISCHARGE VALVE**

Overboard discharge valves on the bilge system 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 Limits, 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/dolphins. Where this cannot be achieved mechanically then suitable baffle boards shall be rigged to the satisfaction of Terminal/Port.

### **13.3 BALLASTING / DEBALLASTING**

The Terminal does not have ballast or oily water reception facilities. To protect the interests of all parties LNGC Masters should be guided as per below:

- i. Only the discharge of "clean" ballast from Segregated Ballast Tanks (SBT) is permitted
- ii. All ballast water, other than that contained within SBT, shall be retained on-board
- iii. Any such discharge shall be in compliance with the relevant IMO guidelines
- iv. Masters must take all necessary precautions to minimise and control the introduction of unwanted aquatic organisms and pathogens from the vessel's ballast water by adopting a ballast water exchange and sediment removal procedures in accordance with the relevant IMO Guidelines and Recommendations under MARPOL Article 2 - Annex Section B

### **13.4 TANK CLEANING / GAS FREEING**

Tank cleaning and gas freeing are strictly prohibited at this Terminal.

### **13.5 OIL TRANSFER**

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

### **13.6 BILGE DISCHARGE**

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

### **13.7 VENTING OF GAS INTO ATMOSPHERE**

Venting of natural gas to atmosphere is not permitted during normal operations. The need for emergency venting shall be minimized through the process of management of cargo tank pressure and use of allowed consumption on board the LNGC.

The water spray deluge systems shall be in use and all ventilation systems secured during any venting event.

Under normal operating conditions venting cargo vapours to the atmosphere is not permitted. The LNGC shall take all necessary action to prevent such venting. In the event of an emergency situation that requires venting, local cold vent facility at Terminal shall be utilized only after mutual consent of Terminal and LNGC. The Terminal shall be notified of such emergency.

Gas freeing of any of the LNGC's cargo tanks and fuel oil tanks to the atmosphere is prohibited alongside the Berth and/or in the Port area.

### **13.8 LEAKS AND SPILLAGE PREVENTION**

A strict and continuous look-out shall be kept on board the ship to detect any spill during cargo operations. Drains on the ship's discharging manifolds must remain plugged during cargo discharging operations.

Any spill during cargo operations or detection of oil film in the water shall immediately be reported to Dhamra LNG Terminal as well as to the DPCL's Port Signal Station (PSS).

### **13.9 DISCHARGING MATERIAL OVERBOARD**

It is strictly prohibited to throw any material, papers, waste or goods either solid or fluid overboard.

### **13.10 FUNNEL EMISSIONS**

Soot blowing is absolutely forbidden whilst the LNGC is moored alongside the terminal. LNGC Masters must ensure that funnel emissions are not thick & excessively black in colour. Immediate steps must be taken to eliminate sparking from vessel's funnel.

### **13.11 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 Port Signal Station (PSS), and Terminal's CCB by the most expeditious means and it should be confirmed that the information of the incident has been received by them.

Any action taken should be in conjunction with the Oil Spill Contingency Plan (OSCP) of Dhamra Port.

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.

### 14. SERVICES & WASTE DISPOSAL

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#### 14.1 CREW CHANGE

Crew Change is permitted.

#### 14.2 CREW SHORE LEAVE

Shore leave is not permitted. But in exceptional circumstances of severe sickness and necessity to hospitalise the sick person, Crew are allowed to seek medical assistance. Ship's agent shall obtain necessary clearances for same and get it signed by the appropriate authority of DLTP and DPCL. A copy of this must be provided to DLTP representative at JCR by the vessel's agent.

#### 14.3 INSPECTION SERVICES

Cargo & other inspection services are available at LNG terminal and may be appointed by charterer or owners well in advance.

#### 14.4 PROVISIONS AND STORES

Provisions and stores are available on special request from Port & Terminal authorities. All arrangements shall be made through the agent without delaying the ship schedule. Supply of provisions & stores may be allowed alongside after the loading arms are disconnected subject to DPCL and DLTP permission. **The supply of provisions and stores is not permitted during the cargo transfer operations.** Due to structure of the Jetty head, it is not feasible to use Vessel's crane for lifting of stores/spares if in bulk. Therefore, any stores/spares that can be lifted manually and transferred using the gangway can only be allowed.

#### 14.5 FACILITIES NOT AVAILABLE

- Bunkering & Fresh Water Facilities
- Waste Oil & Dirty Ballast Reception
- Sewage Disposal

Bunkering and Fresh Water services by barges are not available in this port. However, the same under exceptional circumstances with prior intimation, may be arranged through Vessel Agent. Under no circumstances these services shall be rendered whilst the LNGC is alongside LNG berth. Waste Oil & Dirty Ballast Reception services and Sewage reception facilities are not available.

#### 14.6 MEDICAL SERVICES

Medical services including primary and secondary consultation, biological and radiographic tests, and facilities for intrusive medical procedures of moderate complexity are available through the LNG vessels agents at Bhadrak. In all cases the Port & Terminal must be informed. Limited emergency medical treatment is available at the Port. **Contact details are available in Contact List Annexure O.**

#### 14.7 GARBAGE DISPOSAL

Vessel desiring to land garbage may get it arranged through their agents. The Master should request the ship's agent to make arrangement with the port operator DPCL for garbage off-landing in compliance with terminal/port safety requirements. **Disposal may be allowed alongside after**

loading arms are disconnected subject to Terminal's permission. The applicable charges shall be settled by the vessel through their agents. Refer to "DPCL Port Information Booklet" for details.

## 15. HAZARDOUS SITUATIONS AND EMERGENCY RESPONSE

### 15.1 HANDLING EMERGENCIES

Hazardous situations and emergency scenarios may develop either ashore at the Terminal and/or aboard LNGC. Utmost safety precautions shall be taken by Terminal and LNGC; any emergency scenarios emanating anywhere shall be controlled expeditiously using all means and methods as described in Terminal's Emergency Response Plan and respective Emergency Response Plans of LNGC.

In the worst-case scenario, if necessary, Emergency escape and evacuation shall take place as per laid down emergency escape routes and evacuation procedures of the Terminal. Escape routes and Evacuation procedure shall be discussed while completing Ship to Shore Safety Checklist.

### 15.2 EMERGENCY ON LNGC

Terminal and each LNGC shall have internal contingency plans or ERP to deal with any emergency situation. Actions to be taken in the event of emergency shall be discussed during the Pre Cargo Transfer Conference.

#### Action by LNGC

- Initiate emergency cargo transfer shutdown and closure of ESD valves
- Raise general alarm and initiate Emergency Response Plan as required
- Inform the terminal, of the nature and location of incident and action being taken by the LNGC and assistance required from the DLTPL and/or DPCL
- Inform the on-board Terminal Representative
- Request Tugs to be on standby and ready to provide assistance as required
- Prepare for arms disconnection and unmooring, including emergency un-mooring

#### Action by DLTPL Terminal

On detecting the LNGC's alarm, if there is any delay in the stoppage of cargo transfer, the person in charge shall activate the alarm.

The Terminal will thereafter take emergency response action in accordance with Emergency Response Plan, as deemed necessary in close coordination with the LNGC Master. This includes calling the terminal's fire team, ambulance, DPCL port tugs and Pilot or any other local emergency services for assistance.

#### **Emergency Evacuation**

##### LNGC Evacuation

**Primary means** - the LNG Jetty has a clearly signposted personnel assembly point (Near Jetty Security Post) which can be accessed via tower gangway.

**For Terminal Assembly point & escape Routes refer Annexure N.**

**Secondary means** – LNGC Crew will leave via the seaside accommodation ladder as secondary means and may use lifeboat and/or life raft as tertiary means of evacuation if need be.

### 15.3 EMERGENCY ON THE BERTH

#### Actions by the LNGC

Responsibility for responding to and controlling an emergency on the berth lies with the Terminal Management in close co-operation with the LNGC Master as per Terminal's Emergency Response Plan (ERP).

The Terminal is equipped with a Fire Water system with two remote/local controlled oscillating monitors, water curtain, fire water ring main system, and DCP fixed firefighting system.

LNGC shall adhere to their internal contingency plans to deal with any emergency. Action required by an LNG Carrier berthed alongside the Terminal will depend on the nature, location, and proximity of the incident to the berthing area. Actions to be taken in the event of any type of emergency will be discussed and agreed between Terminal and LNGC during Pre Cargo Transfer Conference and documented.

#### **Emergency Evacuation**

The LNG Jetty has a clearly signposted personnel muster area. The LNGC crew may evacuate the ship via the tower gangway and muster at the Terminal personnel muster station or use their survival craft.

Depending on the particular emergency, the primary or secondary evacuation route for the LNGC crew may be used.

### 15.4 EMERGENCY ELSEWHERE IN THE PORT

#### Actions by the LNGC and Terminal: -

The Terminal Management will consult with the LNGC Master in monitoring the emergency to assess the likely threat to which the LNGC may become exposed.

Actions taken to ensure the safety of the ship's crew, Terminal personnel, the ship and the cargo may include stopping cargo transfer, disconnecting the MLAs, and taking the LNGC away from the berth and manoeuvre out of the Port. Any decision to take the LNGC out of the Port must be jointly coordinated with DLTPL Terminal and DPCL Port Authorities. If the nature of emergency does not allow contact with DLTPL Terminal and DPCL Port Authorities then the LNGC Master in close unison may take whatever action needed to safeguard own vessel, crew's life, environment and terminal/port property.

## EMERGENCY SCENARIOS AND ACTION

### 1. FIRE/EXPLOSION ON LNGC

#### **Actions by LNGC**

- Activate emergency alarm by all means
- Follow ERP
- Initiate emergency shutdown procedures: ensure all manifold(s) and tank valves are closed.

- Mobilise on board fire-fighting response and Implement shipboard Emergency Response Procedure.
- Establish communications with Jetty Control Room and advise nature and location of incident.
- Seek additional assistance from Terminal & Port as needed e.g. onshore fire water, fire tenders. To keep terminal closely informed of the status.
- If necessary, the ship/shore firewater connection will be used.
- Request for FIFI Tugs for assistance, if needed.
- Keep main engine ready for immediate manoeuvre.
- Keep seaside gangway ready for emergency evacuation.

**Actions by Terminal**

- Initiate emergency shut down; stop cargo operations.
- Implement Emergency Response Procedure.
- Secure all sources of ignition
- Inform DPCL'S PSS and request assistance.
- Prepare for loading arms disconnection
- Commence boundary cooling of ship-shore interface and keep all FFA manned in the state of readiness. If appropriate water and spray on the berth will be activated to cool and protect shore side infrastructure.
- Water shall be activated to protect from the fire, but water should never be applied to a burning LNG pool
- Liaise with LNGC for rendering immediate assistance required
- Start log of events.
- Tug (upon arrival) to start fire pump and assist as directed.
- Establish line of communications with LNGC.
- Coordinate with Port for marine resources and support.
- Prepare to remove the LNGC under direction of pilot

**Actions by Port**

- Upon receiving initial notification send two Fi-Fi Tugs immediately to assist as needed by LNG Master.
- To keep track of scenario and inform pilot to be ready for embarkation if required. Accordingly mooring gang to be arranged as appropriate.
- Remove gangway

**2. LNG SPILL FROM LNG CARRIER****Actions by LNGC**

- Activate emergency alarm by all means
- Stop discharge operations by activating ESD; Follow own ERP.
- Verify the source of pollutant
- Inform Terminal and advise nature and location of spill.
- Isolate source of pollution and take whatever steps are necessary to prevent or minimize further pollution Impose total smoking ban on board
- Ensure all manifold and tank valves are closed.
- Confirm that all doors, openings etc., leading to the upper deck from accommodation area, engine room, control room are shut. If necessary, by location and extent of leakage, ventilators and fans are to be stopped.
- Secure all sources of ignition
- Impose total smoking ban on board.
- Initiate relevant Spill Response Procedure and Emergency Response

- Water or spray is to be applied as necessary to enforce evaporation and to direct or disperse from ignition sources.
- Mobilize on board pollution response gears as per Emergency Response Plan.
- Initiate clean up on board
- Prepare for unloading arms disconnection
- Keep seaside gangway ready for emergency evacuation.
- LNGC Master to seek additional assistance from terminal and port as needed e.g. onshore fire water, fire tenders and keep terminal closely informed of the status.
- LNGC Master to request for Fi-Fi Tugs for assistance, if needed. Tugs jet to be directed towards the gas leak area and keep doing so till all the LNG is vaporized and no vapor cloud is visible.
- Commence log of events
- Notify Terminal and Port Authority once normalcy is restored

**Actions by Terminal**

- Initiate emergency shutdown of cargo operation.
- Verify source and type of pollutant
- Secure all sources of ignition
- Inform DPCL
- Stop cargo operations; Commence log of events.
- Water or spray shall be applied as necessary to enforce evaporation and to disperse the gas cloud from ignition source.
- Prepare for unloading arms disconnection
- Evacuate all the extra manpower from the jetty.
- Deploy firefighting team and keep ambulance standby nearby Jetty Control Room.

**Actions by Port**

- Upon receiving initial notification send two Fi-Fi Tugs immediately to standby at a safe distance as advised by LNG Master.
- To keep track of scenario and inform pilot to be ready for embarkation if required. Accordingly mooring gang to be arranged as appropriate.

**3. UNCONTROLLED RELEASE OF LNG VAPOR OR LIQUID FROM LNGC****Actions by LNGC**

- Activate emergency alarm by all means
- Initiate emergency shut down and stop discharging operations
- Prepare for Loading arms disconnection
- Secure all sources of ignition and impose a total smoking ban
- Initiate water spray systems or deluge as required.
- Initiate Emergency Response Plan.
- Establish communications with Terminal and advise nature and location of spill.

**Actions by Terminal**

- Stop cargo operations; Initiate emergency shut down on LNG (if applicable)
- Prepare for unloading arms disconnection
- Initiate Emergency Response Plan
- Secure all sources of ignition
- Inform the Port Authorities
- Operate fire monitors if necessary.
- Ensure that Standby Tugs activate firefighting



- Activate water curtain and deluge system on jetty
- Stand well clear upwind
- Give instructions to Tugs
- Remaining tugs to mobilise and stand by in close vicinity

**Actions by Port**

- Upon receiving initial notification send two Fi-Fi Tugs immediately to standby at a safe distance as advised by LNG Master.
- To keep track of scenario and inform pilot to be ready for embarkation if required. Accordingly mooring gang to be arranged as appropriate.

**4. MAN OVERBOARD INCIDENT AT/NEAR BERTH****Actions by LNGC**

- Throw a life buoy with light or floating aid to the person in the water
- Raise the alarm by sounding the LNG Carrier's whistle (in accordance with LNG Carrier 'Emergency Response Plan')
- Stop the cargo operations if the person in the water is within 100m of the Terminal, inform the Terminal's Jetty Control Room and advice circumstances
- Place lookout and constantly monitor position of person in the water
- Request the Terminal to mobilize rescue from the Port Authorities
- Direct responding crafts towards the person in water
- Direct searchlights and personnel to last known position of person in the water.
- Deploy rescue boat after informing Port control.

**Actions by Terminal**

- Stop cargo operations (subject to Terminal Manager's decision)
- Inform DPCL's PSS to send the standby tug for rescue
- Stop LNG transfer if requested.
- Ensure Standby Tugs respond as directed by LNGC's Master.
- Coordinate with DPCL for search and rescue as directed
- Remaining tugs to be mobilised if required.
- Place medical services on standby.

**Actions by Port**

- Upon receiving initial notification send available tugs or marine craft immediately for search & rescue as required by LNG Master.
- Inform all the vessels berthed/anchored in the Port about man overboard incident and ask them to keep sharp lookout and share information.

**5. LNG CARRIER BREAKING AWAY FROM THE JETTY****Actions by LNGC**

- Activate emergency alarm by all means
- Initiate ESD procedures
- Clear manifold area in case of ESD2 activation
- Notify Terminal's JCR & CCB and initiate actions as per own ERP
- Prepare for Tug connection and unmooring of the LNGC, including emergency unmooring.

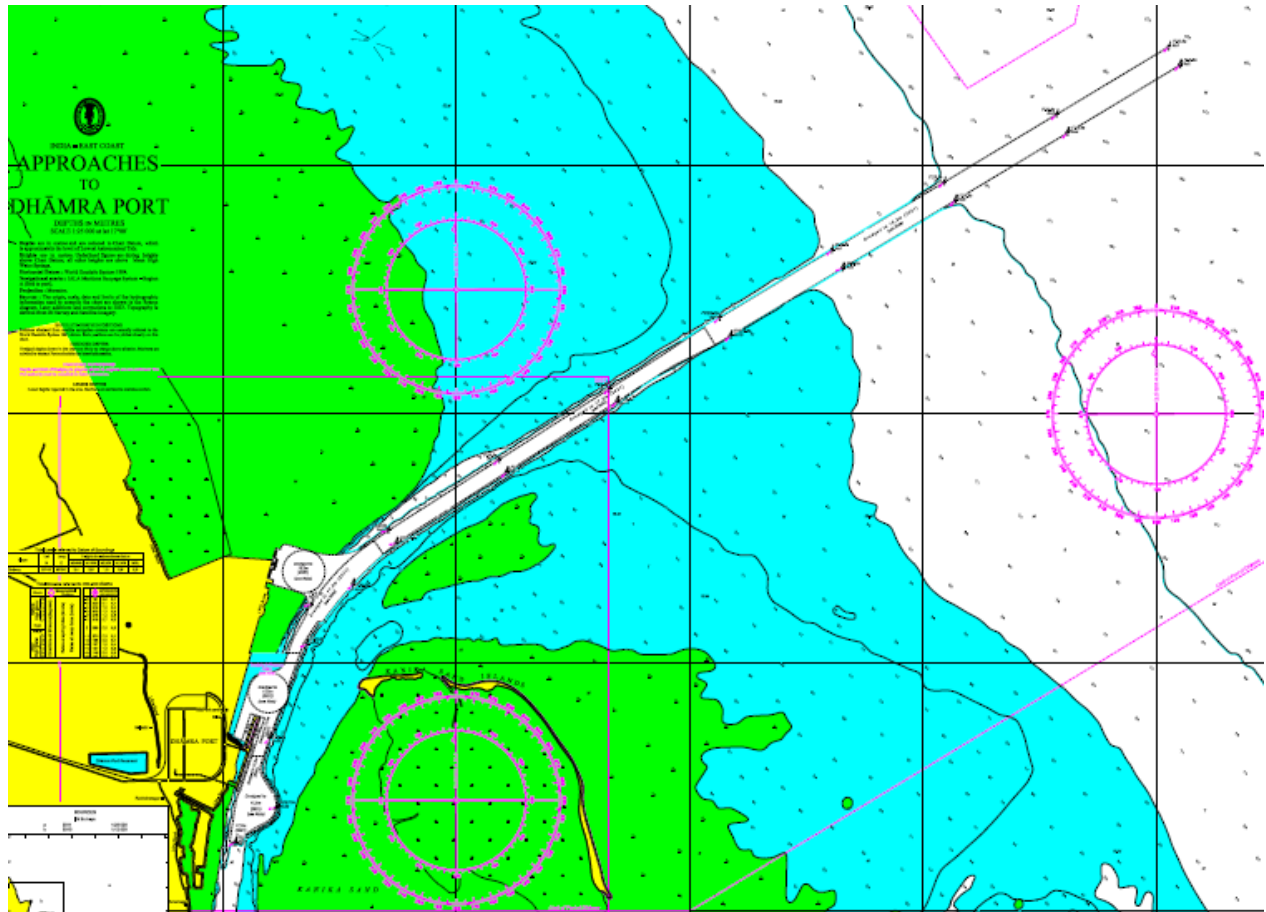
### Actions by Terminal

- Confirm/initiate ESD (emergency shutdown)
- Inform DPCL to send tugs with duty pilot immediately.
- Prepare for Loading Arms disconnection by activating ESD2 manually if arms are still connected.
- Consider activating Terminal area fire and deluge systems.
- Prepare for release of moorings of LNG Carrier.
- Remove gangway.
- Monitor unberthing of LNGC.

### Actions by Port

- Upon receiving initial notification send two Tugs immediately to standby at a safe distance as advised by LNG Master.
- Send the duty pilot for embarkation.
- Inform the inbound or outbound vessel and take necessary precautions.

## ANNEXURE A. NAVIGATIONAL CHART FOR DHAMRA PORT



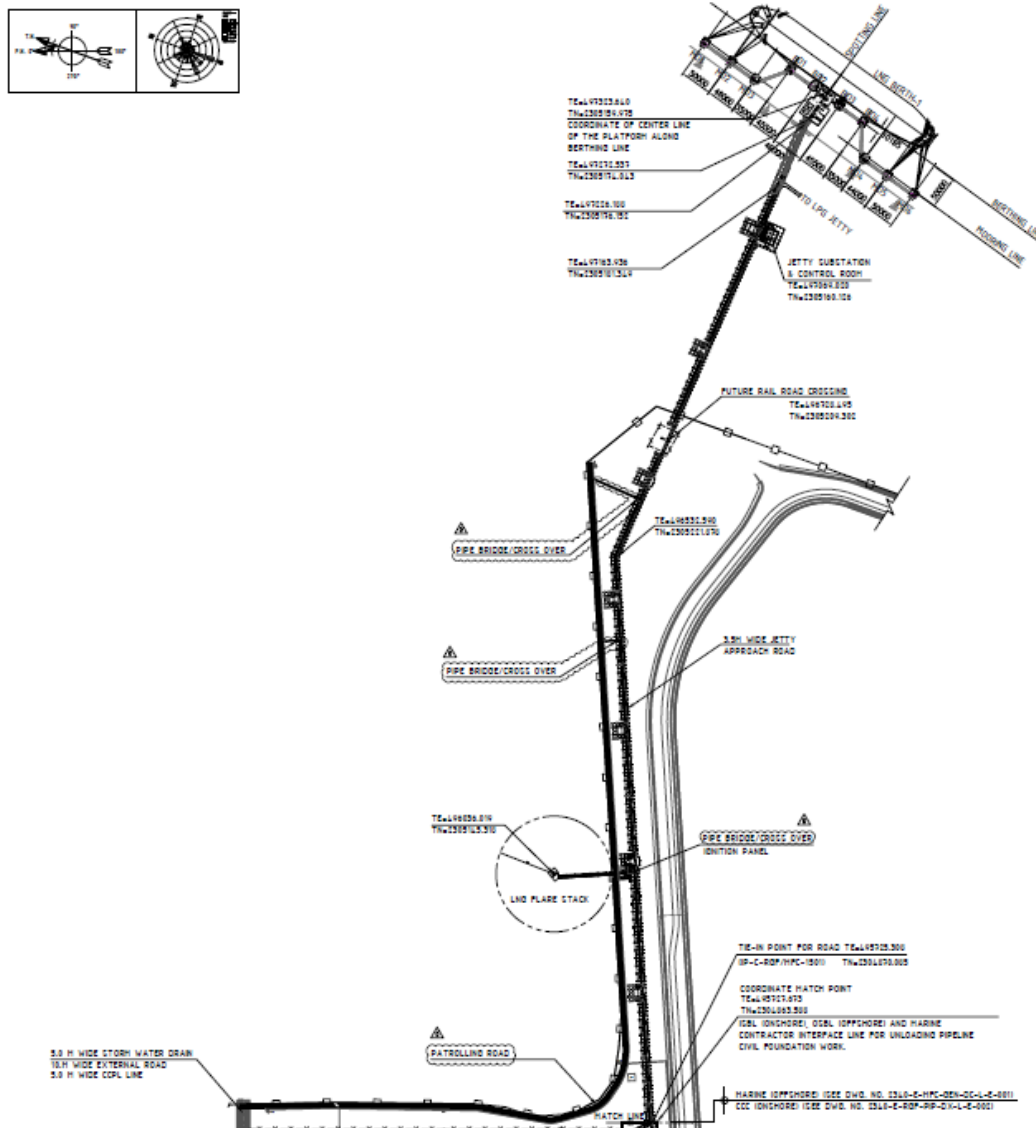
Navigational Chart IND 3038

N.B. This chart below is for reference only whereas the original chart is to be used for navigation.

## ANNEXURE B. LNG JETTY LAYOUT

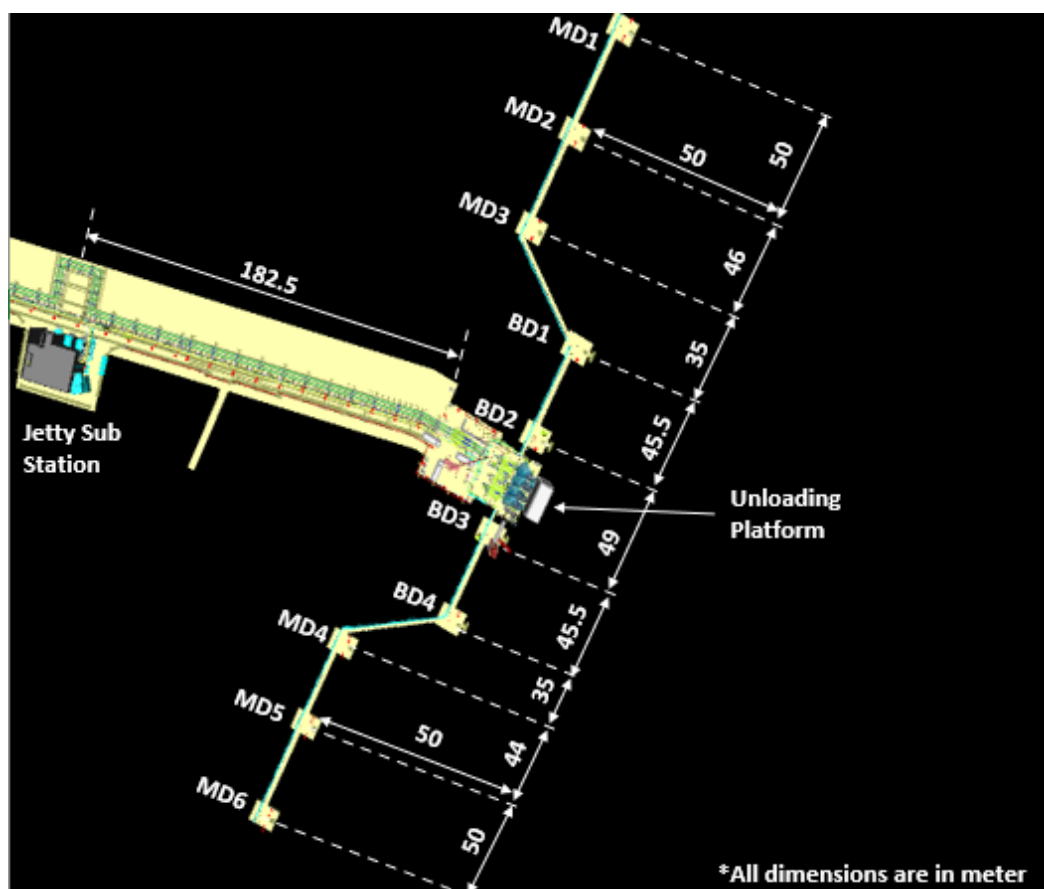
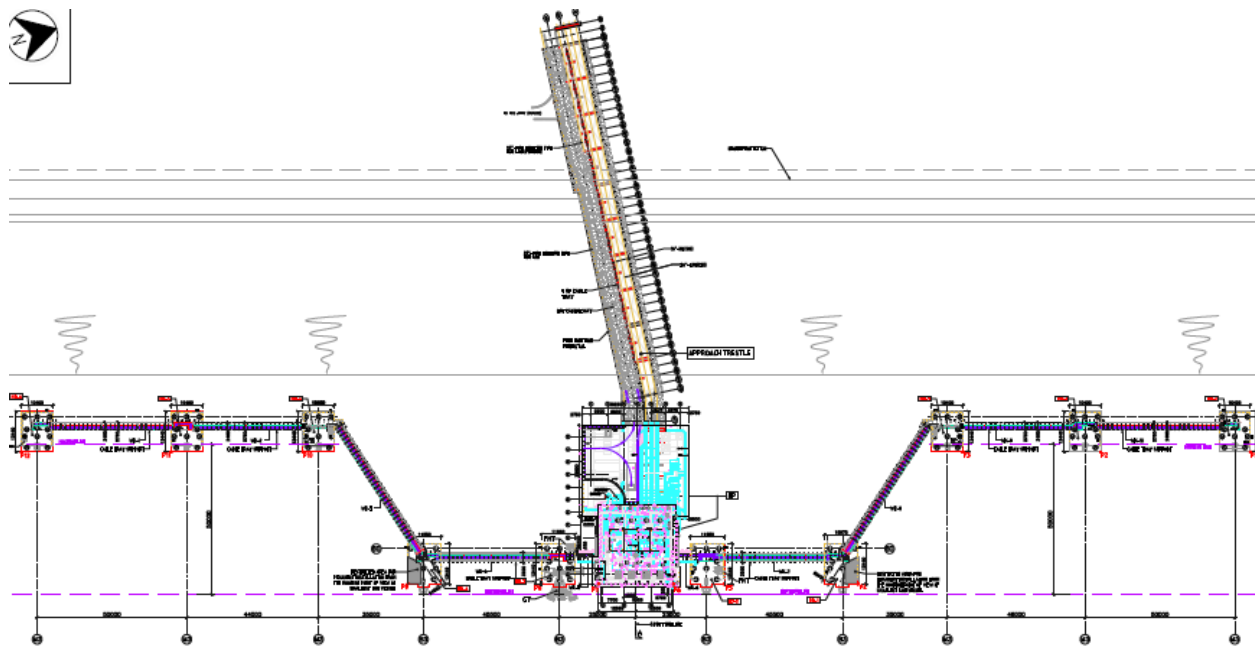


LNG berth



LNG Jetty Layout

## ANNEXURE C. LNG BERTH LAYOUT



## ANNEXURE D. SHIP NOMINATION AND REQUEST FOR APPROVAL FORM

Completed form to be submitted to DLTPL Terminal by e-mail: [sscs@adani-total.in](mailto:sscs@adani-total.in)

Request type (please tick one box only)	
New vessel - Compatibility study:	
Registered/Approved vessel - Safety screening/Refresher:	

Requesting Company Information			
Requesting Company Name:		Contact details:	

Ship Information			
Ship name:		IMO No.:	
Scheduled cargo loading date:		Scheduled unloading date at DLTPL:	
Ship Owner:		Contact details:	
Ship Operator:		Contact details:	
Ship Flag:		Port of Registry:	
Year built:		LOA	
LBP:		Breadth:	
Depth:		Summer draft:	
GRT:		NRT:	

<b>Additional Info &amp; Remarks:</b>
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Place:	Date:	[Signature] [Name]
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## ANNEXURE E. STANDARD PRE-ARRIVAL MESSAGE

1.	LNG Carrier Name + Call Sign:		
2.	Name of Master & Nationality:		
3.	Total Crew on board including Master:		
4.	Arrival Displacement:		
5.	Summer Deadweight (MT):		
6.	Tank Pressure on Arrival (Kpag or mbarg)		
7.	Draft Fore and Aft on Arrival (m):		
8.	Draft Fore and Aft on Departure (m):		
9.	Is LNGC's Navigation / manoeuvring / pilot boarding arrangement / mooring / Cargo Equipment/Anchoring Equipment. etc. in good order? State if any defect/deficiency exists.		
10.	Last 3 Ports of Call (incl. Security level)		
11.	Last Indian Port of call and Date called		
12.	Does vessel have fully operational Doppler Speed Log?	Yes / No	
13.	Does vessel have operational Bow thrusters?	Yes / No	
14.	Confirm LNGC's cargo lines will be cooled down prior arrival at Pilot Station	Yes / No	
15.	Is the gas detection system fully operational?	Yes / No	
16.	Is the IG-system fully operational?	Yes / No	
17.	Are void spaces gas free (incl. barriers)?	Yes / No	
18.	Are smoke/fire detection and fixed fire extinguishing systems fully operational?	Yes / No	
19.	Quantity of cargo nominated for discharge (m <sup>3</sup> ): Total Cargo Quantity on board (m <sup>3</sup> ): Heel Quantity to be retained (m <sup>3</sup> ): Cargo Density:		
20.	a. Ballast on board	Yes / No	
	b. Ballast exchanged		



21.	Size, rating, and standard of cargo manifold connection (m):		
22.	Maximum unloading rate (m <sup>3</sup> /h):		
23.	Anticipated unloading time (h):		
24.	Is ESD system fully operational? Note date of last test and confirm that the Emergency stops tested from all locations:	Yes / No	Date:
25.	Is overfill protection system and Pressure alarm system operational? Date of last test:	Yes / No	Date:
26.	Does the vessel have min. 1 spare mooring line and tail standby fore and aft		
27.	Confirm the length of mooring tails to be used in this call (Tick the correct option)	22m tails on all lines except springs with 11m tails	11m tails on all lines
28.	SSO contact information:		
29.	CSO contact information:		
30.	Are remotely operated manifold valves operated through a complete open/close cycle?	Yes / No	
	Are manifold valves fully operational (hydraulic + manually)?	Yes / No	
	Advise valve type:		
	Advise actual closing time (sec):	Vapour:	Liquid:
31.	Confirm receipt of 'Terminal Information Booklet', and 'Port Information Booklet'.	Received / Not Received	
32.	LNG Carrier's local agent and contact details:		

Place:	Date:	[Signature] [Name]
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**ANNEXURE F. CONDITIONS OF USE (COU)**

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**APPENDIX 1**

*Masters are requested to sign the 'Conditions of Use' as a prerequisite of  
Calling the Terminal*

THE DHAMRA PORT COMPANY LIMITED

INTEGRATED MANAGEMENT SYSTEM FORMATS MANUAL

Applicable to LNG tankers Only

The Chief Executive Officer,  
The Dhamra Port Company Limited (DPCL), Dhamra – Bhubaneswar – Odisha (India)

Dear Sirs,

I, **Capt** \_\_\_\_\_, Master (**"Master"**) of m.v.  
\_\_\_\_\_ (**"Vessel"**), owned by  
\_\_\_\_\_ (**"Owner"**) whose address is at \_\_\_\_\_  
\_\_\_\_\_ hereby acknowledge receipt of these Conditions of Use  
(**"Conditions of Use"**) of Dhamra Port (**"Port"**) and to avail the Port Facilities\* and Port Services\*  
as detailed hereunder and agree that:

- (a) The Master shall at all times and under all circumstances be responsible for the safe and proper operation, navigation and berthing of the Vessel at the Port operated by the Dhamra Port Company Limited (**"Company"**). It is further agreed the Port Management shall not be responsible for delay in pilotage, berthing, ingress or egress, delay in cargo operation, etc., for any reasons whatsoever.
- (b) The Vessel shall abide by all rules, regulations, guidelines and recommendations with reference to prevention of pollution, including pollution due to bilges, ballast water, vessel waste, garbage and the like; in addition to any other laws, rules, regulations, or procedures, declared or issued by the Government of India, or the State of Odisha, or by the Company (**"Port Management"**).
- (c) The Vessel will be held responsible for any loss or damage caused to the Port property and all costs, charges and expenses in that behalf, which shall be paid on a demand being made, without any demur and shall be responsible for, indemnify and hold harmless the Company from and against all claims, losses, damages, delays, costs (including legal costs), expenses and liabilities of every nature which involves the fault, wholly or partially, of the Master, officers or crew, including negligent navigation.
- (d) The Port endeavors that the berths, its facilities, equipment's, tugs and crafts are deployed and operated safely but does not guarantee any such safety. The Port shall not be responsible for any damage, delay or loss (including cargo loss) sustained by the vessel for any such reasons.
- (e) If the Vessel or any person on board or any object, article, substance, equipment or installation on its board sinks, grounds or otherwise becomes, or is likely to become, an obstruction threat, hazard or danger to navigation, operations, safety, health, security or environment in or adjacent to the Port (a **"hazard"**), then 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.

- (f) It is mandated that pilotage in this Port for all vessels is compulsory. The Master of a Vessel shall alone be answerable for any loss or damage caused by the Vessel or by any fault of the navigation of the Vessel in a manner as he would have been on pilotage duties.
- (g) A no due certificate shall be issued by the Port subject to clearance of all outstanding invoices by the Vessel / Owner.
- (h) All disputes between the Port and the Vessel, its Owner, Master and agents shall be subject to the exclusive jurisdiction of the Courts at Odisha in India.
- (i) Subject to condition (j), 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.
- (j) The limit of liability set out in condition (i) shall not limit, restrict or prejudice any claim or right that the Port Management / 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 Company against the Master and/or Owner under these Conditions of Use.
- (k) Notwithstanding anything above, the LNG Terminal & Company have executed a separate agreement whereby the LNG Terminal shall indemnify the Port for any liability over and above the cap mentioned in clause (i).

Signature:.....

Name: Capt.....

**(For and on behalf of) VESSEL OWNER/ MASTER (with Seal)**

\* **“Port Facilities”** mean all facilities, assets, equipment and installations, whether the same are fixed or movable, including, without limitation, the channel, berths, bunkering, loading facilities including buoys or other channel markings.

\* **“Port Services”** mean any service advice, instruction or assistance tendered or provided by the Port Management to Vessel, including, without limitation, by way of pilotage, towage, tug assistance, mooring, berthing, ingress egress or other navigational services.

**ANNEXURE G. SAFETY LETTER**

The Master LNGC: \_\_\_\_\_ Date: \_\_\_\_\_

Dear Sir,

Responsibility for the safe conduct of operations whilst your ship is at this Terminal rests jointly with you, as Master of the ship, and the responsible Terminal representative. We wish, therefore, before operations start, to seek your full co-operation and understanding on the safety requirements set out in the Ship / Shore Safety Check List which are based on safe practices 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 stay at the Terminal and we, for our part, will ensure that our personnel do likewise, and co-operate fully with you in the mutual interest of safe and efficient operations.

Before the start of operations, and from time to time thereafter, for our mutual safety, a member of the Terminal staff, where appropriate together with a responsible officer, will make a routine inspection of your ship to ensure that the questions in the Ship/Shore Safety Checklist can be answered in the affirmative. Where corrective action is needed, we will not agree to operations commencing, or should they have started, we may require them to be stopped until such action is taken.

Similarly, if you consider safety is endangered by any action on the part of our staff or by any equipment under our control you should demand immediate cessation of operations.

**SAFETY IS NON-NEGOTIABLE.**

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

Signed: \_\_\_\_\_  
(Terminal Representative)

Terminal Representative: \_\_\_\_\_

Position: \_\_\_\_\_

Contact Details: \_\_\_\_\_

Signed: \_\_\_\_\_  
(Master)

LNGC: \_\_\_\_\_

Date: \_\_\_\_\_ Time: \_\_\_\_\_

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### ANNEXURE H. SHIP-SHORE SAFETY CHECKLIST

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ISGOTT 6-Ship Shore  
Checklists updated.pdf

## ANNEXURE I. SHIP-SHORE 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 directly connect with the Central Control Building in case of an Emergency.
TERMINAL EPABX	Bi-directional. To Exchange normal information between ship and Main Control Room during Cargo Transfer Operation.
MOORING LINE LOAD DATA	Uni-directional. For the ship to Receive information about the tension of each mooring line.

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

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

E.S.D FROM THE SHIP	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.		
<b>EMERGENCY CONTACTS</b>			
1) Central Control Building 2) Jetty Control Room	<b>VHF</b>		
<b>FOR SHIP (Person in Charge)</b>	<b>FOR TERMINAL (Person in Charge)</b>		
Name	Name		
Position	Position		
Signature	Signature		
Date:	Time:                      hrs.		
<b>Name Of Shift In charge</b>	<b>Contact No.</b>	<b>Shift</b>	<b>Shift Timings</b>

## ANNEXURE J. PRE- CARGO TRANSFER AGREEMENT

Pre-Cargo Transfer Conference Checklist					
<b>Name of the Vessel:</b>			<b>DATE:</b>		
The following checklist needs to be filled by DLTPL representative attending the pre cargo transfer conference on the LNGC ship prior to commencement of cargo transfer. Terminal's tentative cargo transfer plan is to be shared.					
1	LNG to be discharged		5	Average temperature of the cargo	
2	Cargo Tank Pressure		6	Density of the Cargo	
3	Shore Tank Pressure		7	Cargo tank PSV set point	
4	Heel to remain on board		8	Strainer on Liquid lines (Mesh Size)	
9	Average vapour temperature of the cargo				
10	Whether the ship cargo lines have come in cold condition.				Yes/No
11	Temperature of the cargo common discharge header? During cool down of shore arms, ship lines to be maintained in cold condition				
12	Whether the cool down has been limited to the upstream of double shut valve?				Yes/No
13	ESD system used:				Optical/ Electrical
14	Number of main pumps and capacity of each pump				
15	Number of spray pumps and capacity of each pump				
16	Estimated duration for arms cool down				
17	Is vapour return flow measurement possible?				Yes/No
18	Is there any loading port sample available with ship				Yes/No
19	Load port quality certificate is verified, and all components are in agreed range.				



Agreement		Remarks
1	Cool-Down must be done only with the help of spray pumps.	
2	Warm ESD by	Ship/Shore
3	Cold ESD by	Ship/Shore
4	Initial cool down will be done at the flowrate of 10-20 m <sup>3</sup> /hr. The cargo flowrate will be increased only after receiving instructions from the shore. For an efficient arm cool down process, the Terminal requires 200 m <sup>3</sup> /hr – 300 m <sup>3</sup> /hr flow rate of LNG to complete unloading arms cool down in 1 hour 45 minutes approximately.	
5	Ship to ensure equal distribution of flow between all unloading arms. Manifold cooldown valves shall not be fully opened before start spray pump and keep cooldown valves opening as per shore advise.	
6	In case of delay in starting discharge and the arms getting warmer than - 80 °C, cool down will be required again.	
7	Initial discharge to start with one main pump at a rate of 1000 m <sup>3</sup> /hr. Rate to be increased only after instruction from shore.	
8	Ship to inform shore before starting each and every cargo pump.	
9	Ramp up rate should be as advised by shore.	
10	Maximum unloading rate shall not exceed 5000 m <sup>3</sup> /hr per arm.	

Agreement		Remarks
11	Cargo having any restriction in Manifold Pressure for Maximum discharge?	
12	During unloading what is the maximum pressure to be accommodated by cargo tank?	
13	Ship has to keep her vapour return valve fully open. Vapour return valve must not be throttled without shore's permission.	
14	Hourly readings required from ship: Unloading rate, Manifold pressure, Balance quantity on board, Cargo tank pressure, vapour return flow (if possible)	
15	Unloading ramp down to be done by the ship with one-hour notice.	
16	Before ULA's cool down & slow unloading, ship confirmed that ship side ESD system is in line.	
General Information		
1	Ship/Shore Safety check list will be signed by DPCL	
2	Gas burning by ship if any should be done only after information to terminal. It shall be measured and accounted to ship own account.	
3	Post unloading CTMS measurement will be done after the arms are drained and vapour valve is closed.	
4	Pre and Post CTMS measurement will be done at same process condition.	
5	Inform ship if we are going to change over from 100-T-01 to 100-T-02 or vice versa during unloading	
6	Arms connection/disconnection to be done from cubical /remote pendent at shore side.	
7	Arms ERS system: pin position change will be done after unloading arm purging.	
8	Mechanical jacks will be placed before cold ESD.	
9	During cargo flow, no one is allowed on manifold	
10	De-icing of QCDC and DBV flange to be done by fresh/ potable water	

FOR SHIP (Person in Charge)	FOR TERMINAL (Person in Charge)
Name	Name
Position	Position
Signature	Signature
Date:	Time

## ANNEXURE K. INDICATIVE MOORING PATTERN for LNGCs

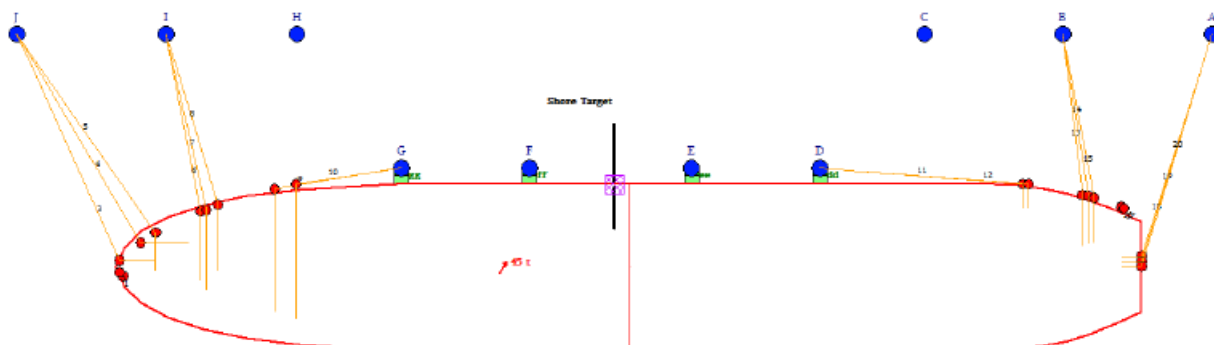


Figure 1: 266,000 m3 LNGC moored Starboard side alongside

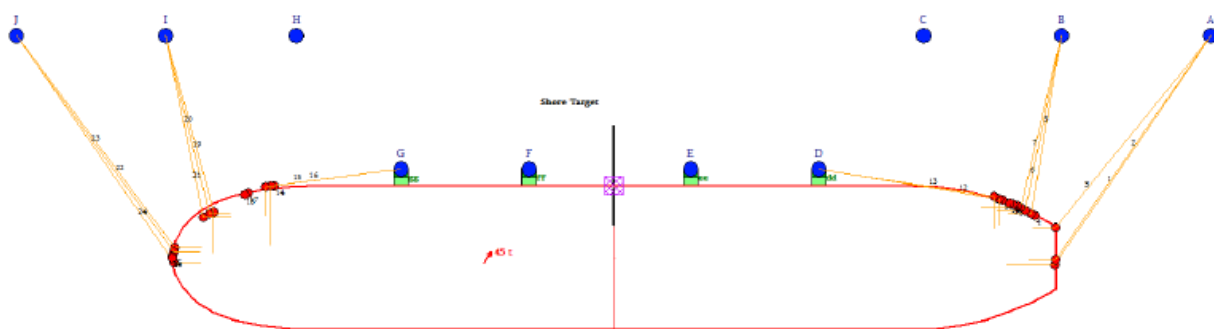


Figure 2: 135,000 m3 LNGC moored Starboard side alongside

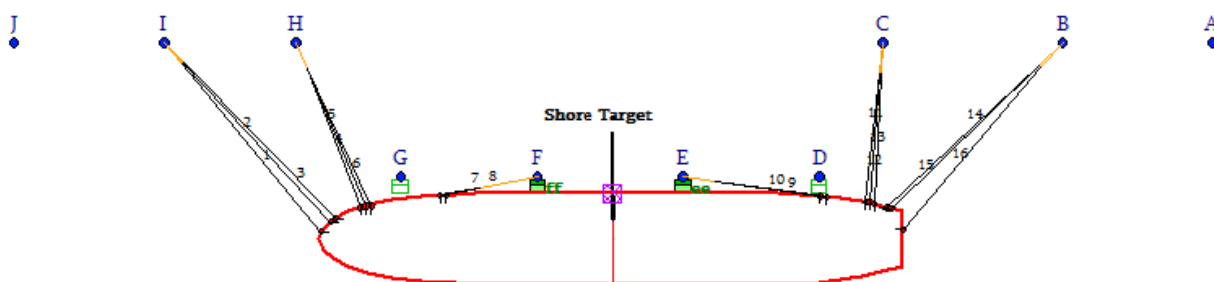
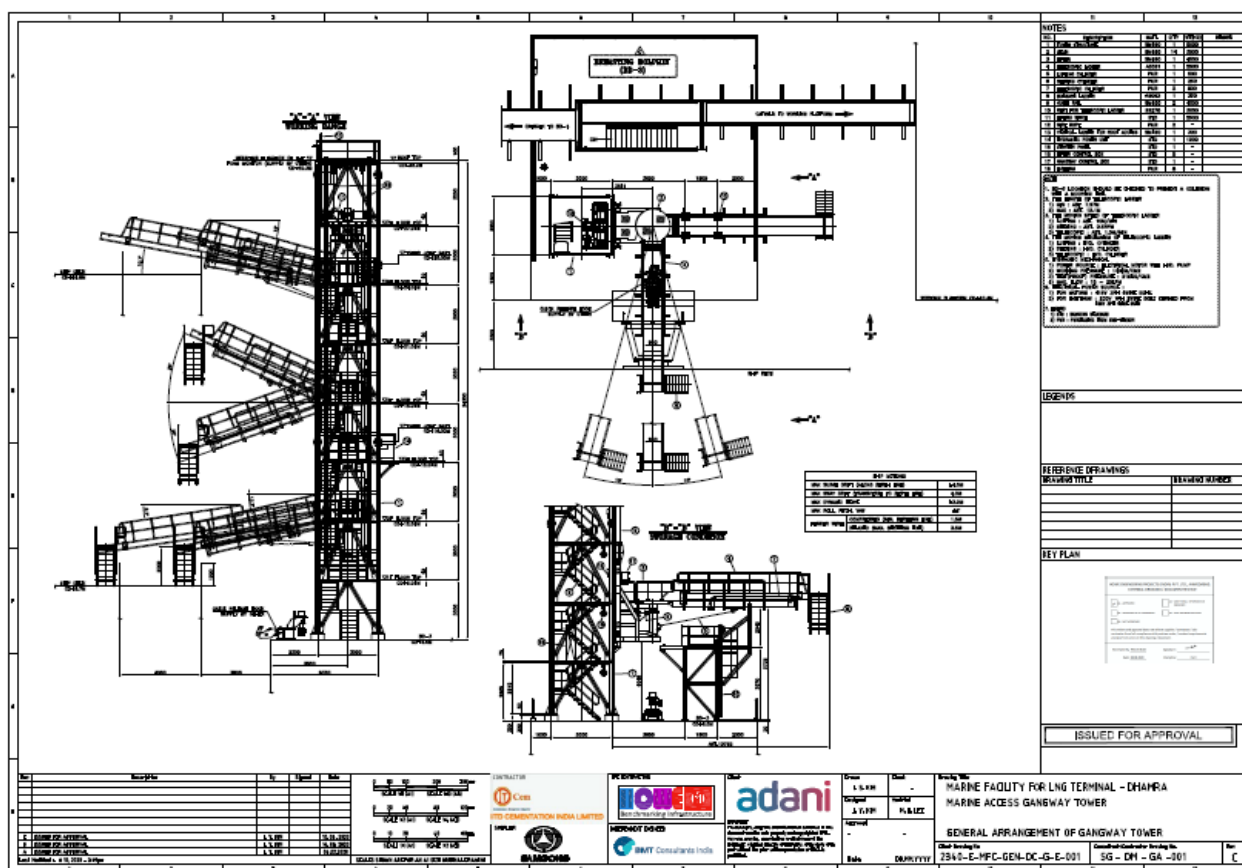


Figure 2: 45,000 m3 LNGC moored Starboard side alongside

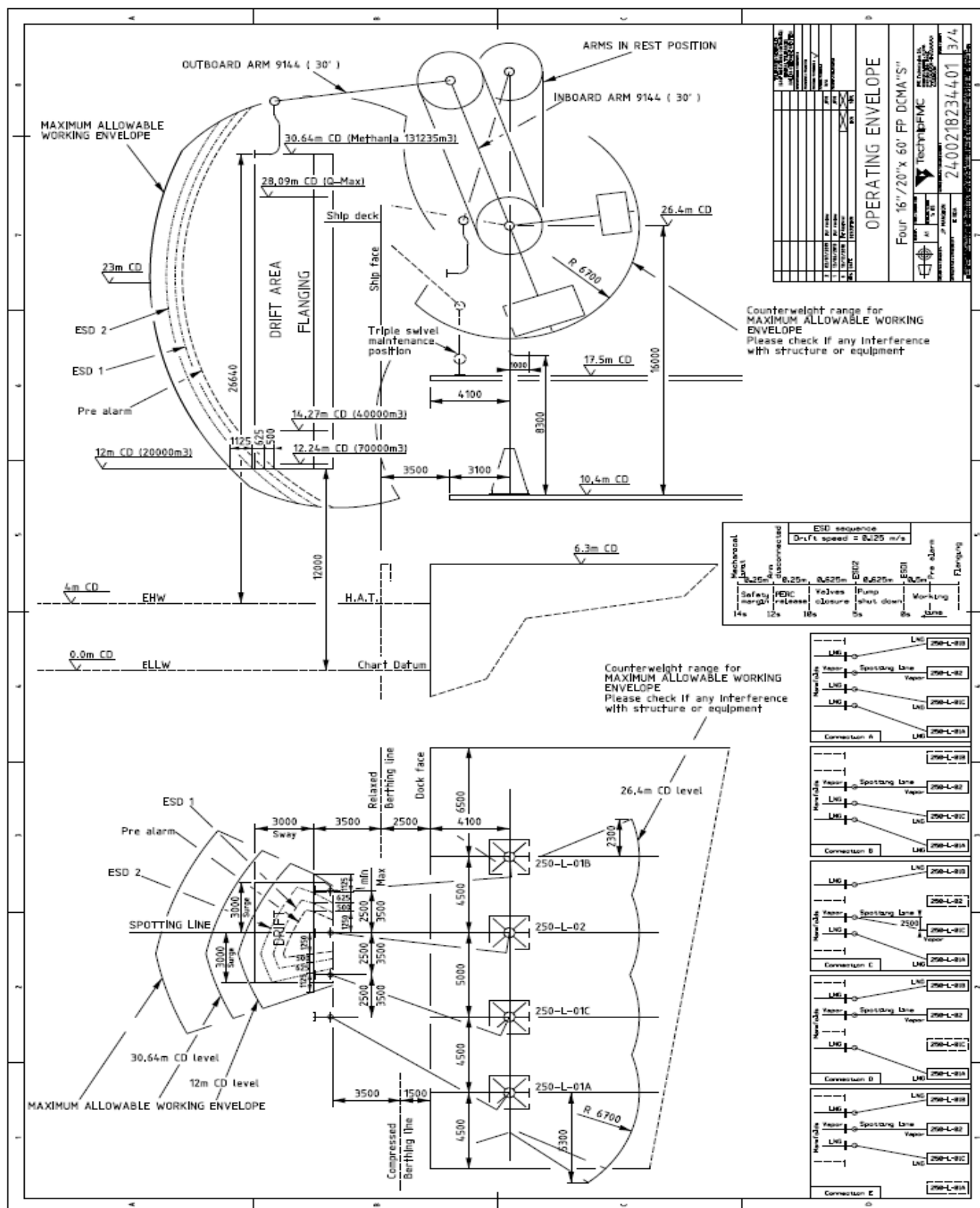
**Exact mooring pattern for each LNGC will be finalized during the Ship to Ship Compatibility study and Approval Process.**

## ANNEXURE L. SHIP - SHORE ACCESS ARRANGEMENT

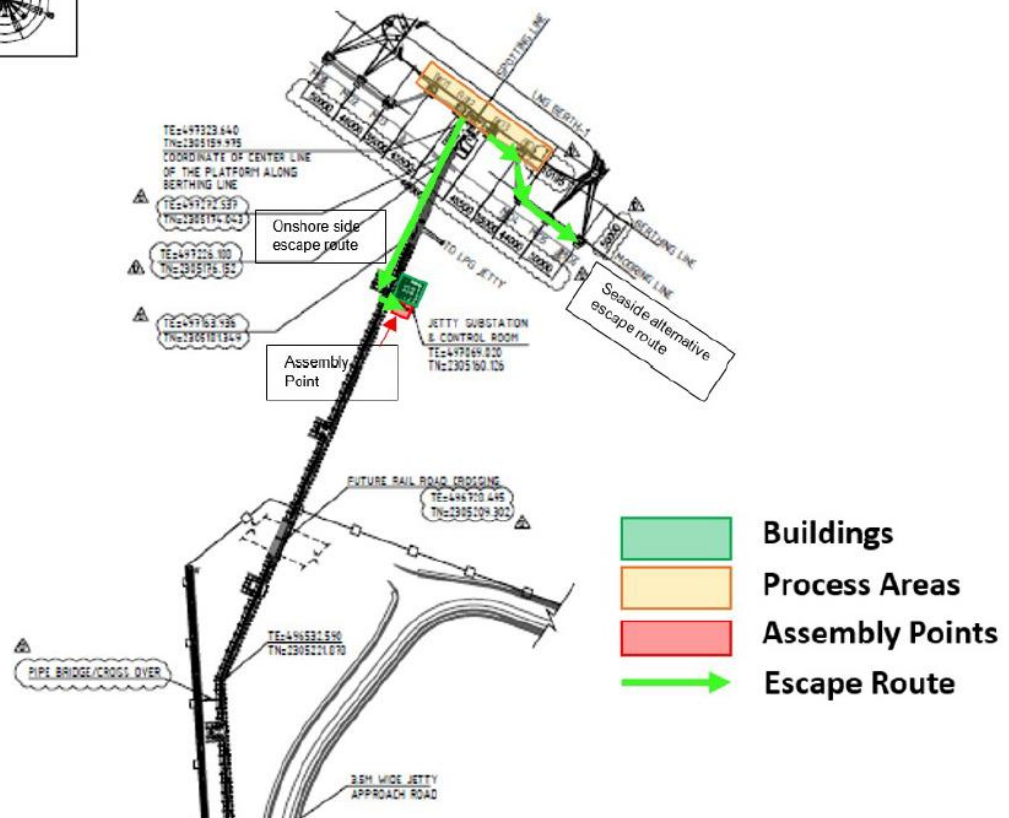
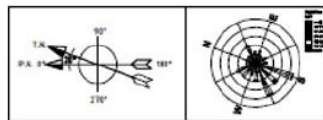


## ANNEXURE M.

## MARINE LOADING ARMS OPERATING ENVELOPE



## ANNEXURE N. ESCAPE ROUTE LAYOUT FOR JETTY



## ANNEXURE O. CONTACT LIST

Sr. No.	Official	Contact Numbers	
		Office	Toll free/Residence
<b><u>Fire Brigade Service</u></b>			
1	Dhamra Port Company Limited	+91-7381251111	
<b><u>Ambulance</u></b>			
1	BLS Ambulance	+91-7381261111	
2	ALS Ambulance	+91-7064460200	
<b><u>Emergency</u></b>			
1	Control Room Collectorate, Bhadrak	06784-251881	
<b><u>Health</u></b>			
1	Port Health Centre	+91-7064460046 06786-270129	
2	Adani Wellness Centre	+91-7064460001	
3	District Civil Hospital, Bhadrak	+91-9439994310	
<b><u>Police</u></b>			
1	Marine Police Station (Dhamra)	06786-222600 +91-9438916380	
2	SP Office Bhadrak	06784-250335	
3	Control Room Toll Free	06784-250007	112
<b><u>Private Hospitals</u></b>			
1	Apollo Hospital, Bhubaneswar	0674-6661066	
2	Ashwini Hospital, Cuttack	0671-2363007	

### DPCL Contact List

Name	Designation	Telephone/ Mobile	E-Mail
Mr. Devendra Thakar	CEO	06786-270111	devendra.thakar@adani.com
Mr. Sanjeev Kumar Gupta	COO	06786-270112	sanjeevkumar.gupta1@adani.com
Capt. Ajit N Mahapatra	Head Marine & PFSO	06786-270158	ajitnarayan.mahapatra@adani.com
Mr. Shiba Nanda Hota	Head Security	06786-270146	shibananda.hota@adani.com
Port Signal Station (PSS)	Duty Radio Officer	06786-270258 +91-7894400376	marineops@adani.com

### DLTPL Contact List

Name	Designation	Telephone/ Mobile	E-Mail
Mr. Pradeep Kumar Bansal	Terminal Manager /COO	+91 9925170428	Pradeepkumar.bansal@adani-total.in
Mr. Kumar Anand	Head Marine	+91 8093590722	Kumar.anand@adani-total.in
Mr. Shubham Kumar	Lead- Marine	+91 9937251522	Shubham.kumar@adani-total.in
Jetty Control Room (JCR)	Radio Officer	+91 7077772713	N.A
Central Control Building (CCB)	Shift Superintendent	+91 7749846555	N.A