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AIMS
ADRIATIC LNG INTEGRITY MANAGEMENT SYSTEM

Adriatic LNG
Energy for a better future

Marine operations manual



Terminale GNL Adriatico S.r.l.

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1 INTRODUCTION

1.1 Scope

The **Marine Operations Manual (MOM)** provides a description about Terminale Gnl Adriatico Srl (also known by the name ALNG or Adriatic LNG Terminal) Marine activities. These, as well as all other activities, are subject to the procedures and processes as described in Safety, Security, Health and Environmental Management System (AIMS). AIMS principles should be observed in the MOM's implementation and stewardship.

This document serves the vessels involved in the activities at the Adriatic LNG Terminal and has the primary purpose of providing clear guidance on the operations that concern them during activities at the Adriatic LNG Terminal.

1.2 Using this document

The MOM is intended to assist, but not limited to, organizations in:

- Daily operations and conducting the safe and efficient marine activities of vessels and boats.
- Liquefied Natural Gas Carrier (LNGc) unloading operations.

1.3 List of Abbreviations

ALNG	Terminale GNL Adriatico SRL, the Terminal operating company
Cargo equipment	Cargo pumps, cargo compressors, cargo vaporizers, inert gas generators, motors, control equipment, and other cargo-handling equipment (e.g. reliq. Plant, GCU). It also includes, where appropriate, primary and emergency power supply, circulating pumps and other auxiliary equipment essential for safe and efficient operations.
Crew	Collectively the personnel involved with cargo-handling operations, and all other people related to these operations on behalf of the LNG Carriers.
Government entity	Any legislative, judicial, regulatory or executive body (including any agency, bureau, department, commission or office) of the government of any sovereign state or any political subdivision thereof – including the Maritime Authority – or the institutions of the European Union including the European Commission.
Intrinsically safe	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 an appropriate body as "intrinsically safe".
Harbour master	Authority Responsible of the Port, person in charge of issuing the Ordinance for Port regulation related to Navigation, Safety, Security, Environment Emergency and Port Service. The Harbour Master plays a pivotal role in maintaining the

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	integrity and functionality of the port, ensuring that all operations adhere to the highest standards of safety, security, and environmental protection.
Laws	All applicable laws, treaties, conventions, statutes, rules, regulations, decrees, ordinances, licenses, permit compliance requirements, decisions, orders, directives and policies that are enforceable through regulatory and/or judicial process of any Government Entity.
Line handlers	The group of persons designed by the Maritime Authority to assist the vessel during the mooring and unmooring operation.
LNG	Liquefied Natural Gas
LNG carrier	Liquefied natural gas carrier, 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.
LNG carrier owner	A vessel's owner is an individual, company, or legal entity that holds the title to a ship, controls its operation, or receives the financial benefits of the marine craft.
LNG carrier type	LNG Conventional gas carrier with capacity up to 160000CM. Other LNG Carrier gas carrier with capacity more than 160000CM.
Maritime safety regulations	Local regulation edited by Chioggia Harbour Master and updated in regular basis
Master	When used in relation to an LNG Carrier, any person having the command of the LNG Carrier, or 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 compliance with the Terminal Regulation
Naked lights	Open flames, exposed incandescent material or any other unconfined source of ignition.
Maritime authority	Coast Guard / Harbour Master, in his capacity as the party entrusted with the administration and enforcement of the applicable Maritime Safety Regulations.
Notice of readiness	Meaning specified in article VIII. Operational information .3 Notice of Readiness
Offshore installation manager	The person in charge of the safe operation of the Terminal.
Oil Companies International	It is a voluntary association of oil companies with an interest in the shipment and terminalling of crude oil, oil products, petrochemicals and gas.

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Marine Forum (OCIMF)	
Person	Any natural person, corporation, company, partnership (general or limited), limited liability company, business trust, Government Entity or other entity or association.
Pilot and pilotage	The persons designed by the Maritime Authority to assist the Master during the arrival and departure operation from berths
Ship's agent	The agent appointed by the LNG Carrier Owner or Charterers to act on behalf of the LNG Carrier in arranging Marine services and Government Entity clearance requirements for the LNG Carrier to offload at the Terminal and other obligations to be carried out by such agent on behalf of the LNG Carrier pursuant to these Terminal Regulations
Ship/shore compatibility study (SSCS)	The risk analysis evaluation carried before the arrival of LNGc related to the technical compatibility between LNGc and Terminal.
Society of International Gas Tanker and Terminal Operators (SIGTTO)	An international organization that focuses on the safety and operational reliability of gas tankers and gas terminals.
Terminal	The LNG receiving facility, geographically located at the coordinates provided, including berth area and other facilities within the 2000m exclusion zone.
Terminal regulations	Refers to this "Terminal Information Booklet", which serves as the agreement applicable to all LNG Carriers and individuals operating at the Terminal berth
Terminal representative	The designated person who will board the LNG Carrier on behalf of ALNG and will act as co-coordinator between ALNG and LNG Carrier. The Terminal Representative or 'Loading Master' is in direct communication with the Terminal Control room
Third party	Any Person not a party to this agreement.
TUG	The boat designed by the Maritime Authority to assist the Master during the arrival and departure operation from berths
Unloading - discharging	The technical operations (following the mooring of an LNG Carrier at the Terminal and the safe setting of the receiving equipment) used to transfer the LNG in accordance with the ALNG procedures, OCIMF/SIGITTO guidelines.

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2 TERMINAL LOCATION AND OVERWIEW

2.1 Terminal location

The Terminal of "TERMINALE GNL ADRIATICO s.r.l." is a storage and regasification plant for liquefied natural gas (LNG) and consists of a fixed concrete structure (GBS), oriented in an East/West direction.

The Terminal is located approximately 10 nautical miles ENE of Porto Levante.

The coordinates of the Terminal and Anchorage area are:

Terminal:	Lat. 45° 05'.3N – Long 012° 35'.1 E
Anchorage Area (CST): Chioggia Tanker Anchorage is a Regulated Squared area identified by Chioggia Coast Guard in following position:	A) Lat. 45°10'.20N - Long. 012°25'.00E
	B) Lat. 45°10'.20N - Long. 012°26'.18E;
	C) Lat. 45°09'.28N - Long. 012°25'.00E;
	D) Lat. 45°09'.28N - Long. 012°26'.18E.

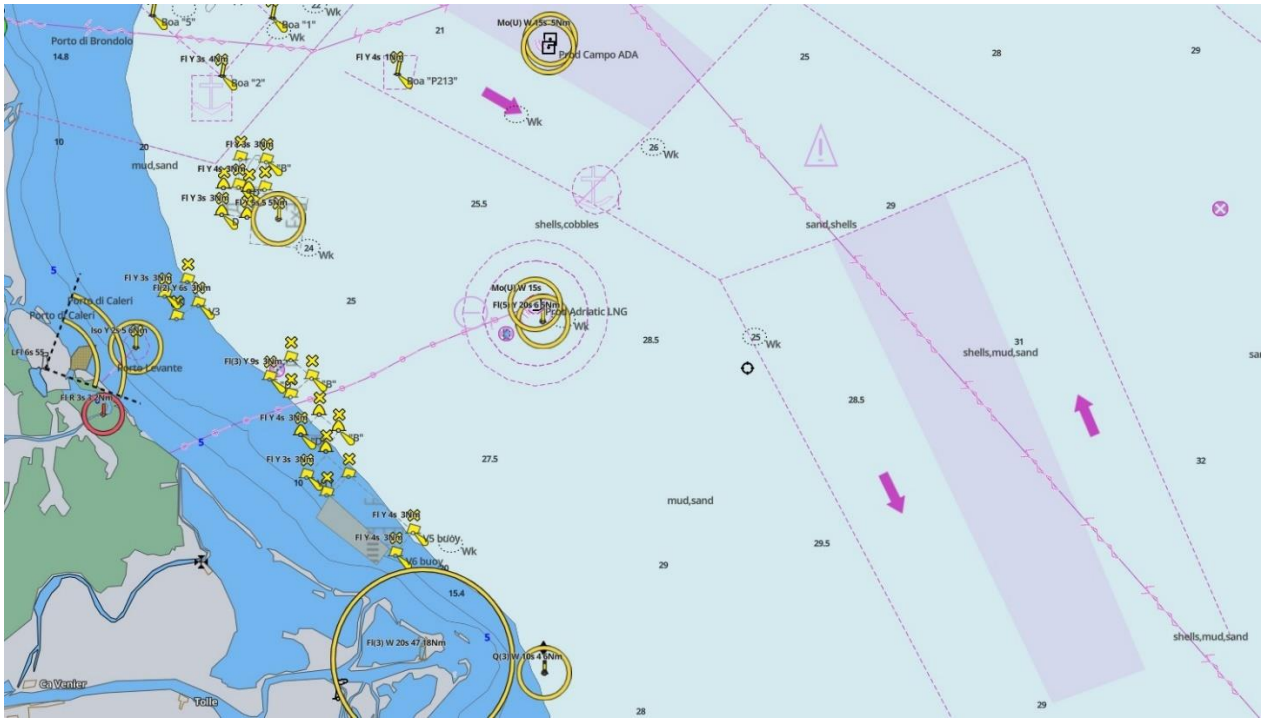


Fig 1 - Terminale GNL Adriatico, particular of North Adriatic Vessel Traffic Separation Scheme

LNG Carriers requiring anchoring must need and receive authorization from Maritime Authority on VHF channel 14.

Restricted areas and Safety Zones

A 2000-mtrs or 1,1 Nm radius Safety zone exists around the Terminal in which navigation and fishing activities are prohibited.

Access to the exclusion zones is restricted exclusively to LNG Carriers calling at the Terminal, mooring support vessels and support service vessels, either working for or authorized by ALNG and Marine Authority, as well as those vessels associated with law enforcement agencies.

There is also a 1.5 Nm radius Area to be Avoided (ATBA) / No anchoring area around the Terminal.

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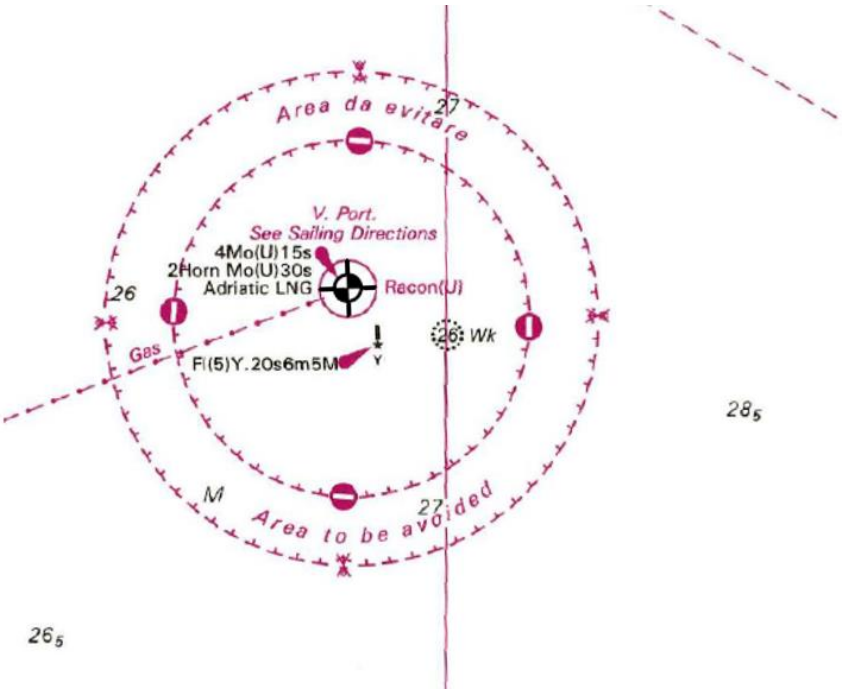


Fig 2 - Restricted Area – Safety Zone

2.2 Terminal layout

Terminal measuring approximately 180 meters in length and 90 meters in width and containing two LNG storage tanks of 125,000 m3 each in volume and other equipment located on the upper deck.

Two separate mooring structures, connected to the terminal by two walkways, are located at the eastern and western ends of the concrete base, making the total length of the structure 385 meters. Mooring posts on the northern part of the platform allow LNG vessels to be moored at the Terminal for unloading operations.

Two buoys have been positioned SSE and NNE of the Terminal at the following coordinates:

Northen Buoy

Lat 45°06.302 N



Long 012°35.291 E

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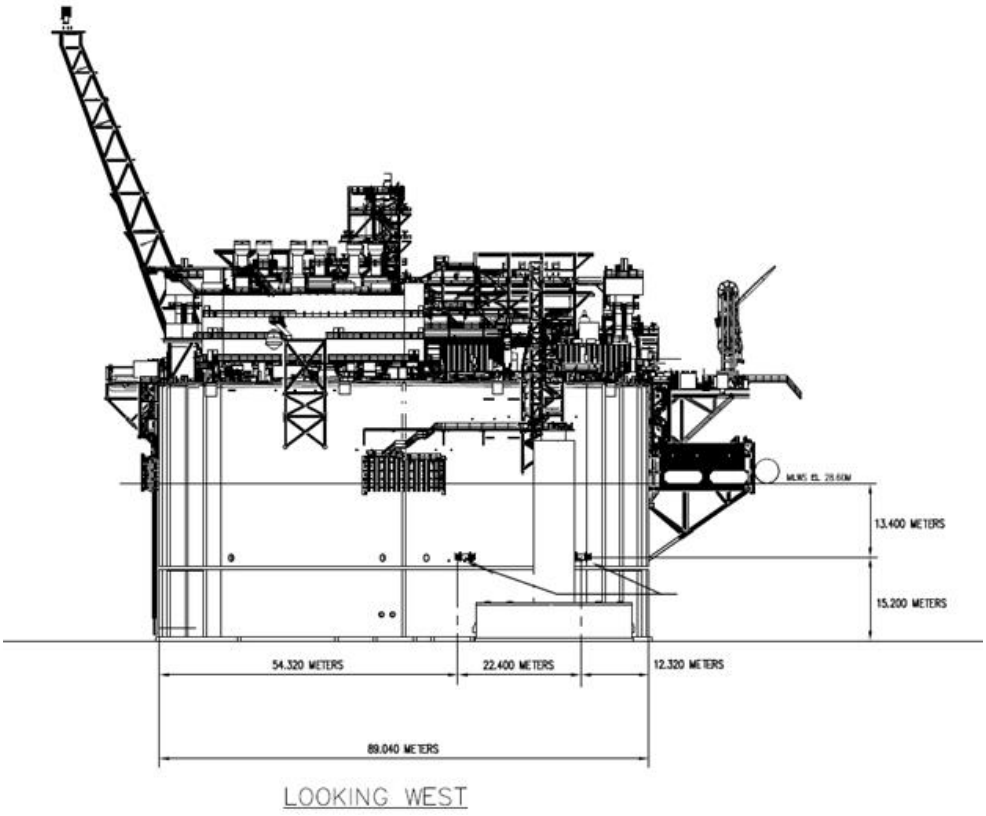
Southern Buoy

Lat 45°05.132 N

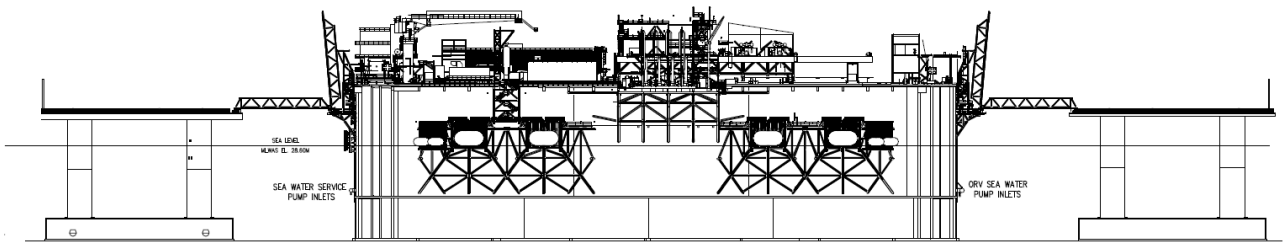


Long 012°35.326 E

Range: 3 NM
Visibility: 360°
Color: Yellow
Height above sea level: 2.5 m



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LOOKING SOUTH



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3 ACCEPTANCE PROCEDURE

Any vessel approaching the ALNG terminal, excluding those engaged in public port services and craft operated by the competent authorities, is subject to an approval process by the Adriatic LNG Marine Department.

Particular attention is given to vessels supporting logistics services, which follow a dedicated procedure for assignment and authorization.

LNG carriers, in accordance with internal procedures, undergo a specific acceptance process aimed at verifying both dimensional compatibility and qualitative standards (see attachment 2 “LNGC Acceptance Criteria – Vetting Procedure Guide,”).

The main evaluation criteria include, but is not limited to:

- SSCS criteria, that include dimensional compatibility for Fenders, Manifold/Cargo Loading Arms, Mooring, Gangway, Emergency Shutdown System (ESD);
- Vessel’s inspection performance;
- Vessel’s history information.

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4 WEATHER LIMIT INFORMATION

Weather requirements are established by Coastguard Ordinance.

Reference values are listed below.

Q-Flex, Large Conventional & Moss

Activity	Direction	Wind (at 10m)	Significant wave height (m)
Berthing	North	20 Knots	1,5 meters
	South	20 Knots	1,5 meters
Unberthing	North	20 Knots	1,5 meters
	South	20 Knots	1,5 meters

Conventional LNGc

Activity	Direction	Wind (at 10m)	Significant wave height (m)
Berthing	North	25 Knots	1,5 meters
	South	25 Knots	1,5 meters
Unberthing	North	25 Knots	1,5 meters
	South	25 Knots	1,5 meters

Note for all LNGc

- Mooring and unmooring operation allowed 24 hr/day.
- The visibility for berthing operations shall be more than 500m.
- Terminal is fitted with anemometer and wave measurement equipment that will be used to determine the prevailing wind and sea state conditions.
- Current not greater than 1 Knot intensity.

Reduced visibility

When visibility at the Terminal falls below 100 meters as determined by observation of a known fixed distance, the Terminal Offshore Installation Manager (OIM) and Master will jointly review the situation to manage unloading and provide appropriate safety measures. This may include but is not limited to:

- Placing tugs at closer stand-by;
- Additional deck and berth personnel for monitoring purposes.

Permanence at Terminal

Permanence at Terminal shall be in compliance with the following maximum reference limits, without prejudice to the responsibility of the ship's Master to make different choices, after consulting the OIM and Pilot.

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Activity	Height of the Significant wave	Direction of the wave
Limits upon reaching which the unloading operation must be interrupted and the loading arms disconnected	1.5 m	From 110 to 190 degrees
	1.7 m	From 300 to 060 and from 190 to 240 degrees
	2.0 m	From 060 to 110 and from 240 to 300 degrees
Limits upon reaching which the vessel must be unmoored	1.7 m	From 110 to 190 degrees
	2.0 m	From 300 to 060 and from 190 to 240 degrees
	2,5 m	From 060 to 110 and from 240 to 300 degrees

Activity	Wind Speed (at 10m)	Duration / Direction of the wind
Limits upon reaching which the unloading operation must be interrupted and the loading arms disconnected	28 knots	1 hr from each direction
	34 knots	30 sec burst from any direction
Limits upon reaching which the vessel must be unmoored	30knots	1 hr from each direction
	36 knots	30 sec burst from any direction

ALNG is not liable under any circumstances towards the LNG Carrier and/or Third Parties for the use of the information provided.

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5 GUIDELINE TO THE MOORING / APPROACH OPERATION TO THE ALNG TERMINAL

5.1 North mooring for LNG Carrier

Approach to the terminal

Involved Person	Description
At Pilot Boarding time (POB)	
Pilot	Embark on LNG Carrier in Anchorage Area CST (Chioggia Small Tanker). It assists the Ship's Master in communications with the Operative Station of the Chioggia Harbour Master's Office (VHF Ch. 16) and with the Terminal (VHF Ch. 8) giving the P.O.B. time and confirming the start of the manoeuvre. On VHF Ch. 14, it performs a radio check with the mooring teams and the four tugboats.
Terminal Representative	Loading Master or OIM, confirm Terminal readiness to receive the LNG Carrier for the unloading operation
At, about, 3 nm from terminal	
Tug and Vessel	Vessel's crew in conjunction with the tug's crew start the operation for fast the 4 tugs to the LNG Carrier.
Line Handler	Guarantee the approach to the terminal with 2 service boat. 4 Line Handler embark to the ALNG terminal from Boat landing or other agreed position. Participate to the toolbox meeting before start operation with the Loading Master or other ALNG Terminal representative.
LNG C / Terminal Rep.	With the assistance of Pilot, LNG Carrier confirms their approach to the terminal, on VHF Ch 08, at the following distance ▪ 3 nm ▪ 2 nm ▪ 1 nm Terminal confirm the information.
At, about, 500m from terminal	
LNG C / Terminal	With the assistance of Pilot, LNG Carrier confirms their approach to the terminal, on VHF Ch 08, and the starting of last sequence before starting mooring.
Line Handler	Confirms readiness for start mooring operation to the vessel and terminal representative.
Terminal Representative	Confirms readiness for the mooring operation, and when the vessel distance is about 300m the approaching panels with information related angle, speed and distance is activated.
LNG C / Terminal Rep. / Line Handler	When LNG C. is at, about, 100m from terminal, the mooring operation started with the spring line (forward and Aft) were taken from Line Handler boat.
Line Handler	Line Handler following the LNG C. Master's instruction given through Pilot, start the Mooring as per agreed mooring plan.
Tug	Tug Master following the LNG C. Master's instruction given through Pilot, assist the vessel to the mooring position.
Terminal Representative	Verify the correct position of the LNG C. for the following connection of loading Arms.

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During Berthing

Involved Person	Description
LNG C	Master shall ensure of: ▪ Vessel must be ready to left the terminal as per agreed information reported on Ship/Shore Safety Check List; ▪ Adequate lighting on all operation areas; ▪ All security duty and task were followed by crew; ▪ All information poster (Safety and Security) is well placed on dedicated areas; ▪ Weather condition is monitored continuously.
Terminal Representative	OIM, or it is delegated, shall ensure that: ▪ Weather condition is monitored continuously, and shared with LNG C. and Loading Master; ▪ Personnel adequately trained for Cargo Operation is present on board, which must be kept continuously in touch with LNG C. and Loading Master
LNG C / Terminal	During the ship's stay at the Terminal, appropriate supervision of the mooring quality must always be ensured. Terminal personnel and Line Handlers must regularly check the mooring lines and immediately communicate with the ship's Master and the Pilot for any necessary actions. During the port stay period the mooring the correct working tension of mooring ropes were monitored thorough the "Rope's tension monitor", placed on Terminal and on board of LNG C.
LNG C / Pilot	As per Local Regulation Pilot remain as guest on board of LNG Carrier for whole operation. During this period, remain in touch with Master, Loading Master, Line Handler and Tug's Master. Check the weather condition and, if requested, suggest action to the Master or OIM.
Tugs	As per Local Regulation, completed the mooring operation, all 4 Tugs remain in the area in proximity of Terminal / LNGC: ▪ 2 Tugs in a range of 10 minutes of approach; ▪ 2 Tugs in a range of 30 minutes of approach. ▪ Reference also available in the Terminal Booklet
Loading Master	Remain as guest on board of LNG Carrier for whole operation, supervising the conduct of discharging and maintaining a contact with Terminal and LNG Carrier CCR.
Line Handler	As per Local Regulation, number two L.H. remain as guest on board of ALNG Terminal for whole operation, in touch with Terminal and LNG Carrier CCR, Pilot and Loading Master. Ensure that the mooring line working properly during the operation.

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Unberthing Operation

Involved Person	Description
LNG C / Pilot	With adequate notice prior to the completion of commercial operations, and in any case no less than three hours in advance, the Master, through the Loading Master, shall inform the Pilot of the expected unberthing time. The Pilot shall then notify all relevant parties of the sequence of operations to be carried out.
Terminal Representative	Before unberthing manoeuvres begin, the OIM ensures that all equipment between the Terminal and the LNG carrier has been disconnected and that the gangway has been removed. The OIM then receives confirmation from the Line Handler that they are in position and ready, and communicates this information to the LNG C Master and the Pilot, confirming readiness for the unberthing operations.
Line Handler	Guarantee the approach to the terminal, with at least one boat, one hour before the agreed time. 2 Line Handler embark to the ALNG terminal from Boat landing or other agreed position, and together with the 2 remain on terminal take the position for unmooring. Participate to the toolbox meeting before start operation with the Loading Master or other ALNG Terminal representative. Once the operations are completed, they report any equipment malfunctions or anomalies to the Terminal Control Room and to the Loading Master.
Tug	As established by the Master and communicated through the Pilot, they turn the lines in accordance with the received instructions and carry out the orders for the unberthing manoeuvring.
LNG C / Pilot	The vessel is moved away from the berth with the assistance of the tugboats and with engines on standby. The manoeuvre proceeds with optimal heading and speed until the point where it is safe to release the tugboats and reach the position identified by the Pilot as safe for disembarkation outside the safety zone.

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5.2 Mooring structures protection Fender

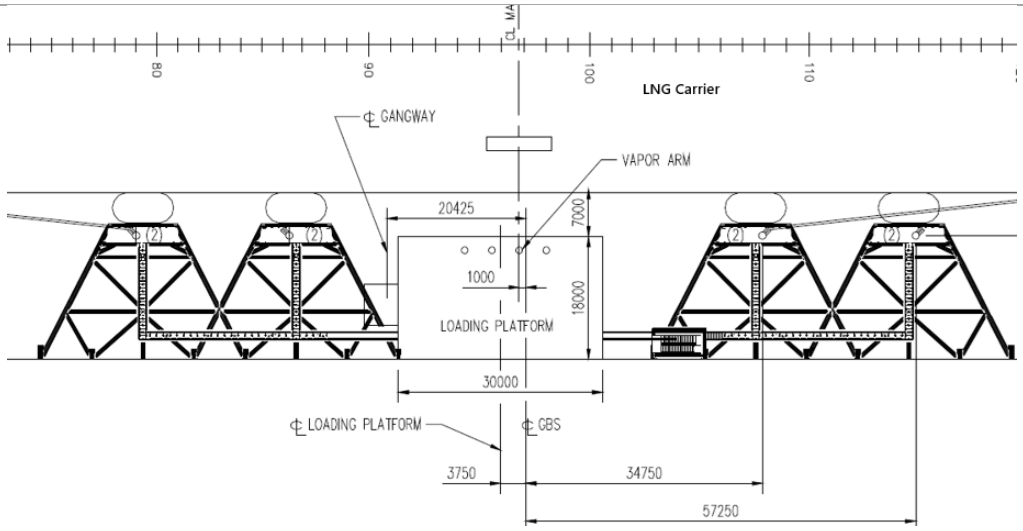
ADRIATIC LNG TERMINAL YOKOHAMA FENDER'S SPECIFICATION

Make Model: Yokohama Pneumatic Floating Type 50, 4.5m D x 9m L

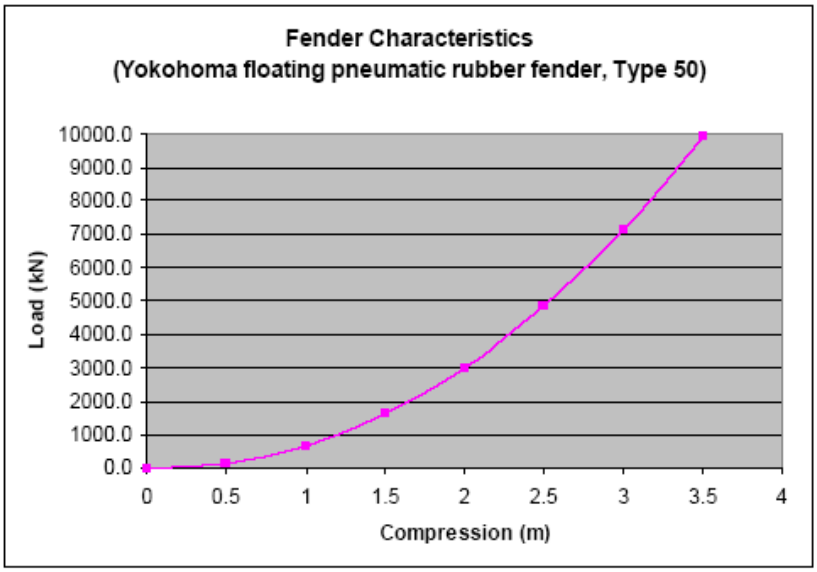
Nominal Size Diameter x Length (mm x mm)	Initial Internal Pressure (kPa)	Guaranteed Energy Absorption (GEA) (kNm)	Reaction Force at GEA (kN)	Hull Pressure at GEA (kPa)	Safety Valve Setting (kPa)	Testing Pressure (kPa)
4500 x 9000	**50**	**4752**	**5747**	**146**	**175**	**250**

Arrangement

inner fenders at 35.75m and outer fenders at 58.25m from global coordinates with vapour arm 1m to west of global axis



Deflection curve



The theoretical compression characteristic of individual fender given below (Yokohama floating pneumatic rubber fender, type 50, 4.5m Ø x 9m log, and 50kPa pressure rating) was provided by Yokohama. Regression fit to the data produced the following regression equation:

$L_{(X)}$ [kN] =679*$x^{2.14}$

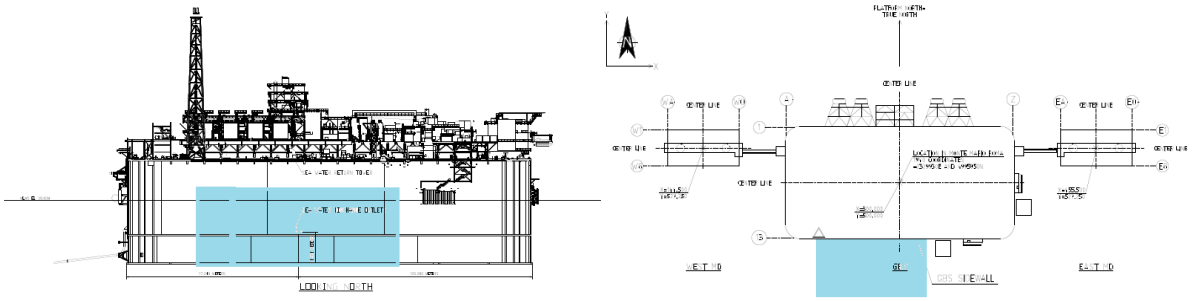
Where **x** is fender compression in meter

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5.3 Approach to the South Area (Personnel and equipment boarding area)

- Notify the CCR on VHF channel 8 when approaching the ATBA
- Inform the terminal representative for the coordination of activities alongside
- Approach at slow speed toward the South Boat Landing
- Begin personnel and equipment boarding/disembarkation
- Move away from the area at slow speed

Note for the manoeuvring of approach in the southern area



Area of Turbulence

In the approach area to the South boarding point, there is turbulence caused by the seawater discharge flow from the terminal's systems.

Approach of other kinds of vessels is assessed and managed according to the activities to be carried out.

Mooring personnel arriving to assist with LNG carrier berthing operations normally approach the Terminal using their own boats and may board the facility independently from either the East side or the South side, subject to prior notification to the ATBA entrance.

In cases where sea conditions or wave action could compromise the safety of their transfer to the Terminal, ALNG provides transportation by means of the CSV, embarking the mooring personnel from the Shore Base.

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6 TERMINAL AND VESSEL ACCESS

Access to the terminal is always subject to a prior safety and security check.

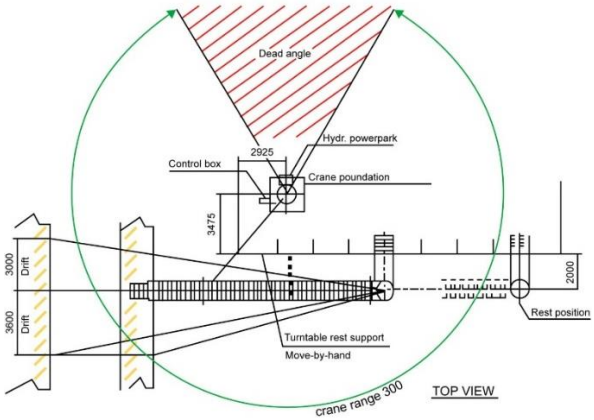
All access points are authorized and continuously monitored.

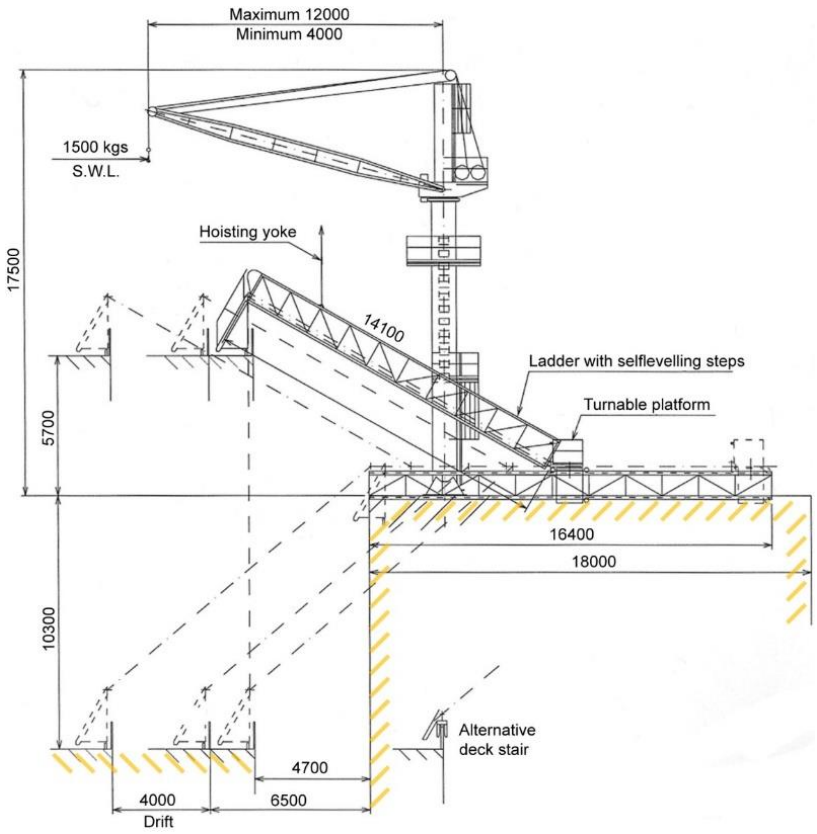
Access is permitted only by sea and exclusively via a vessel designated for this service, or, when necessary, from the berthed ship.

Accesses to the terminal

GANGWAY NORD

- Max range 12.0 m.
- SWL 1500 Kg.
- Slewing range 300 degrees.

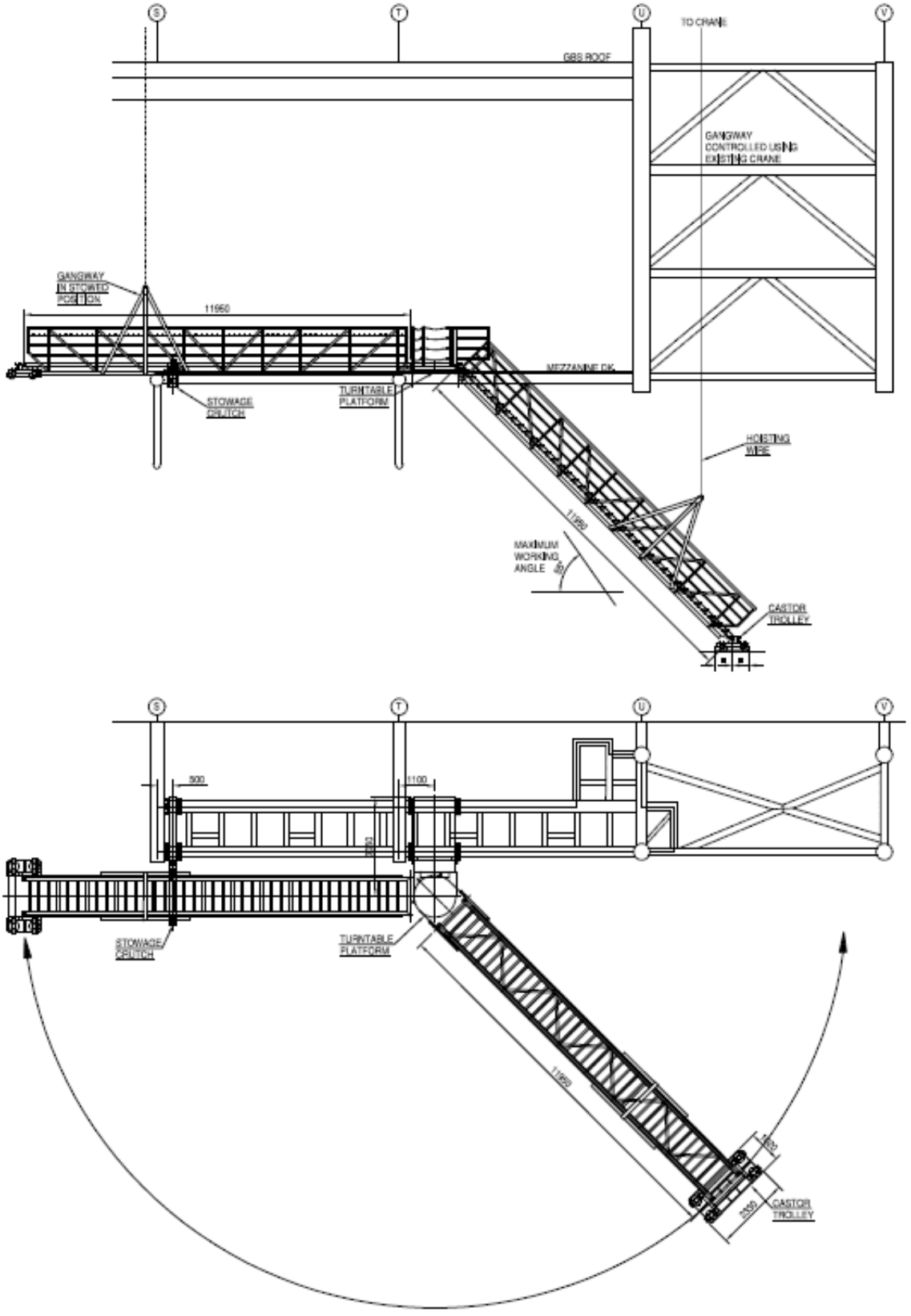




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GANGWAY SUD:

- SWL 2925 Kg.
- Range 12.0 m.
- Slewing range (as perpendicular as possible).



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FROG

Model No.		XT6
Dimensions (Nominal)		
Width 1		2110 mm
Width 2 (Across Buoyancy)		2660 mm
Height		2180 mm
Weight		
Maximum Gross Mass		1200 kg
Tare Weight		540 kg
Payload - SWL		660 kg
Number of Passengers		
Standard		6
Stretcher Mode		1 + stretcher
Type Approval	Class	EC Type examination certificate No. MAC000005 i01
Quality	System	Manufactured to ISO 9001:2008
Standards	National Technical Standards	UK, BS EN 1993 series: 'The Use of Structural Steel in Building'
	Industry European Standards	EC Machinery Directive - EN 14121-1, BS EN 12100-10
		Load Test – ILO152 / LOLER



Parameter	Recommendation
Wind Speed	40 knot / 20 m/s (The Frog-XT is very stable in high winds. However crane limits must be observed)
Vessel Motion	Pitch 10º Roll 10º
Vessel Station-Keeping	Able to maintain position within a 5 m (16 ft) radius. If a high risk of the vessel losing position exists, disconnect the carrier for passenger embarkation.
Landing Area on Vessel	6 m x 6 m (20 ft x 20 ft) landing area is recommended, equivalent to 2m (6.5 ft) clearance all round. Smaller landing areas may be used provided a risk assessment of factors such as deck hazards, weather, sea state, vessel size, station-keeping is carried out.
Landing Area on Installation	4 m x 4 m (13 ft x 13 ft) clear landing area is recommended based on additional 1m entry and exit path on all sides.

Line Handler / port services access

To guarantee the access to terminal a fixed marine ladder was placed on boat landing area.

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7 Crew Supply Vessel (CSV)

- **Purpose**

The Crew Supply Vessel (CSV) is the primary marine logistics asset used by Adriatic LNG to ensure the safe and continuous transportation of personnel, equipment, materials, consumables, and waste between the Shore Base and the Offshore Terminal. The vessel also provides emergency response capabilities and operational support for maintenance, environmental monitoring, marine operations, and LNG carrier support activities.

- **Area of Operations**

The CSV normally operates between the Adriatic LNG Shore Base located in Porto Viro and the Offshore LNG Terminal located approximately 17 km offshore in the North Adriatic Sea. Alternative embarkation or disembarkation locations may be designated by Adriatic LNG when operationally required.

All vessel movements shall comply with applicable Harbour Master's Ordinances, Terminal Marine Procedures, and instructions issued by the Terminal Central Control Room (CCR).

- **Primary Functions**

The CSV shall perform the following services:

- Transportation of personnel to and from the Terminal.
- Transportation of operational materials, spare parts, consumables and equipment.
- Transportation of food supplies, including dry and refrigerated stores.
- Transportation of dangerous goods and hazardous materials in accordance with applicable regulations and vessel certifications.
- Transfer of diesel fuel, potable water between shore and offshore facilities.
- Transportation of hazardous and non-hazardous waste generated at the Terminal.
- Support to environmental monitoring and environmental compliance activities.
- Support to maintenance campaigns, including fender replacement activities and offshore construction works.
- Support to emergency response activities, including Medical Evacuation (MedEvac), Casualty Evacuation (CasEvac), Man Overboard response and emergency drills.
- Transfer of personnel, equipment and limited supplies to LNG carriers when authorized by Adriatic LNG.

- **Personnel Transfer Operations**

Personnel transfer shall normally be conducted through the South Boat Landing using the Terminal gangway positioned by the Terminal crane.

When vessel motions or environmental conditions prevent the safe use of the gangway, personnel transfer may be conducted using the FROG Personnel Transfer System in accordance with the applicable Marine Procedures and risk assessment requirements.

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Alternative transfer arrangements may be established through the North Crane when the South Boat Landing is unavailable or unsuitable for operational use.

The Vessel Master retains overall responsibility for determining whether transfer operations can be executed safely considering:

- Sea state.
- Wind conditions.
- Visibility.
- Vessel motions.
- Terminal operating conditions.
- Any other factor affecting personnel safety.

- **Cargo and Material Transfer Operations**

The CSV is designed and equipped to transport deck cargo, containers, tools, spare parts and project materials required for Terminal activities.

Materials shall normally be transported in certified offshore cargo containers. Non-containerized cargo may only be carried following authorization from the Vessel Master and verification that appropriate securing arrangements are in place.

The vessel may also support:

- Loading and unloading operations at the South Boat Landing.
- Loading and unloading operations at the North Crane area.
- Fender replacement campaigns.
- Offshore maintenance projects.
- Temporary transfer of equipment to LNG carriers.

Material transfer operations on the north side of the Terminal may only be carried out when the applicable terminal configuration permits safe vessel access, including the removal of Fender Tether No. 8 when required.

- **Bulk Transfer Operations**

The CSV is equipped to perform transfer operations involving:

- Diesel fuel.
- Potable water.
- Sewage (black water).

Transfer hoses shall be handled using the Terminal equipment and connected by qualified vessel personnel in accordance with approved operating procedures.

All transfer operations shall be performed under controlled conditions and in compliance with environmental, marine safety and pollution prevention requirements.

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- **Waste Management Services**

The CSV is the designated means for transporting waste generated by Terminal operations to shore disposal facilities.

Waste transportation shall be performed in accordance with:

- Applicable Italian environmental legislation.
- MARPOL requirements.
- Waste tracking and traceability requirements.
- Adriatic LNG Waste Management Procedures.

The Vessel Owner shall maintain all permits, registrations and authorizations required for the transportation of hazardous and non-hazardous waste.

- **Environmental Monitoring Support**

The CSV supports environmental monitoring campaigns carried out within and around the Terminal area.

Activities may include:

- Marine environmental surveys.
- Water sampling campaigns.
- Foam monitoring and abatement activities.
- Deployment and recovery of environmental monitoring equipment.
- Support to third-party environmental contractors.

Such activities shall be conducted in accordance with the applicable Adriatic LNG environmental procedures and regulatory requirements.

- **Emergency Response and Special Services**

The CSV constitutes a key emergency response resource for the Terminal and shall remain available to support emergency operations whenever required.

Emergency services include:

- Medical Evacuation (MedEvac).
- Casualty Evacuation (CasEvac).
- Man Overboard response.
- Personnel recovery from the water.
- Emergency transportation of personnel.
- Support to emergency drills and exercises.

The vessel shall maintain a readiness level allowing mobilization for MedEvac and CasEvac services 24 hours per day, 7 days per week, in accordance with contractual requirements.

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- ## Communications

The Vessel Master shall maintain continuous communication with the Terminal CCR and relevant maritime authorities.

As a minimum:

- The Coast Guard shall be contacted upon departure from the navigation channel and provided with the number of persons on board and the nature of the cargo carried.
- The Terminal CCR shall be notified upon entering the Area To Be Avoided (ATBA).
- Any operational limitation, equipment failure, or unsafe condition affecting the vessel's capability to perform its assigned duties shall be immediately communicated to the CCR.

- ## Operational Requirements

The CSV shall at all times:

- Be operated within its certified design limitations.
- Be maintained in a seaworthy condition.
- Be fully compliant with applicable Flag State, Port State and Classification Society requirements.
- Comply with SOLAS, MARPOL, ISM Code and ISPS Code requirements.
- Be suitably manned by qualified and certified personnel.
- Be capable of supporting Adriatic LNG operations on a 24/7 basis, weather permitting.

The Vessel Master remains responsible for the safe navigation and operation of the vessel and has full authority to suspend any activity that may compromise the safety of personnel, the vessel, the Terminal or the environment.

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8 CARGO HANDLING AND TRANSFER EQUIPMENT

The terminal operates as an LNG regasification facility.

8.1 Equipment

For the management of unloading operations with LNG carriers, described in more detail below, has the following equipment:

- **LNG storage tanks:** with a total capacity of 250,000 m³ (two tanks of 125,000 m³ each).
- **BOG handling system**: Two reciprocating 2-stage BOG compressors (normally one on standby), operating at 0%, 25%, 50%, 75%, and 100% capacity, with a maximum flow rate of 12,600 m³/h.
- **Nitrogen capacity:** Approximately 500 m³/h (9 bar), used primarily for purging cargo loading arms during LNG carrier operations.
- **Other equipment:** dedicated to the internal process of regasification.

8.2 LNGC Operations

Operations will be carried out in accordance with OCIMF and SIGTTO guidelines. In particular, the standard sequence of operations includes, but is not limited to:

- **Pre-Checks:** The terminal and the LNG carrier each perform their respective checks, confirm the mooring plan, and verify readiness to conduct operations.
- **Berthing:** Mooring performed with Pilot, tugboats, and the support of Line Handler personnel ashore/afloat (as described above).
- **Setting the gangway:** Positioned by terminal personnel in the area indicated by the vessel's crew.
- **Establishing Ship/Terminal communication and ESD system:** Cable links placed in the manifold area and connected by the ship's crew.
- **Ship/Terminal pre-transfer meeting:** Held between the vessel and terminal representatives, including the Pre-Transfer Meeting Agenda and sharing of the discharge plan.
- **Connecting the vapour return arm:** Managed jointly by the terminal and the vessel.
- **Connecting the liquid discharge arms:** Managed jointly by the terminal and the vessel.
- Purging with N_2 and leak testing the Ship/Terminal joint: Performed jointly by the terminal and the vessel.
- **Returning boil-off vapour to the LNG carrier:** Managed by both the vessel and the terminal.
- **Pre-transfer ESD-1 test under warm conditions:** Conducted jointly by the vessel and the terminal.
- **Cooling down the liquid loading arms:** Managed jointly by the vessel and the terminal.
- **Pre-transfer ESD-1 test under cold conditions:** Conducted jointly by the vessel and the terminal.
- **Start of transfer:** Managed by both the vessel and the terminal.
- **During transfer:** Managed by both the vessel and the terminal.
- **Rate down:** Managed by both the vessel and the terminal.
- **Draining/Inerting the liquid loading arms with N_2:** Performed jointly by the terminal and the vessel.
- **Purging/Inerting the vapour return arm with N_2:** Performed jointly by the terminal and the vessel.
- **Disconnecting the liquid loading arms:** Managed by both the terminal and the vessel.
- **Disconnecting the vapour return arm:** Managed by both the terminal and the vessel.
- **Ship/Terminal post-transfer meeting:** Held between the vessel and terminal representatives.

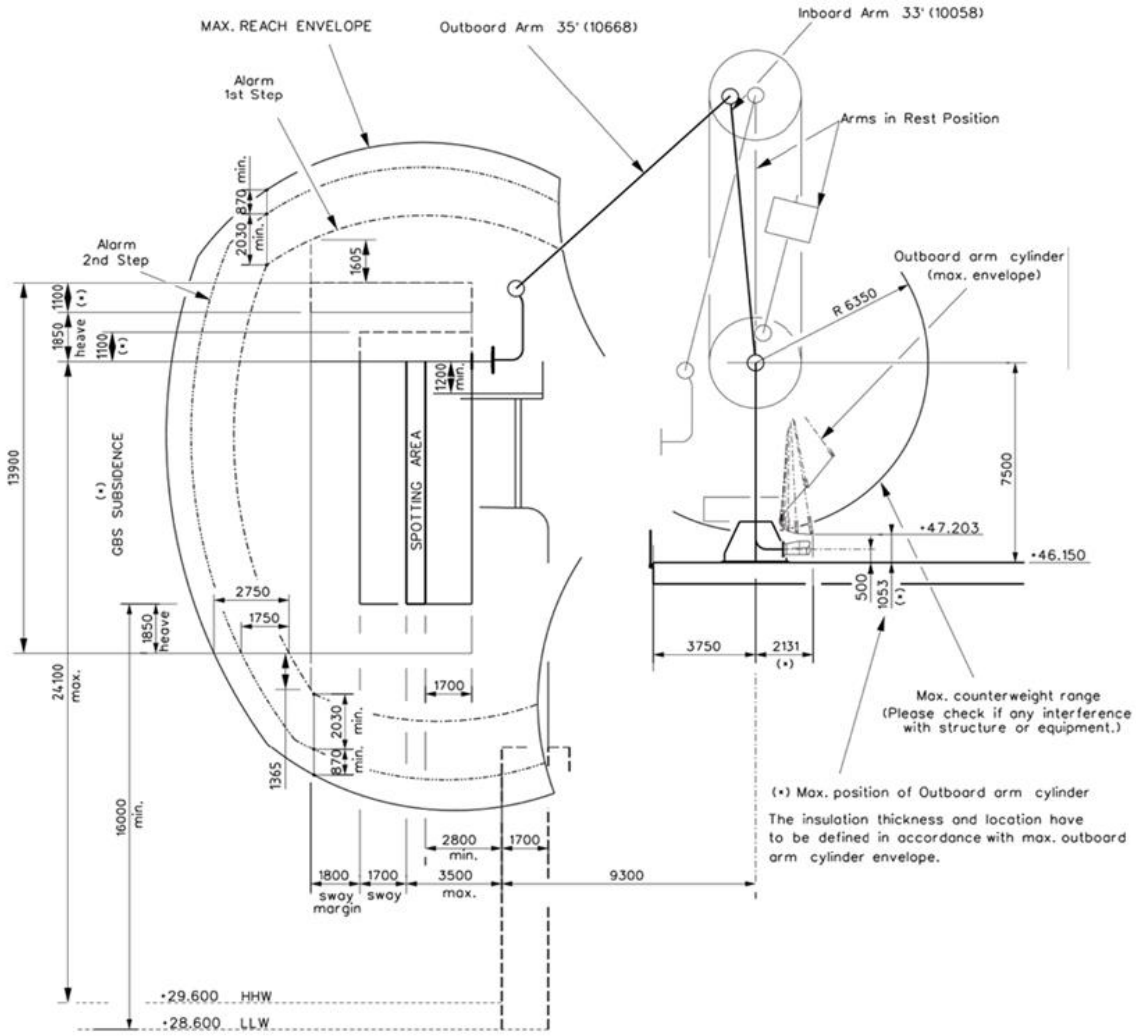
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- Disconnecting and removing the Ship/Terminal ESD communication links: Managed jointly by the terminal and the vessel.
- **Removing the gangway:** Managed jointly by the terminal and the vessel.
- **Unberthing:** Performed with Pilot, tugboats, and the support of Line Handler personnel ashore/afloat (as described above).

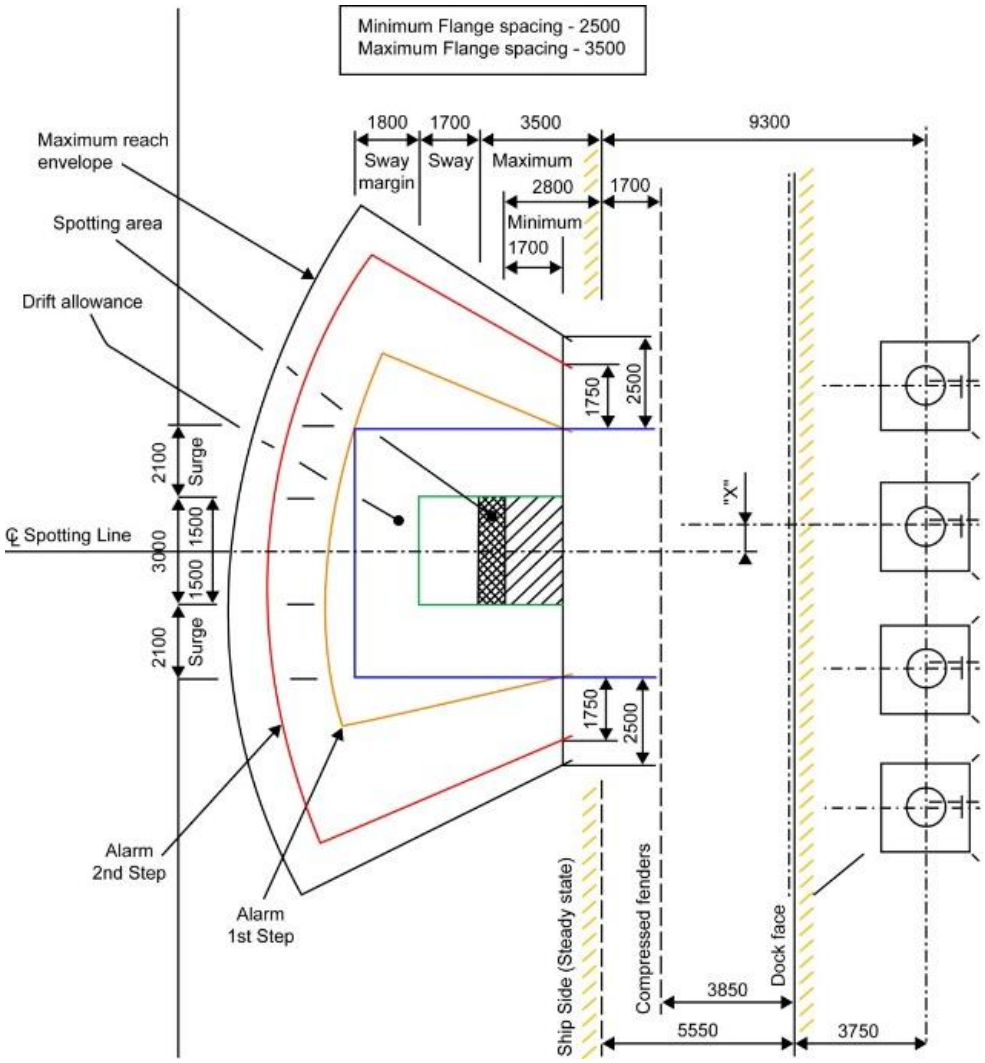
8.3 Liquid and Vapour line operating envelopes and characteristic

Designed arms information / limit

Size	Working limit
Liquid nr 3 size 16 Inches	Max temperature +45°C
Vapour nr 1 size 16 Inches	Min temperature -165°C
liquid Max flow 5000m3/hr (each)*	Max pressure 18.5 bar
Vapour max Flow 15000 m3/hr*	wind parking position 48knt
* as per maker datasheet	wind operation 38 knots



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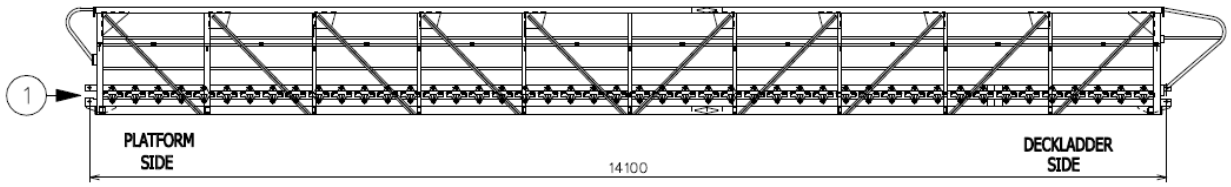


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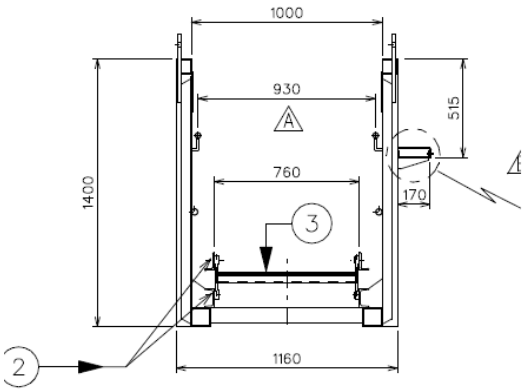
8.4 Gangway Arrangement for access between terminal and vessel's alongside

See also information reported on chapter access to terminal

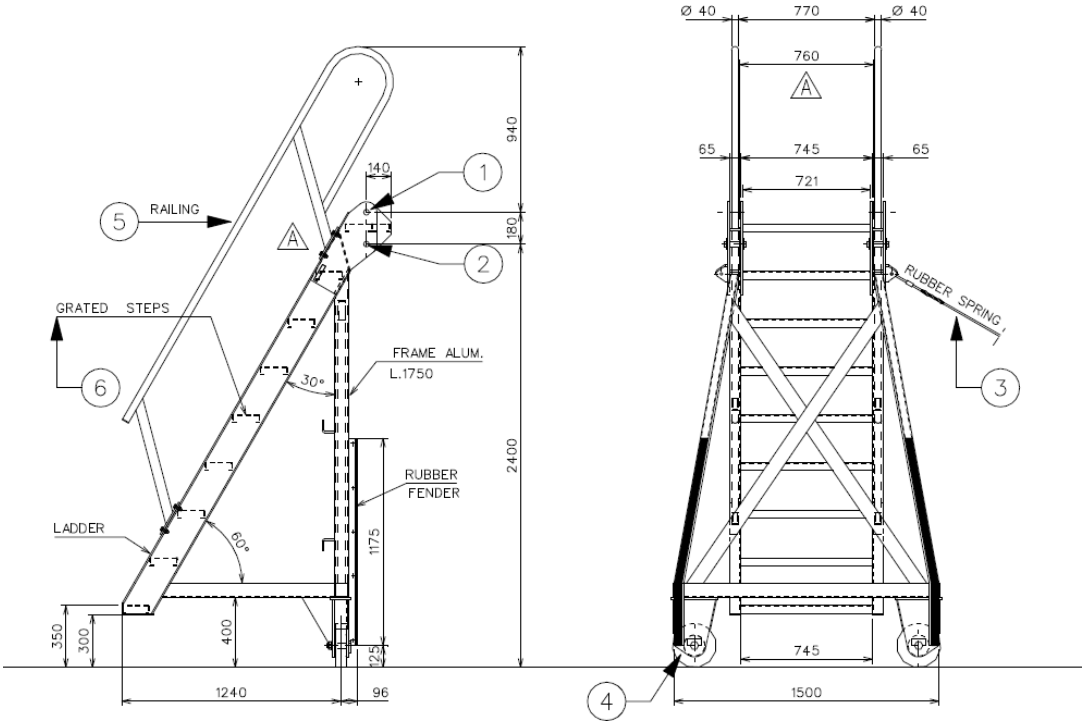
Dimensional characteristic



ALUMINIUM LADDER



SECTION A-A



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8.5 Ship/Terminal connection – cable links

8.5.1 Pin Configuration

SeaTechnik – Fiber Optic - Pin-out configuration

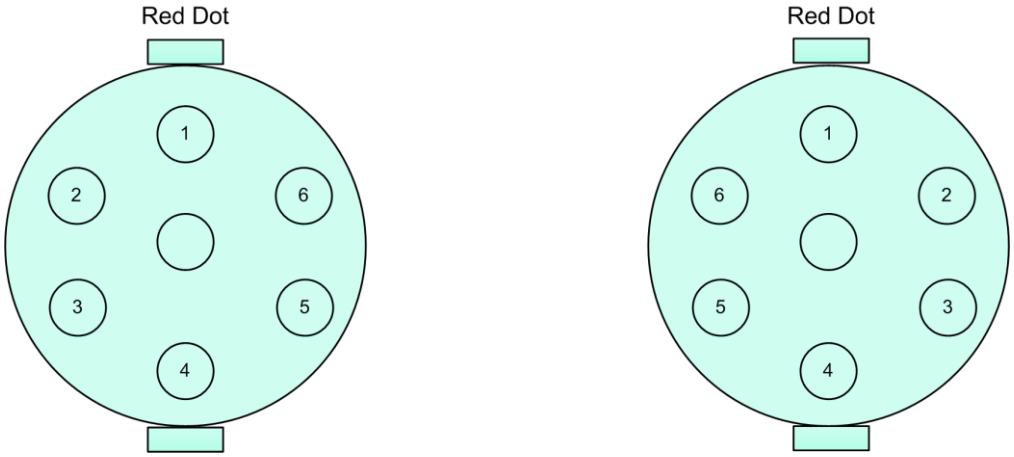
Lists the pin numbers and their signal.

The pin out configuration is shown in the Figure below. If the configuration is changed, it must be swapped at both, the Ship (LNGc) and Terminal side, at the equipment patch point.

Communications System Pin Signals

Pin Number	Signal
1.	Telephone channels 1 to 4 from ship to shore
2.	Telephone channels 1 to 4 from ship to shore
3.	ESD channels from ship to shore
4.	ESD channels from ship to shore
5.	Spare
6.	Spare

Pin-out Configuration



Shore Connection Ship Connection

Pins 1 and 2 contain four telephone channels each. These channels are multiplexed together, prior to conversion to or from the optical signal. The telephone channels are allocated as shown in the pin configuration in the Table below.

Communication System Pins Telephone Configuration

Pin Assignment	Signal
1.	Data channel (mooring line tension)
2.	Hot line telephone
3.	Public telephone
4.	Internal telephone

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SeaTechnik – Electric Wire Link

Alignment with the Vendor Specifications

Item	Specifications
Manufacturer	SeaTechnik, Pyle National, 37 pin
Connector type	37-way (conductor) electrical umbilical cable with Pyle National male end connectors at each end of the cable. Connector pins (contacts) are heavy gold cable.

Pyle National compatible electric system

The Safety link electric secure socket layer (SSL) system for emergency shutdown systems (ESDs) and telecommunications is normally intended for installation within the main Safety link cabinet as an add-on system with the fiber optic (FO) system (that is, a back-up system). Some systems are comprised of an electric system only.

When both systems are available, the two systems are completely separate and the electric system incorporates a changeover panel, the System Status Module. Some earlier systems may have a System Selector Module. The actual system selection is carried out within the System Status Module by means of a switch fitted to the module front panel.

It is not possible for both electrical and FO ship/shore connections to be made simultaneously, and for obvious safety reasons, both systems cannot be operated simultaneously.

The system conforms to the so-called “Pyle National” standard in use on most North Atlantic basin LNG terminals, and is designed to match to the specification for the project terminals which are so fitted.

The system relies on flameproof receptacle-type connectors compatible with AF-series Pyle National for connection at the ship end. The 37-way (Heavy Duty Environment resisting) HDE-Type Cenelec certified Pyle National connector carries both telecommunications and ESD on-off signals. Intrinsically safe (IS) barriers or Ex I Activation (Ex’ia’) relay isolators are installed in all ship-shore and shore-ship ESD circuits. This provides a back-up protection in the event of an emergency break- away/disconnection. In this event, the ship may be released from the jetty head by remote controlled mooring hooks and the loading arms by the powered emergency release couplings (PERCS). As it might not be possible to release the shipboard or Terminal Pyle plug manually, the live circuits exposed to the hazardous area are prevented from creating an incendive spark if the cable is broken by Ex’ia’ relay isolators / IS barriers. However, the telephone circuits at 48 VDC / 78 VAC cannot be protected by Ex’ia’ techniques, but are energized only from Terminal voltage and are generally isolated by relay contacts at the Terminal side, actuated by the emergency break-away/disconnection control. A set of relays within the system status module (STM) provide the isolation on disconnection.

Configuration of 37-way connector

Following Table shows the standard pin configuration for the PYLE connector.

37-Pin Electrical Cable (Pyle National) Configuration

Pins	Function	IS cct	Shore/ Ship	Ship/ Shore
1, 2	Sound powered telephone	No*	X*	X*
3, 4	Spare	No		
5, 6	Hot phone	No	X	X

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7, 8	Public / private automatic branch exchange (PABX) telephone	No	X	X
9, 10	PABX telephone	No	X	X
11, 12	4-20 mA signal vapor line pressure	Yes*		X*
13, 14	ESD Terminal to LNGc (volt free contact on Terminal open for ESD)	Yes	X	
15, 16	ESD LNGc to Terminal (volt free contact on LNGc open for ESD)	Yes		X
17, 18	Continuity check link on LNGc	Yes		
19, 20	Continuity check link on LNGc	Yes		
21, 22	Terminal to LNGc Terminal tank high level (HL) ESD trip	Yes*	X*	
23, 24	ESD Terminal to LNGc	Yes*	X*	
25, 26	ESD Terminal to LNGc loading arm first stage	Yes*	X*	
27, 28	ESD Terminal to LNGc loading arm second stage	Yes*	X*	
29, 30	IS 24 VDC, 35 mA maximum for Terminal Electrical Trades Union (ETU)	Yes		
31, 32, 33	Mooring load monitor (MLM) data connection using RS-232 signaling interface and IS barrier	Yes	X	X
33, 34	Spare	No*	X*	X*
35, 36	IS 24 VDC, 35 mA maximum for LNGc ETU	Yes		
37	Spare	No*	X*	X*

Note: * Optional functions

The ship is normally fitted with an identical Pyle system for the telecommunications and ESD circuits. In practice, the ship provides a 50 m umbilical cable which has a Pyle plug fitted to each end of the cable. One end connects into the Pyle receptacle inside one of the shipside boxes found on the ship, the other end of the cable connects to the receptacle on the shore. This umbilical cable connection then completes the circuits between the SSL systems on the ship and shore.

ESD operation ship to Terminal is by the opening of a volt free contact on board the ship which trips the ESD relay on the shore system. ESD operation Terminal to ship is by the opening of a volt free contact on the shore system which trips the ESD relay on board the ship.

Receptacles

The receptacle is fitted with a 1 1⁄2 in normal pipe thread (NPT) connection for the Ex'd' gland.

Connection to the cable installed at the receptacle is by heat shrink solder-less crimp splice connectors for the 37-way receptacle.

The connector and receptacle are not intended for connection/disconnection while energized.

The principal dimensions are shown in Figure below.

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8.6 Nitta Moore – Pneumatic Hose Connection

The following table lists the basic specifications for the Nitta Moore – pneumatic hose connection.

Item	Specifications
Manufacture/model	Nitta Moore SVHN8 series
Connector type	½ in. BSP Snaptite male connector with adapter link female-female
Air pressure	Normal pressure: 3.5 barg Activation pressure: 3.0 barg

8.7 Apparatus for the transfer handling gear

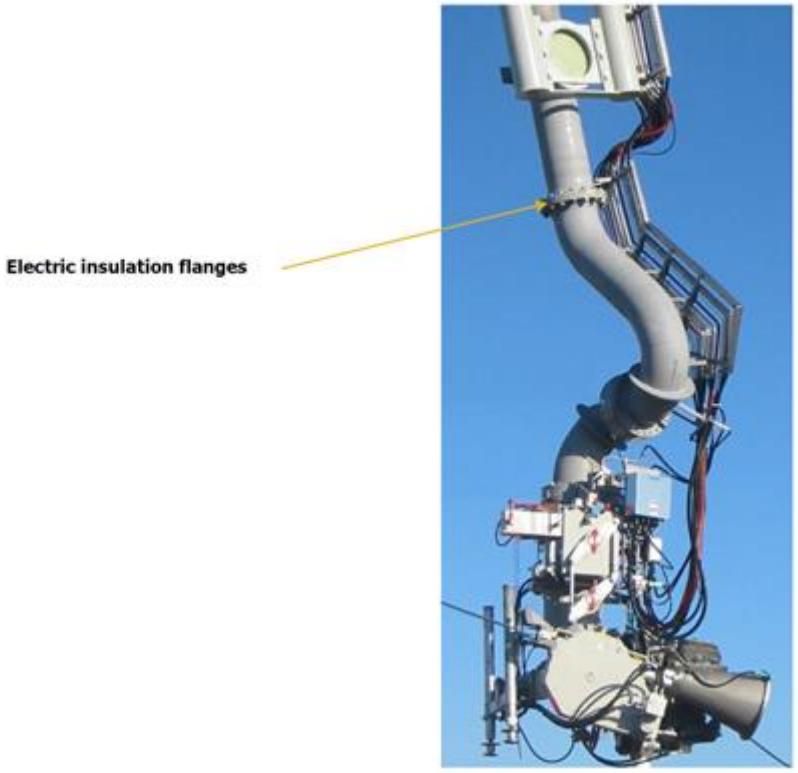
To guarantee a normal operation on board, the Terminal is equipped with 2 cranes:

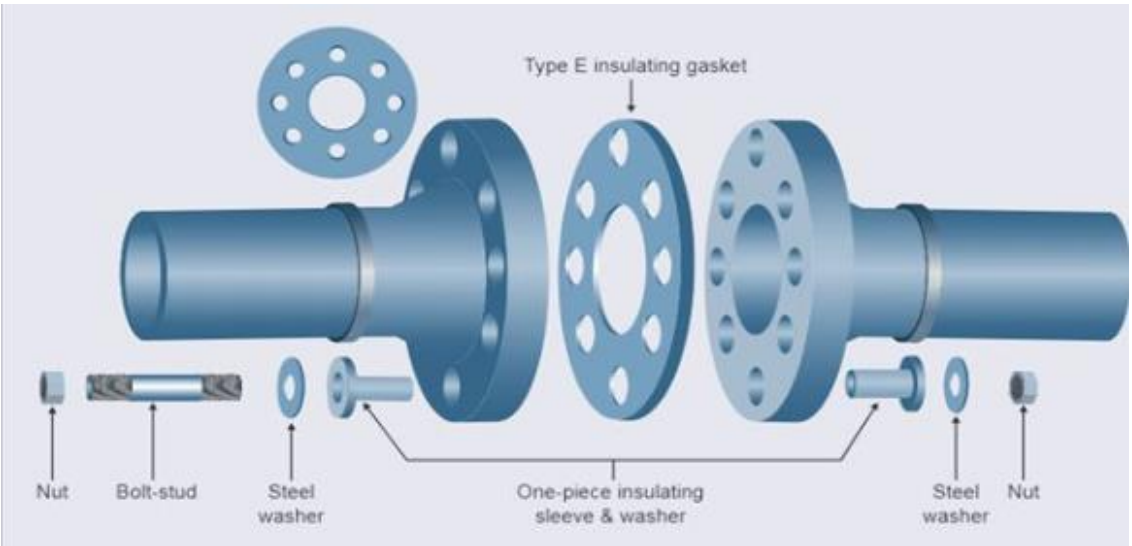
- North side:
  - SWL 36t (big hook) – boom range 33m;
  - SWL 5t (small hook) – boom range 38m;
  - maximum wind 48Knt
- South side:
  - SWL 36t (big hook) – boom range 33m;
  - SWL 5t (small hook) – boom range 38m;
  - maximum wind 48Knt

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9 SHIP/TERMINAL ELECTRICAL ISOLATION SYSTEM

When the LNG carrier is moored, electrical discontinuity is ensured by the insulating flange at the manifolds and by the Teflon wheels on the gangway.

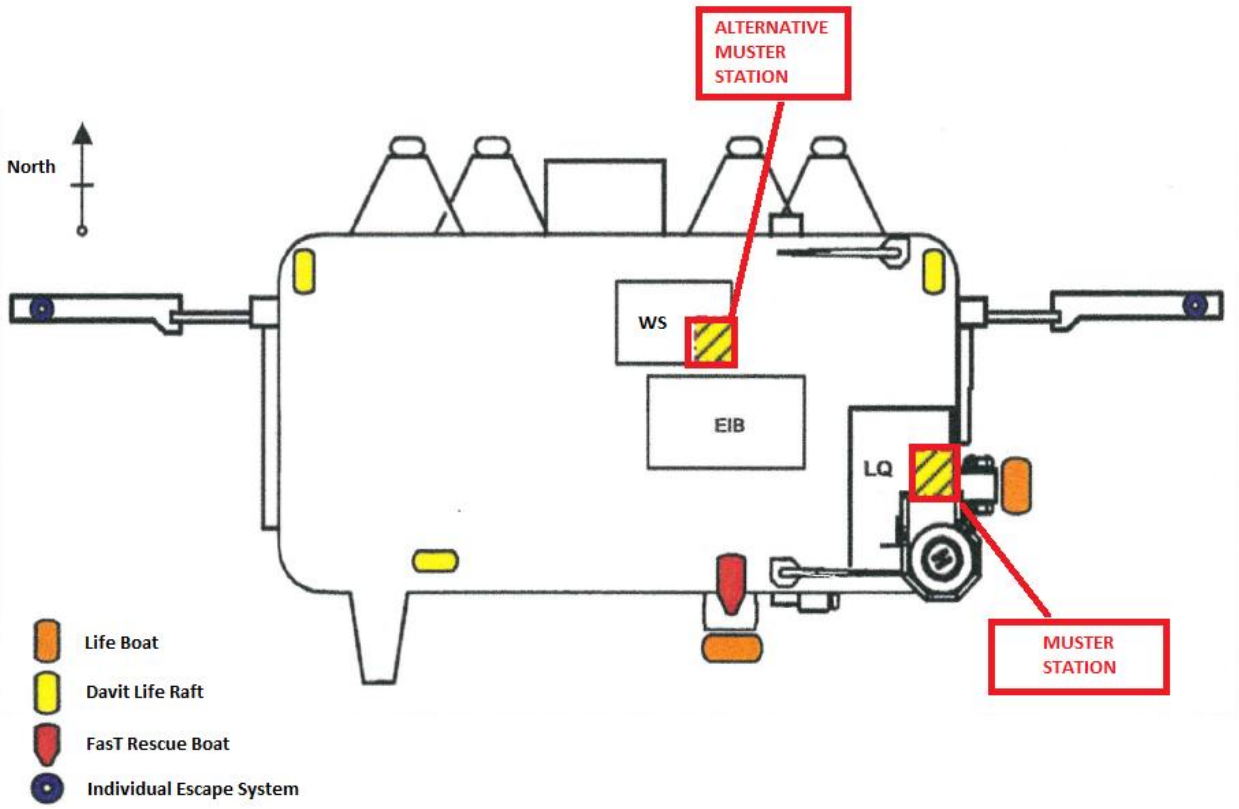




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10 EMERGENCY RESPONSE PLAN AND PROCEDURE

The terminal, in compliance with national and local regulations and with industry best practices, maintains internal and external emergency response plans, as well as a muster list for the identification and management of emergencies.



10.1 General

During commercial operations, minimum crew shall be maintained on board the vessel, capable of handling any emergencies, including unmooring, and ensuring the safety of the person, vessel and cargo.

The terminal is always manned with sufficient personnel to manage emergency situations.

In addition to LNG Carrier specific emergency procedures, the Master shall observe the following procedures (from the first listed action to the last action) in the event of an emergency situation arising on the LNG Carrier and/or the Terminal:

- Sounds a continuous blast on the whistle.
- Sounds the general alarm.
- Stops Unloading and prepare to loading arms disconnection.
- Informs the Terminal Representative.
- Initiates the LNG Carrier's emergency response procedure.
- Informs the Maritime Authority.
- If deemed necessary, a request shall be made for the mobilization of the tugs' fire-fighting capabilities. Based on the information provided by the LNG carrier, ALNG will notify all relevant internal functions and coordinate the deployment of the Terminal's fire-fighting resources as required.

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- Coordinates the firefighting operations onboard of vessel and directing the use of official emergency teams and the Terminal's firefighting equipment. If the fire cannot be controlled or contained or if the Terminal installation is seriously endangered, the Master and Terminal Offshore Installation Manager shall determine the necessity of removing the LNG Carrier from the berth.
- Upon notification of any incident associated with the LNG Carrier, communications will be established between the Offshore Installation Manager, Master and Maritime Authority to confirm and organize an appropriate level of response.

The following incidents, or combination of incidents, may potentially occur while the LNG Carrier is alongside the Terminal (non exhaustive list):

- Fire/Explosion.
- Pollution.
- Uncontrolled release of LNG or LNG Vapor.
- Man Overboard.
- LNG Carrier out of position.
- ESD.

The LNG Carrier's Crew and Terminal Staff Shall Immediately:

- notify ALNG or LNG Carrier Control Room of any situation or condition that may compromise the safety and/or integrity of the operation and
- if required, activate the emergency shutdown.

Any situation that compromises the operation must be reported to the master and terminal offshore installation manager

10.2 Oil spill and vapour release

Venting cargo vapor to the atmosphere is not permitted.

The Master is required to report in due time all incidents of cargo vapor venting to the Terminal and take all necessary action to prevent accidental venting.

In the event of an emergency during which venting occurs notwithstanding Master's diligence cargo handling operations will be immediately stopped.

In the event of LNG leakage (including vapor release), LNG Carrier personnel shall immediately stop Unloading and/or activate the emergency shutdown system, if necessary.

If the gas cloud formed threatens the Terminal/berth area, the remote-controlled water monitors and other water spray systems shall be used by ALNG to control the gas cloud. If necessary, the personnel at the berth will be evacuated.

Operations may resume only when leakage is fixed and the cause of leakage is established.

In the event that LNG leakage occurs on the jetty and/or loading arms, ALNG shall immediately request the LNG Carrier to stop discharging or activating the emergency shutdown system, if necessary.

If the LNG leak endangers the LNG Carrier's structure, the water monitors on the Terminal shall be used to assist in preventing sub cooling of non-cryogenic structures of the LNG Carrier.

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The LNG Carrier is required to maintain a water curtain at the shipside in the loading arm area throughout the periods when the loading arms are connected

10.3 Fire and explosions

The Master must immediately, and under his own responsibility, activate all firefighting and safety measures to safeguard the ship and the crew and to protect them from any potential danger; he must also immediately stop the discharging operations, intercept the flow of LNG and immediately notify the Terminal.

10.4 Evacuation (evacuation route and muster point map)

Terminal personnel and vessel crew must proceed to the assigned points and follow the instructions detailed in the:

- Terminal Emergency Plans and “Muster List”
  or
- Vessels Emergency Plans and “Muster List”

to manage the ongoing incident.

10.5 Emergency Escape

The following pertains to emergency escapes:

- A Pilot Ladder or Accommodation Ladder shall be rigged and positioned on the outboard side of the LNG Carrier.
- The Accommodation Ladder shall be swung outboard ready for immediate lowering in case an emergency escape is required.

10.6 Collision/damage to berth

To avoid damage especially but not limited to the fenders, the LNG Carrier shall be landed squarely onto the fenders with a contact speed not exceeding 15 cm/second.

Approach sensors are available on the terminal; an approach panel with sensor data placed on the terminal is visible from the Vessel’s navigation bridge.

See Attachment 3 “Fender Specification”

10.7 Medical emergency

While there are limited medical facilities available on the Terminal, emergency medical evacuation to shore may be organized by ALNG upon request and at the expense of the LNG Carrier.

The transportation mode depends on logistic planning and availability and is decided by ALNG. Ship’s Agent makes written requests to ALNG for medical evacuation. The Ship’s Agent is responsible for logistic arrangements for the evacuees upon arrival on shore.

The Master, or Agent, must notify Local Authority.

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10.8 Security breach

No Person other than the Pilots, Customs officials, immigration officer, Ship's Agents, Maritime Authority or Terminal Representative is allowed to board or disembark from an LNG Carrier until clearance has been obtained from the Government Entity having jurisdiction on the Terminal, the LNG Carrier and the Master.

ALNG, among other things:

- reserves the right to request that personnel produce personal identification; and
- reserves the right to escort to or from the LNG Carrier any unannounced visitors or persons whose conduct may present a hazard to personnel or Terminal property; and
- reserves the right to board the LNG Carrier at any time to ensure that the Terminal Regulations are being complied with and to stop any and all operations of the LNG Carrier in the event of breach of the Terminal Regulation; and
- has the sole and exclusive right to give access to the berthing area.

SHIPBOARD PERSONNEL ACCESS TO THE TERMINAL IS NOT PERMITTED WITHOUT PRIOR APPROVAL FROM THE ALNG AND WITH THE ALNG ESCORT.

10.9 Person overboard

In case of man overboard from the vessel, recovering responsibility is upon Master.

LNG Carrier's personnel must use a safety harness in addition to the life jacket when lowering/raising the handrail

10.10 Emergency Shutdown (ESD)

In the event of an alarm at the Terminal during the transfer of LNG from the vessel, it is mandatory to activate the emergency shutdown procedure, which includes the immediate closing of the interception valves (ESD), as well as the activation of the specific fire-fighting, anti-pollution and safety measures as indicated in the "Terminal Emergency Plans" for LNG.

Justifications for activating an Emergency Shutdown include any emergency situation such as, but not limited to:

- fire,
- explosion,
- LNG leakage or spillage,
- failure of strategic equipment, or
- any other event likely to endanger the Terminal, LNG Carrier, or their equipment or personnel.

The Terminal Representative may direct the LNG Carrier to stop cargo operations and to prepare for emergency loading arm and LNG Carrier release.

The goal of the Cargo Emergency Stop System is to prevent or minimize damage to personnel, property, and the environment.

After the incident, a joint investigation of the incident and a survey of the LNG Carrier may be carried out by the Master, the Offshore Installation Manager, Maritime Authority and other ALNG Personnel.

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Activation of ESD

ESD1:

- PSD (process Shut down)
- ESD (Emergency Shut Down)
- Low pressure on main header
- Suddenly close of vapour SDV (Shut down valve)
- SDV (Shut down valve) header
- Push button in CCR (Cargo Control Room)
- Push button local
- from PLC closure of DBV (Double Block Valve) ERS (Emergency Release system)
- Vapour ERS closure of DBV (Double Block Valve)

ESD2:

- Local PLC command
- CCR (Cargo Control Room) command
- PMS (Position Monitoring System) command in case of misalignment

10.11 Incident notification policy

Upon notification of any incident associated with the LNG Carrier, communications will be established between the Offshore Installation Manager, Master and Maritime Authority to confirm and organize an appropriate level of response.

Subsequent actions to be taken will depend on how the particular incident develops.

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11 EMERGENCY PROTOCOLS

In activities involving interface with marine units, and based on internal assessments, the following represent some of the expected emergency scenarios:

- Emergency release mooring hooks
- Flaring;
- Leak from loading arm
- Leak from LNG Carrier Manifold
- Gas leak from Export Riser on West side of GBS Wall
- Gas leak from Subsea export line
- Fire or another Emergency on LNG Carrier when alongside
- Fire or another Emergency on Terminal when LNG Carrier alongside
- Bomb threat / suspicious package
- Man Overboard
- Search and rescue
- Vessel or drifting Object on collision course
- Life boat evacuation
- LNG Carrier out of position
- Serious Occupational accident or Acute medical Situation (Terminal / LNG Carrier)
- Antipollution (from hydrocarbon and chemicals)

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12 SAFETY AND SECURITY VISITOR'S INDUCTION

All personnel admitted to the terminal, including ALNG's workers, receive a safety induction before boarding on the vessel that allows access to the facility.

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13 STAND-BY TUGBOAT(S)

During LNG Carrier cargo operations, 4 tugboat, Firefighting class 1, remain on the areas, as reported on previous chapter, ready to assist on request of LNG Vessel's Master or OIM.

Upon OIM request 1 or more tugs may attend other terminal activities.

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14 ATTACHMENTS AND FORMS

14.1 Attachments

ALL-01-R00_PG-19_Terminal Regulations & Info Booklet

ALL-02-R00_PG-19_Acceptance Criteria - Vetting Procedure Guide

ALL-03-R00_PG-19_Fender specification

14.2 Forms

MOD-01-R00_PG-19_ALNG questionnaire