

dunkerque LNG 
fluxys operated by **gaz-opale**



Ship Shore Safety and Security handbook

Revision 6.0



Ship Shore Safety and Security handbook - Revision 6.0

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Résumé : This document contains in several parties the necessary information for the call of an LNG Carrier at the Dunkerque LNG Terminal, including the relevant ship/shore and Dunkirk Port information for the arrival and the mooring of an LNG Carrier, the cargo unloading or reloading operations and the departure of the LNG Carrier.

Type
NOR

Émetteur

-

N° Chrono
DLNG-00002

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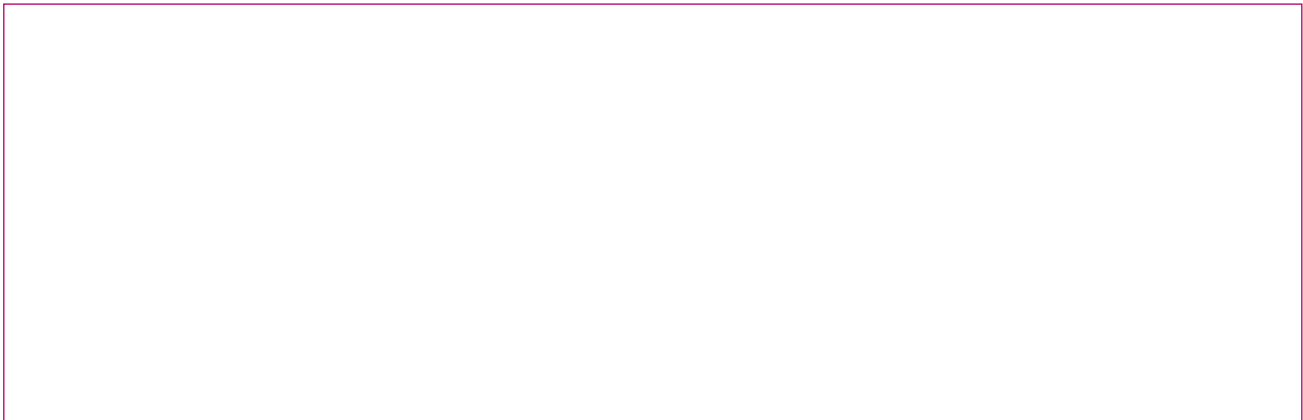
Diffusion

Intern e		Extern e	
X	CODIR		
X	Direction des opérations		
X	Direction commerciale		
X	Direction finances		
X	Direction juridique		

Revision



Revision	Modifications and/or corrections
1.0	First validated version
2.0	Nautical rules in line with the Port Regulations Communication at "All Fast" Add ATEX regulation for access to the jetty and deliveries for the ship Deliveries by barge Tugging configuration for leaving the port ESD clarification
3.0	Phase exploitation
4.0	Reloading services
5.0	Extension of anchorage area Scenario added: mooring line break Fast reloading project implementation
5.1	Specific Annex for small scale added on page 50.
5.2	Fine tuning especially around stores management
6.0	Certificate of origin request for LNG cargoes strengthening alcohol and drug policy Request for fire wires. New paragraph in page 32 : special operations



Dunkerque LNG

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INTRODUCTION



This document contains the necessary information for the call of an LNG Carrier at the Dunkerque LNG Terminal, including the relevant ship/shore and Dunkirk Port information for the arrival and the mooring of an LNG Carrier, the cargo unloading or reloading operations and the departure of the LNG Carrier.

This document does not replace any of the formal Terminal or Port procedures, but it simply highlights some significant information. The Master is advised to contact the Port of Dunkirk for all Marine matters.

Masters using this Ship Shore Safety and Security Handbook are obliged to make sure they have the latest version of the Dunkirk Port regulations and international regulations at their disposal and may not rely on this document for the correct version of any applicable laws, regulations or international standards or practices. Masters are also obliged to make sure they are in compliance with all health, immigration, notification and customs requirements.

Dunkerque LNG is the owner of the whole facility and is responsible for the industrial and commercial exploitation of the LNG Terminal. However, the LNG Terminal will be operated via the operating company Gaz-Opale which will perform the maintenance and the operations of the LNG Terminal on behalf of Dunkerque LNG.

Gaz-Opale will take care of the whole unloading and reloading operations and will also take the lead for the approval of the LNG Carriers.

The process of approval of a ship makes it possible to guarantee that this ship, including its sister ships, are compatible with the terminal of Dunkerque LNG for a duration of 3 years.

A ship not approved by Gaz-Opale as part of the procedure cannot be accepted at the Dunkerque LNG Terminal.

There are no COU (conditions of Use) and free practices applicable at Dunkerque harbour.

The Dunkerque LNG Terminal is designed to unload and reload LNG Carriers and has an annual regasification capacity of 13 billion m³ gas. The terminal is equipped with the following facilities:

- // A jetty and marine platform, which is able to receive LNG Carriers between 5,000 m³ LNG up to 267,000 m³ LNG, with a guaranteed depth of 14,5 meters (maximum draft) at the berth;
- // Three storage tanks with a net capacity of 200,000 m³ of LNG, each;
- // A regasification unit composed by 10 Open Rack Vaporisers to regasify the LNG and to inject the natural gas into the grid. The maximum send-out capacity is 1,9 million (n)m³/hour.



DEFINITIONS AND ABBREVIATIONS

ATEX: Atmosphères Explosibles – ATEX directive describing what equipment and work environment is allowed in an environment with an explosive atmosphere

Cargo: means a quantity of LNG (expressed in m³ and MWh) (un)loaded or to be (un)loaded from or into an LNG Carrier at the Terminal;

Cargo Information Notice: means the notice defined in Article 1, Part 1.

COU: Conditions Of Use – Not applicable at Dunkerque

CTMS: Custody Transfert Measurement System

ESD: Emergency Shut Down. ESD 1: ESD 2.2B appellation for LNG Terminal and ESD 2: ESD 2.2A appellation for LNG Terminal

ETA: Estimated Time of Arrival

FAL: Convention on Facilitation of International Maritime Traffic (FAL Convention)

GCV: Gross Calorific value

GLE: Gas LNG Europe

GPMD Port Authorities: Grand Port Maritime de Dunkerque – Port Authorities

Hi-Ex: High Expansion (foam)

HMPE: High Modulus Polyethylene Fiber Rope

HSEQ: Health Safety Environment and Quality

ICS: International Chamber of Shipping

IMO: International Maritime Organization

ISGOTT: International Safety Guide for Oil Tankers and Terminals

ISPS: International Ship and Port Facility Security-code

ISM: International Safety Management

Jetty Security Officer: Person in charge of the access of people and vehicles to the jetty during the call of an LNG Carrier located in the security post at the entrance of the Terminal

Loading Master: the person responsible at the Dunkerque LNG Terminal for the operations related with the unloading or reloading operations during the call of an LNG Carrier as described on Article 2, Part 5.

LNG: Liquefied Natural Gas

LNG Carrier: means any ocean-going LNG vessel, scheduled or to be scheduled at the Terminal for an unloading or reloading operation

MARPOL: International Convention for the Prevention of Pollution from Ships

Master: The commander or first officer of a ship; a captain.

Main Control Room: the Terminal principal control room

MSC: Marine Safety Committee

NOR: Notice of Readiness as defined in Article 4 Part 1

OCIMF: Oil Companies International Marine Forum

P & I: Protection and Indemnity Club

PBS: Pilot Boarding Station, located at Dyck Buoy

PERC: Powered Emergency Release Coupler

PFSO: Port Facility Security Officer

Ship Cargo Control Room: Control Room on board of the LNG Carrier.

Ship Operator's Agent SIRE: Ship Inspection Report

SIGTTO: Society of International Gas Tanker & Terminal Operators Ltd.

SOLAS: International Convention for the Safety of Life at Sea

SOPEP: Shipboard Oil Pollution Emergency Response Plan

SSO: Ship Security Officer

VTS: Vessel Traffic Services

PART 1: PRE- ARRIVAL COMMUNICATIONS

1. CARGO INFORMATION NOTICE

Immediately or as soon as practical after the departure of the LNG Carrier to the LNG Terminal, a Cargo Information Notice completed in English shall be received by the Terminal containing all relevant information about the origin, quantity, quality and composition of the cargo and the conditions under which the tanks of the LNG Carrier are operated. In addition, the cargo information notice must include any request for additional services to be performed during the call as well as any information affecting the LNG Carrier capability to perform the operations.

The template of the Cargo Information Notice is included in the Appendix 1 of this document.

This notice shall be sent by e-mail to:

// Dunkerque LNG and Gaz-Opale:

- controlroom@gazopale.com: Control room
- loadingmaster@gazopale.com: Loading Master Dept.
- ext-security@gazopale.com: Security Services
- DKoperations@dunkerquelng.com: Dunkerque LNG Commercial Dept.
- directionoperations@dunkerquelng.com: Dunkerque LNG Operational Dept.

// Ship Operator's Agent

// Pilot Services of Dunkirk : tov@pilotagedunkerque.com

// Harbour Master Office: harbourmaster@portdedunkerque.fr

2. ESTIMATED TIME OF ARRIVAL (ETA)

The Master of the LNG Carrier shall give an ETA Notice containing the estimated time of arrival of the LNG Carrier at the Pilot Boarding Station, located at Dyck Buoy, to Dunkerque LNG and Gaz-Opale and to any other competent authority (as may be required) upon departure of the LNG Carrier from the Last Port.

Each ETA Notice, (see template in Appendix 1), shall contain details and updated information about the LNG volume remaining on board, the LNG temperature and the temperature and pressure of the vapour in the tanks of the LNG Carrier.

Each ETA Notice must be updated or confirmed (as the case may be) at the following intervals :

// Ninety-six (96) hours before the LNG Carrier's arrival at the Pilot Boarding Station

// Seventy-two (72) hours before the LNG Carrier's arrival at the Pilot Boarding Station

// Forty-eight (48) hours before the LNG Carrier's arrival at the Pilot Boarding Station

// Twenty-four (24) hours before the LNG Carrier's arrival at the Pilot Boarding Station

// Twelve (12) hours before the LNG Carrier's arrival at the Pilot Boarding Station

// Two (2) hours before the LNG Carrier's arrival at the Pilot Boarding Station

In addition to the intervals specified above, the Master shall send an update of the ETA Notice:

// Between the departure of the LNG Carrier with the Cargo Information Notice and 96 hours before arrival at the PBS, in case the updated estimated time of arrival is not within its Scheduled Arrival Window or in case of an event which could have an impact on the planned operations of the terminal.

// Promptly if there is a change of the ETA of more than six (6) hours, before the LNG Carrier has reached the 48 hours in advance of the ETA;

// Promptly if there is a change of the ETA of more than two (2) hours within the window of 48 hours before ETA.

These notices shall be sent by e-mail to:

// Dunkerque LNG and Gaz-Opale:

- controlroom@gazopale.com: Control room
- loadingmaster@gazopale.com: Loading Master Dept.
- ext-security@gazopale.com: Security Services
- dkoperations@dunkerquelng.com: Dunkerque LNG Commercial Operations Dept.
- directionoperations@dunkerquelng.com: Dunkerque LNG Operational Dept.

// Ship Operator's Agent

In addition, the notices to be transmitted at 48, 24, 12 and 2 hours arrival at PBS shall also be sent to:

// Harbour Master Office: harbourmaster@portdedunkerque.fr

// Pilot Services: tov@pilotedunkerque.com

In case of unexpected or urgent problems, having an impact on the ETA, the LNG carrier shall inform Harbour Master Offices and Pilot Services immediately by phone

// Harbour Master Offices: + 33 3 28 28 75 96

// Pilot Services: +33 3 28 66 10 70

In case of unexpected or urgent problems at 2 hours before ETA, the LNG carrier shall immediately inform:

// Dunkerque VTS by VHF 73

// Pilot Station by VHF 72 or by phone:

+33 3 21 35 69 93

In addition, if the call to Dunkerque is cancelled, the LNG Carrier shall report immediately: "Call to Dunkerque is cancelled".



3. OTHER PRE-ARRIVAL FORMALITIES

Before entry into the Port of Dunkerque, the LNG Carrier shall notify by e-mail the Ship's Waste Form and the ISPS Notice of Pre arrival to the Ship Operator's Agent as soon as possible and at least 48 hours prior to arrival at the PBS.

The LNG Carrier shall report by e-mail all forms required by GPMD Port Authorities related to the IMO standardized FAL forms to the Ship Operator's Agent as soon as possible and at least 24 hours prior to arrival at the PBS. This information includes:

- // IMO General Information**
- // Cargo Declaration and certificate of origin**
- // Ship's stores Declaration**
- // Crew's effect Declaration**
- // Crew List**
- // Passenger List**
- // Dangerous Goods (to send at departure of the loading port if the location is out of European Union)**

The LNG Carrier shall report by VHF (73 and 72, respectively to Dunkerque VTS and the Pilot Station) the ETA 2 hours prior to arrival at the PBS.

The LNG Carrier shall inform Dunkerque VTS by e-mail 24 hours previous to the arrival at the Pilot Station buoy, that, according to her best knowledge, no defects have been found nor are to be foreseen, either at the vessel, the engine or the equipment. Depending on the kind of possible defects, access to the port can either be granted or refused. Changes in the situation shall immediately be reported by e-mail to the Dunkerque VTS.

4. TERMINAL STATUS NOTICE

Dunkerque LNG shall send by e-mail a Terminal Status Notice to the Master of the LNG Carrier at least twenty-four (24) hours prior to ETA. The Terminal Status Notice gives clearance to berth and will give the status of the Terminal which is a formal notice that the terminal is fit in every way to receive the LNG Carrier and to start the (un)loading operation.

If relevant, the Terminal Status Notice shall specify the acceptance or rejection for any request for additional services to be performed during the call (bunkering, stores, cooling down, ...) and the allowed time for performing such services.

The template of the Terminal Status Notice included Appendix 1 of this document.

5. NOTICE OF READINESS (NOR)

When the LNG Carrier arrives at the PBS (Pilot Boarding Station), has received all necessary port clearances from the Port Authority and any other Competent Authorities and has complied with all necessary customs notification requirements and is ready in all respects to proceed to berth and unload / load at the Terminal, the Master of the LNG Carrier (or the Ship Operator's Agent) shall confirm with the Notice Of Readiness that the LNG Carrier is fit in every way to transfer LNG.



This notice shall be sent by e-mail to:

// Dunkerque LNG and Gaz-Opale:

- controlroom@gazopale.com: Control room
- loadingmaster@gazopale.com: Loading Master Dept.
- ext-security@gazopale.com: Security Services
- DKoperations@dunkerquelng.com: Dunkerque LNG Commercial Operations Dept.
- directionoperations@dunkerquelng.com: Dunkerque LNG Operational Dept.

// Ship Operator's Agent

The template of Notice of Readiness is included in Appendix 1 of this document.

6. REJECTION OF THE NOTICE OF READINESS

Following receipt of the Notice of Readiness from the LNG Carrier, Dunkerque LNG may reject such Notice of Readiness. Reasons for rejecting the NOR shall be indicated.

The Notice shall be sent by e-mail to the Master of the LNG Carrier.

7. CALL FOR END OF MOORING MANOEUVRE – ALL FAST

During the mooring manoeuvre, a Harbour Officer or the Ship Supervisor will be on the jetty to supervise the mooring manoeuvre. He has direct contact with the pilot and the linesmen by radio. Together, they have to put the vessel in the correct position with the correct mooring configuration based on the approval certificate provided by Gaz-Opale during the compatibility study. At the completion of the mooring operation, the Master or Pilot will contact the main control room by radio VHF, channel 6, to confirm the completion of the mooring manoeuvre (ALL FAST) and that, as far as he is concerned, the gangway can be put safely on board the ship. A Harbour Officer could be on the jetty platform to acknowledge the end of mooring and all fast message.

8. READY TO DISCHARGE/RELOAD FORM

Once the LNG Carrier is safely moored, the Ship/Shore Safety Checklist has been validated by the Master and Loading Master and all administrative or customs authorizations required for the unloading/reloading have been obtained, the Loading Master shall prepare and present the Ready to Discharge / Reload form for signature. A hardcopy of the signed document shall be handed over to the Master. This document shall be signed after the CTMS and before the cooldown of the arms.

PART 2: SECURITY AND ACCESS TO THE JETTY



1. SECURITY AND ISPS

Security and access control for the LNG port facility is the responsibility of Dunkerque LNG. The normal access to the terminal facilities is via the main entrance. During the call of a LNG Carrier, a Jetty Security Officer shall be present in the Berth House security post, which is located at the main entrance of the Dunkerque LNG Terminal. The Jetty Security Officer shall manage all the in and out traffic, which is necessary for the LNG Carrier except the stores which are by barge only. Therefore, he will register each person that will proceed to go to the jetty.

All persons, vehicles, etc. needing to have access to the LNG Terminal for ship's call, shall be announced by shipping agency at least 1 day before arrival of the LNG Carrier to the Gaz-Opale Security Services by e-mails to:

// ext-security@gazopale.com

Security and access control on board of the LNG Carrier is the Ship Security Officer's (SSO) and Master's responsibility and remains subject to the Master's approval and the ship owner's instructions. Delivery of ship stores should be organized only via barge and shall be supervised and controlled on the jetty by a crewmember appointed by the SSO or the Master. Unattended luggage, packages or any other kind of goods on the jetty platform is not allowed and will be handed over to the authorities.

The Loading Master on duty also acts as the Port Facility Security Officer (PFSO). All questions related to security matters should be addressed to him. He is authorized to sign the "Declaration of Security" and will concur with the Ship Security Officer the additional measures in case ship or terminal is at a security level other than level 1.

At a security level other than level 1, additional security precautions shall be taken in accordance with the ISPS code.

Personnel (officers and crew) leaving and returning to the LNG Carriers shall carry proper personal identification documents and shall only use the Jetty Road and the Port Road. The access to these roads is controlled by the Jetty Security Officer at the main entrance gate. The use of cell phone, naked light, and other non-atex electrical material is not allowed on the jetty platform and the Jetty Road. All this equipment must be switched off.

The security check consists in checking if the persons getting in or out of the Terminal are registered on the updated crew list and/or the list e-mailed by the LNG Carrier or the Shipper Operator's Agent before the arrival of the LNG Carrier to the Terminal (ext-security@gazopale.com). Personnel will be required to sign in or out when entering or exiting the Terminal.

The ship's owner shall, through the Shipping Agency, arrange at its own expense ATEX-compliant shuttle service for at least the first two hours of the call and the last two hours to allow pilots to move between the guard station and the vessel. The ship's owner may, at his discretion, not take a shuttle if there is no crew change or scheduled visits during the call of his ship at the LNG terminal in Dunkirk. Dunkirk LNG will not provide any shuttle service. Personnel access to and from the on-board platform can be done with the ATEX compliant shuttle service or on foot till the north waiting area (see map on the next page).

2. GENERAL

Access to the jetty during the call of a LNG Carrier is allowed under strict conditions.

Vans and cars can be signed up during the call of the LNG Carrier if ATEX regulations are complied with. Only small parcels weighting less than 20kg are authorized to pass through the jetty within the limit of a single shuttle trip per call.



Delivery of stores shall be done by the use of a barge alongside the ship.

As a general rule, no vehicles are allowed during the commercial LNG (un)loading operations on the jetty. Stores and/or delivery activities by barge should be performed preferentially after this commercial operation.

The commencement of the commercial (un)loading operations starts as soon as there is a gas flow through the LNG (un)loading arm (the gas return arm is not considered). The commercial (un)loading operations are finished as soon as all LNG (un)loading arms are drained, inerted (gas free) and disconnected.

3. DEFINITION OF THE AREAS

The following areas have to be considered at the Dunkerque LNG Terminal:

- // **Main Park Area: the parking area in front of the LNG Terminal**
- // **Port road: main external road from the main entrance of the LNG Terminal to the North Waiting Area**
- // **North Waiting Area: the waiting area is located on the external Port Road, at the level of the Lock Area**
- // **Jetty Road (Route de la Jetée): Internal road from the North Waiting Area to the jetty**
- // **Lock Area: the area between the North Waiting Area and the access to the Jetty Road. Several gates are installed to secure (in view of ISPS) the access to the jetty and the process area of the LNG Terminal**

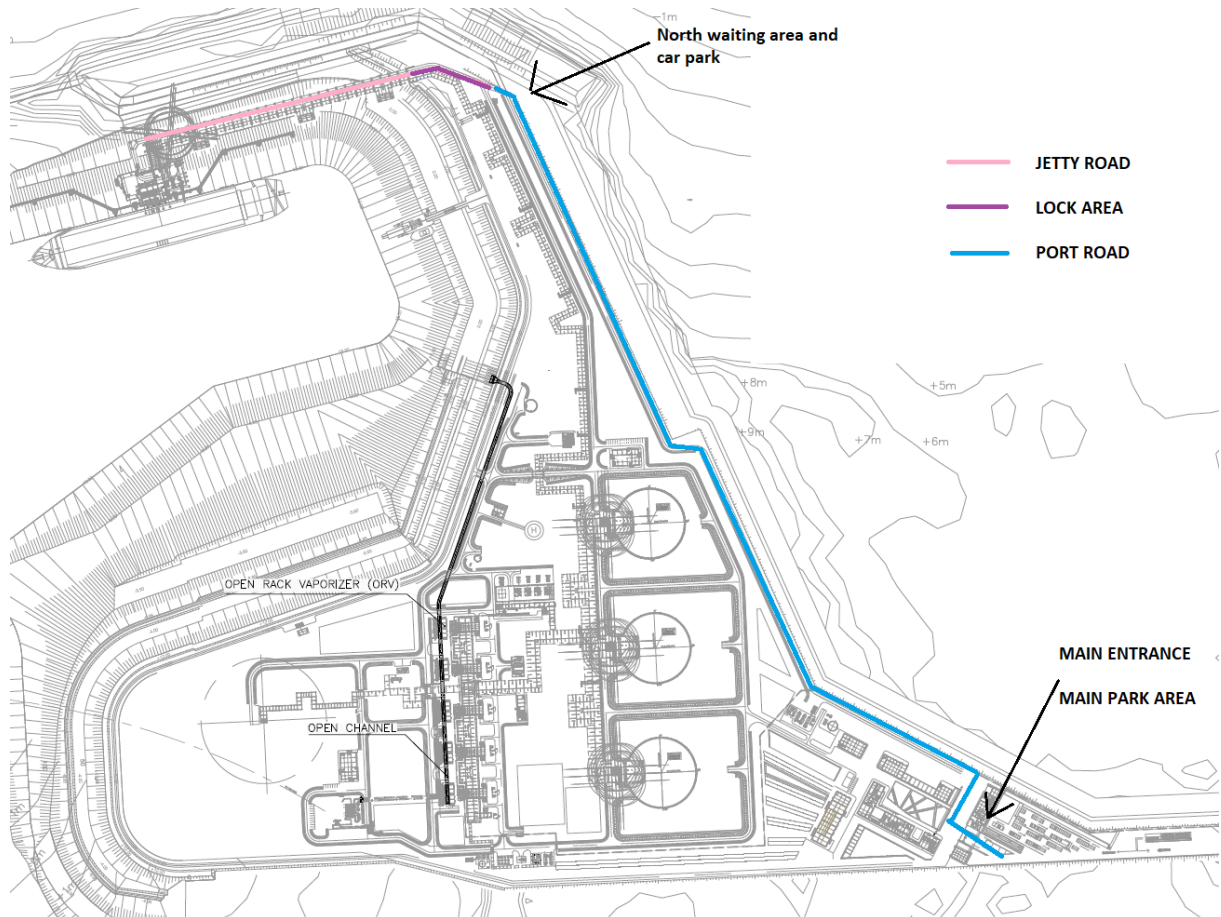


Figure 1: Dunkerque LNG Terminal Areas

4. PREPARATION OF THE ACCESS

Before the arrival of the LNG Carrier, all cars shall be parked in front of the main entrance of the LNG Terminal at the Main Park Area. In the event that a shuttle is provided, car's driver systematically use this means of transport. In the event that there is no shuttle service, all car's drivers can be signed in at the Security Office at the main entrance of the LNG Terminal. Once the LNG Carrier is "all fast", the permission will be given to have access to the north waiting car park and continue on foot till the jetty.

5. ACCESS TO THE JETTY

5.1. General

In the event of shuttle services on the jetty platform, all vehicles shall be parked outside the EX area (ATEX 2). Indications of the EX area are visualized on the road to and on the jetty platform. Cellular phones, naked light and other non-Atex electrical devices need to be switched off.

Vehicles which are not equipped with ATEX 2 precaution measures, shall be subjected to an access permit. Drivers shall be informed of the ATEX 2 area together with the prevention measures at the Security Office by the Jetty Security Officer.



Figure 2: Jetty Platform

5.2. Access to the jetty by shuttle

The shuttle service is not compulsory outside of the first two hours and the last two hours of the call in order to allow the transfer of pilots between the guard station and the ship.

When there is a shuttle, as soon as the LNG Carrier and Loading master have given the sign "all fast" or after the completion of the commercial (un) loading operation, the Jetty Security Officer will give permission to let pass the shuttle to the jetty. The shuttle will take the external Port Road to the jetty. At the Lock Area, the driver shall sign up at the first gate via his badge and all badges of people present inside the shuttle. Driver will continue to the second gate and he will sign up again.

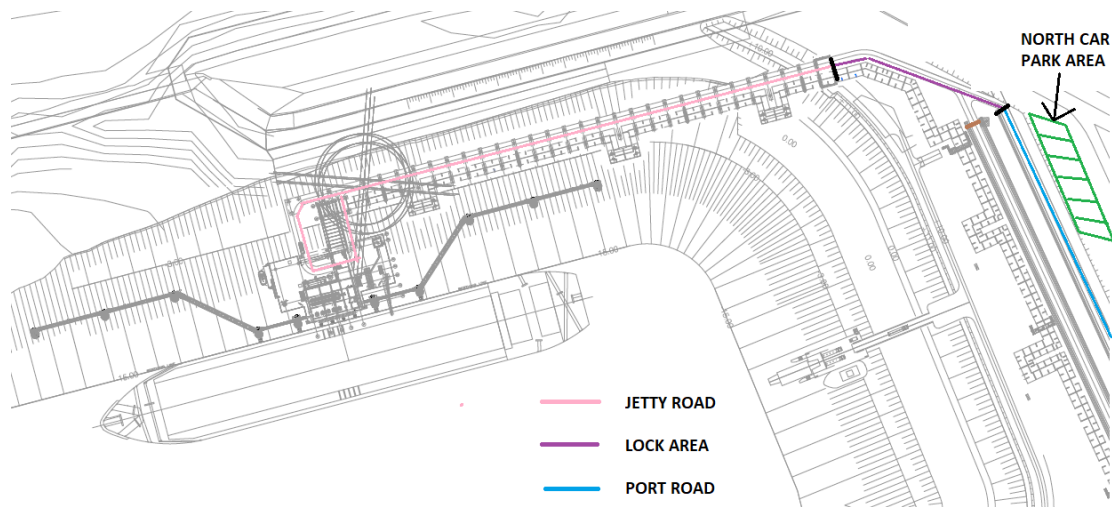
The access control system will be operated by a remote control system.

As soon as the driver passes the second gate and the gate is closed, he continues on the internal Jetty Road to the jetty platform.

The driver shall never leave the shuttle unattended. If documents or a package have to be handed over to the vessel, the driver will first bring its vehicle to the North Waiting Area and walk back to the jetty.

53. Access to the jetty for cars and vans or others when there is no shuttle service

When there is no shuttle service, cars and vans are allowed to take the port road till the north park area.



For the ease of jetty occupation, it is compulsory to park ones car in the North Waiting Area and to continue the way to the jetty by walking. The access to the jetty is under the control of the Shift Supervisor of the LNG Terminal with the cooperation of the Jetty Security Officer.

The Shift Supervisor will manage the jetty occupation. He will give sign to the Jetty Security Officer that the commercial unloading or reloading operations will start. At this step, no vehicles are authorized on the jetty anymore till the end of commercial unloading operations.

6. ALCOHOL AND DRUG POLICY

The management of the LNG Carrier shall have its own alcohol and drugs policy, which will be at least compliant with the ISGOTT and OCIMF guidelines. Nevertheless, at the LNG Terminal, the use of alcohol and drugs are strictly prohibited. Master is advised that operations will cease, if members of the crew, and especially those who are involved into the ship shore operations, are affected by alcohol and/or drugs. Also members of the crew on watch or involved in the performance of any shipboard duty shall not be affected by alcohol or drugs.

If Gaz-Opale notices any abuse of the alcohol and drug policy, the operations will be ceased and will not resume until the matter has been reported to the Master and fully investigated by Gaz-Opale and the Master. Operations shall be resumed as soon as Gaz-Opale has considered it is safe to do so.

Access to any part of the Terminal or jetties for a person or persons suspected affected by alcohol and/or drugs will be denied. The Jetty Security Officer accompanied with Gaz-Opale's member may carry out testing to determine whether personnel are under the influence of alcohol or drugs while at the Terminal. Together, they may decide to deny access to the terminal if a crew member or a visitor appears at the guard station in a state of intoxication with alcohol and/or drugs.

In the event of a crew change, random checks will be carried out by the security post at the main entrance to the terminal. In the event of the discovery of bottles of alcohol in the luggage of the sailors, the captain of the ship will be informed. The captain of the vessel will decide whether these bottles are authorized to go to the ship or not. If not, the bottle will be destroyed.

PART 3: BUNKERING, STORES AND DELIVERIES TO THE LNG CARRIER



1. GENERAL

Specific operations such as technical heel out, bunkering, provisions... could be carried out by the LNG Carrier at the Terminal. Dunkerque LNG may permit such operations in addition to the cargo transfer provided that:

- // A formal request has been made to Dunkerque LNG at least three days before the arrival, and this request has been accepted, and**
- // The forecasted laytime does not exceed the time expected for the (un)loading operation. A laytime extension may be granted by Dunkerque LNG upon preliminary request of the Shipper. The Dunkerque LNG reserves the right to refuse this request.**

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

The LNG Carrier shall perform stores, provisions and bunkering operations at its own risk and expenses and Dunkerque LNG and Gaz-Opale shall not bear any responsibility whatsoever in relation to such stores, provisions and bunkering operations.

Any incident of any kind resulting in death or injury or damage to vessel or port/terminal installations or vehicles or near miss that could have resulted in an incident shall be reported to Dunkerque VTS on VHF 73 and to Gaz-Opale.

No vehicles (van, car...) are allowed on the jetty during commercial operations except the Dunkerque LNG's vehicles and shuttle services when requested.

Same rule is applicable for barges which come alongside the ship for the delivery of stores.

To be allowed to come on the jetty in case of vehicles, or to come alongside the ship in case of a barge, liquid shore arms must be drained, inerted (purged) and disconnected.

Not more than one vehicle (van, car...) will be accepted on the jetty at the same time.

See Part 2 "Security and access", for the access procedure (page 15).

2. POLLUTION PREVENTION

All spill containers fitted around fuel and lubricating oil tank vents, hydraulic or other deck machinery should be empty of water and free of oil. Drain plugs must be in place. Any accumulating water should be removed periodically.

Scuppers are to be plugged during the stay of the vessel alongside the berth.

During bunkering operations, spill equipment shall be provided near the bunker connections for the prompt capture of any spillage on deck.



If no permanent spill container is fitted, a portable drip tray should be placed under the bunkering connection. Gas venting to the atmosphere is only permitted under emergency conditions and during special operations. Soot blowing is strictly forbidden inside harbour limits as well as emitting foul thick smoke and sparks.

Fuel oil transfer is prohibited when the vessel is within the VTS zone (Zone A) and alongside LNG berth.

SOPEP material, such as absorbent pads, absorbent socks granules, disposal bags, gloves, boots and anti-static, are available at the jetty.

3. WASTE MANAGEMENT

The disposal of garbage from ship to shore is possible if it does not delay the vessel's schedule. It should be arranged through the Ship Operator's Agent. Information, for waste disposal, is to be notified before entry into the port of Dunkerque according to the ship's waste form of the GPMD Port Authorities.

Garbage storage facilities are available on request at the jetty for the collection of inert, domestic and hazardous wastes and are located in the Northeast of the jetty platform (face to the gangway).

Garbage handling can also be performed by the use of a barge.

Inert, domestic and hazardous wastes should be correctly identified in accordance with MARPOL and Port regulations. Hazardous wastes shall be labelled and classified, as those wastes, which by quality of their concentration of elements and characteristics (such as inflammable, corrosiveness, reactivity, toxicity, etc.) pose a hazard to human or environmental health and welfare if improperly managed.

Garbage transhipment will be done directly either before or after (un)loading. In no case, any vessel garbage container must be left on the jetty platform.

Liquid waste normally accepted (MARPOL Annex I), such as bilge water, sludge and waste oil, will be collected by barge only. During the discharging operations, spill equipment shall be provided near the deck connection for the prompt removal of any spillage on deck. If no permanent spill container is fitted, portable drip trays should be placed under the deck connection and, if possible, between connection of flexible hoses. The flexible hoses should be drained and blinded before bringing them back to barge.



4. DELIVERIES VIA THE JETTY PLATFORM

Only small parcels weighing less than 20kg are authorized to pass through the jetty within the limit of a single shuttle trip per call.

For safety reasons, parcels, provisions, spares parts (etc,...) cannot be transferred through the jetty or left on the jetty area.

See also Part 2 "Security and Access".(page 15)

5. DELIVERIES BY BARGE ALONGSIDE SHIP

Stores, provisions and spares parts can be taken on board via a barge alongside the LNG Carrier, however, such transfer will not be allowed when cargo operations are taking place. It shall be arranged before or after (un)loading. All arrangements shall be made through the Ship Operator's Agent, without delaying the vessel schedule.

There are two windows that can be scheduled for the delivery of the stores via barge:

- // First window: as from "all fast", till start of the commercial operations, which is around 1,5 hours max.**
- // Second window: after the commercial operations, as soon as all liquid arms are disconnected, no limitation for duration within the slot's window.**

Ship Agency together with ship management will be responsible of the deliveries by barge (see §1. General).

6. BUNKERING

Ships must be fully compliant with MARPOL and ISGOTT requirements.

Bunkering shall be arranged through the Ship Operator's Agent.

Bunker barges are allowed to come alongside the LNG carrier only after completion of the (un)loading operation. Liquid shore arms must be drained and inerted (purged) before bunkering operations start.

The Bunkering Safety Check List must be filled in before starting the bunker transfer

During bunkering, a deck watch on board of the LNG carrier as well as on board of the barge shall be on stand-by at the connection area to check the hose and connection for leaks.

If any oil spills or other incidental pollution occur, the bunkering operation shall be stopped immediately and reported to Dunkerque VTS on VHF 73 and Dunkerque LNG.

Fire-Fighting equipment onboard and on barge should be into position and ready for immediate use.

The bunker hoses shall be drained and blinded before bringing them back to the barge.

It's possible to have deliveries by barge and bunkering simultaneously after captain's agreement (at his own responsibility).

PART 4: PORT AND TERMINAL MARINE INFORMATION



1. GENERAL

The LNG Carrier will be authorized to berth if she is fully able to unload or reload on the time allowed by Dunkerque LNG and if she has received the Terminal Status Notice, which confirms the capability of the Terminal to receive the LNG Carrier.

In case of a major unforeseen situation or incident, which can have an impact on the global harbour activities (ISPS, force majeure...) the GPMD Port Authorities shall have the right to suspend or cease operations and remove any LNG Carrier from berth and shall not be liable to any cost incurred by the LNG Carrier.

LNG Carriers shall have and retain sufficient personnel to, at all times, enable operations to be undertaken safely and efficiently and to maintain immediate and reliable ship/shore communications on operating matters and in emergency situations.

General nautical rules for the LNG Carriers are described into a summarized document, called "Instruction Permanente CDTN°9 Port de DUNKERQUE, , VTS (Procedure for LNG Carrier)".

2. SAFETY AND NAVIGATION

LNG Carriers must keep continuous watch on VHF channel 73 when proceeding in the VTS zone (zone A), when at anchor, and during their stay at the LNG berth. "Dunkerque VTS" may give safety information anytime.

"Dunkerque VTS" on VHF Channel 73 will advise about the movement of the LNG Carrier.

Vessels constrained by her draught (more than 10 meters) or more than 230 meters long are considered as vessel restricted in their ability to manoeuvre. They must exhibit where it can best be seen, three all-round red lights in a vertical line or a cylinder.

When entering in the VTS zone (zone A) LNG Carrier must:

// Stand-by on VHF channel 16 and 73;

// Report any emergency situations, any defects or deficiencies that would affect the safety or the performance of the berthing, mooring and cargo operations and any damage to the environment.

When a LNG Carrier is at anchor, an exclusion zone is established around the LNG Carrier. This exclusion zone has its center on the LNG Carrier with a radius of 0,5 nautical mile into which no traffic is permitted to enter.

Other pilot boarding or disembarking will be operated at least 1 nautical mile off the LNG carrier.

When a LNG Carrier is proceeding in the fairways within the VTS Zone (zone A), it is strictly forbidden for another vessel:

// To follow or to be ahead of the LNG tanker in her traffic line at a distance less than one nautical mile;

// To encounter the LNG tanker in her traffic line;

The possibility for a ship proceeding in the same traffic line to overtake a LNG Carrier is subject to:

- The overtaking vessel can safely go in the other traffic line.
- Once the overtake operation is complete, the overtaking vessel goes back in her normal traffic line, respecting the exclusion distance of one nautical mile ahead of the LNG Carrier.
- Prior to the overtaking, a contact by VHF (channel 73) has been made between both vessels: the overtaking vessel stating her intentions.
- A same contact by VHF (channel 73) has been made to any encounter vessel in the other traffic separation line.

During transiting the fairway and manoeuvring within the Port, the anchors are to be unlashd and ready for letting go. The ship's anchors must be cleared away and ready for use whilst the ship is at the berth, the bow stoppers being placed on the chains with the pins removed.

3. VESSEL TRAFFIC SERVICES

Vessel Traffic Services are provided by "Dunkerque VTS" on VHF channel 73.

LNG Carriers must report to "Dunkerque VTS" (VHF channel 73) and to "Dunkerque Pilots" (VHF channel 72) 2 hours before entering in the VTS area (Zone A).

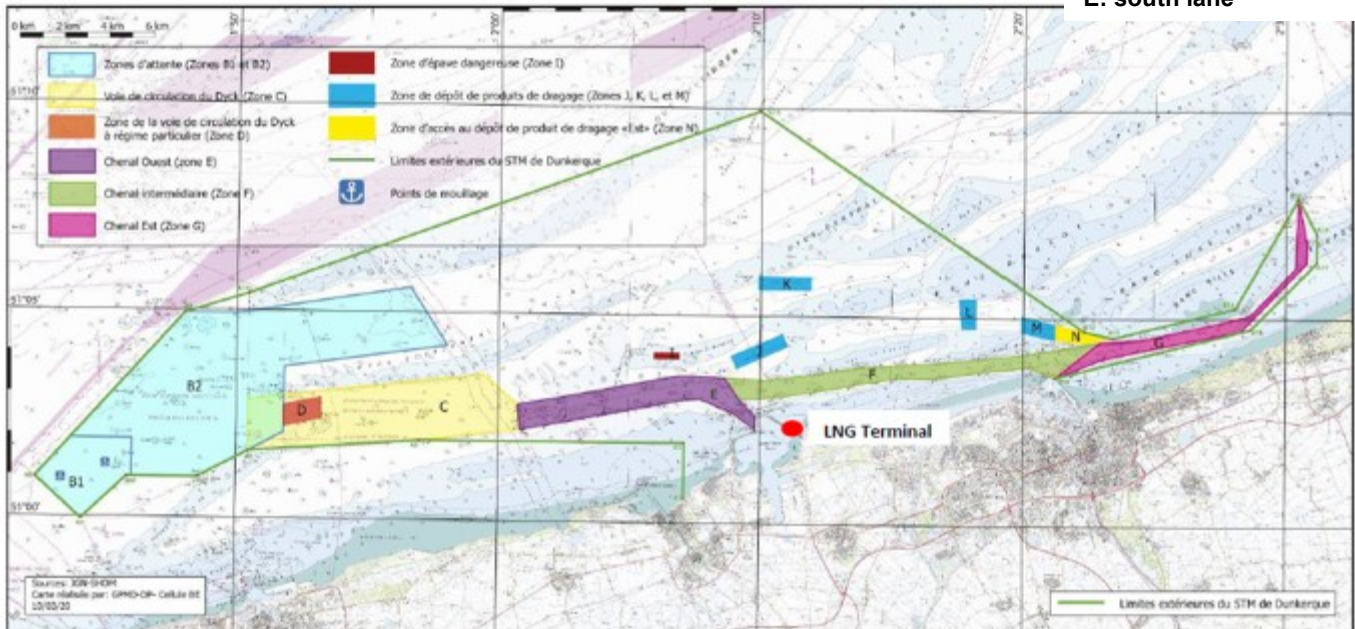
"Dunkerque VTS" will communicate to the LNG Carrier:

- // The anchoring / Transit / Berthing instructions
- // The weather conditions on site
- // Any unusual situation
- // Any buoyage fault

LNG Carrier has to report to "Dunkerque VTS":

- // ETA at the PBS
- // Draught fore and aft
- // Any possible ISPS notification
- // Any emergency situations, defects or deficiencies that would affect the safety or the performance of the berthing, mooring and cargo operations.

B1: Anchorage LNG vessel
B2: Anchorage other ships
E: south lane



4. LNG CARRIER ANCHORAGE AREA

A dedicated anchorage waiting area for LNG Carriers is located at the zone B1. This anchorage waiting area lies within the following coordinates:

Points	Anchoring area for LNG Carrier (B1)		
B1'	50°59,95' N	001°44,10' E	Point A7 zone STM
B2'	51°01,00' N	001°45,84' E	
B3'	51°01,00' N	001°46,1' E	Point B8 Zone attente B2
B4'	51°01,9' N	001°46,1' E	Point B9 Zone attente B2
B5'	51°01,9' N	001°43,7' E	Point B10 Zone attente B2
B6'	51°00,95' N	001°42,32' E	Point A8 zone STM
B1'	50°59,95' N	001°44,10' E	Point A7 zone STM

Inside B1 area, 2 anchor positions are available:

- SW: Lat 51°01,0N / long 001 " 43,8' E
- NE: Lt 51°01,3'N / long 001 " 45,0 E

Master has to call the Pilot Station on VHF (channel 72) to know the exact position where to drop anchor.

When a LNG Carrier is at anchor, an exclusion zone is established around the LNG Carrier. This exclusion zone has its center on the LNG Carrier with a radius of 0,5 nautical mile into which no traffic is permitted to enter.

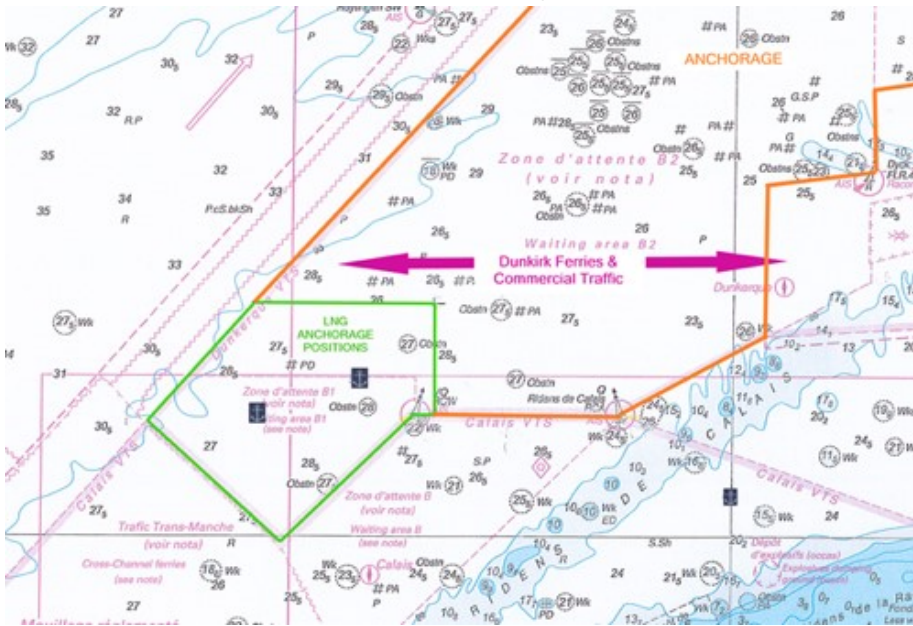


Figure 4: Anchorage Area

Master has to call the Pilot Station on VHF (channel 72) to know the exact position where to drop anchor.

When a LNG Carrier is at anchor, an exclusion zone is established around the LNG Carrier. This exclusion zone has its center on the LNG Carrier with a radius of 0,5 nautical mile into which no traffic is permitted to enter.

When at anchor, the LNG Carrier shall call "Dunkerque VTS" on channel 73 and "Dunkerque Pilot" on channel 72 and communicate anchorage time and LNG Carrier position at anchor.

LNG Carrier must stand by on Channel 16, 73 and 72.

The LNG Carrier position is continuously monitored by "Dunkerque VTS" and "Dunkerque Pilot". The responsibility of the good holding always remains on the Master of the LNG Carrier (See also Part 2 "Security and Access").

5. WEST DREDGE CHANNEL (AREA E)

A traffic separation scheme has been established by the port authorities for the West Dredge Channel:

// The separation between the traffic lanes is the middle of the channel. Vessels shall keep as near to the outer limit of the fairway which lies on her starboard side and keep clear of the separation line. When the vessel is proceeding to the berth the LNG Carrier shall keep the South of the channel. On departure the LNG Carrier shall keep the North of the channel.

// When proceeding in the West Dredge Channel, an exclusion distance is established fore and aft of the LNG Carrier into which no other traffic is permitted to enter. Hence the LNG Carrier's progress will never be immediately impeded by encounters with other traffic. This distance is one nautical mile fore and aft of the LNG Carrier.

// No traffic may encounter the LNG Carrier between buoy DW 13 and the turning basin till the LNG Carrier has reached her berth. All movements within these channels are prohibited during the entry or departure of vessels bound to, or from the LNG terminal.

// The possibility for a ship proceeding in the same traffic line to overtake a LNG Carrier is subject to:

- The overtaking vessel can safely go in the other traffic separation line,
- Once the overtake operation is complete, the vessel goes back in her normal traffic separation line, respecting the exclusion distance of one nautical mile ahead of the LNG Carrier.
- Prior to overtaking the LNG Carrier, a contact by VHF (channel 73) has been made between both LNG Carriers: the overtaking vessel stating her intentions.
- A same contact by VHF (channel 73) has been made to any encounter LNG Carriers in the other traffic separation line.

6. PILOTAGE

LNG Carriers must report to "Dunkerque VTS" on channel 73 and to "Dunkerque Pilots" on channel 72, 2 hours before entering in the VTS area (Zone A).

Pilotage is compulsory for vessels carrying dangerous goods. LNG Carriers normally take two pilots for vessels with a cargo capacity above 65,000 m³.

Two pilots will board the LNG Carrier by helicopter or by tender. Pilot's preference for boarding is by helicopter. The use of the helicopter shall be decided by the pilot at least 2 hrs before piloting.

Pilots' services are available and recommended for LNG Carriers that want to go to anchor (get in touch with Dunkerque Pilot on channel 72).

When a pilot ladder is used combined with an accommodation ladder, it must be properly secured to the ship side to ensure safe boarding and disembarking operations when the ship is rolling. Refer to 'Pilot Boarding Facilities' as per IMO requirements and IMPA recommendations.

At the request of the Master, Pilots can board the LNG Carrier at anchorage (weather permitting).

Pilot boarding station (PBS) is located about 2.5 nautical miles in the West by south of the buoy Dyck.

// On arrival, there are tidal restrictions on periods around high tide (two hours before to one hour after) and around low tide (one hour before to one hour after). LNG Carriers coming from North Sea have the possibility to board the Pilot in the downstream traffic lane of the Traffic Separation Scheme between buoys F1 and MPC. Pilot will preferably board by helicopter.

// On departure, no tide restriction, LNG Carriers bound to North Sea have the possibility to disembark the Pilot 1 mile in the East of buoy Ruytingen North, or in the upstream traffic lane of the Traffic Separation Scheme by the buoy Sandettie North. Pilot will preferably disembark by helicopter.

7. MOORING PROCEDURE

Ships must be fully compliant with OCIMF publications which provide information about all aspects of mooring equipment and operations (Effective mooring, Mooring Equipment Guidelines, Anchoring systems and Procedures and Guidelines on the use of High Modulus Fiber Rope).

The mooring lines of the LNG Carrier shall be in good condition and mooring shall be carried out safely and promptly under the instructions and responsibility of ship's Master assisted by the Pilots.

The master has the responsibility to ensure that the vessel is securely moored with due regard to the weather forecast and he should not hesitate to increase the number of moorings should he feel it is prudent to do so.

The mooring plan is based on a study, in advance of the vessel's call, carried out jointly between the shipowner and the terminal operator. This mooring plan shall, as far as possible, include the use of piles 4 and 7 for mooring lines connected on the breasting dolphins and ensure that the distribution of moorings, forward and aft, is even and with reasonable lengths of the mooring lines.

Port services and/or authorities may request the Terminal Operator to transmit the lengths of the mooring lines (from the winch of the ship till the mooring hooks at the jetty).

This berthing plan will be communicated by the terminal operator to the shipowner, port services and authority, in particular for the «Ship Shore interface Meeting».

Any modification of the mooring plan must be the subject of a common exchange between the operator of the vessel, operator of the LNG terminal, the port authority and the port services concerned (Harbor master, Pilots, Towing and mooring teams).

This previously validated mooring plan must be respected as far as possible and remains, in all cases, the responsibility of the master of the vessel.

Any event related to moorings, which would occur during the call, must be the subject of information to the same services (need for additional mooring lines, mooring replacement, ...) indicating the causes of these events.

It is reminded that, by decree, it is forbidden for anyone other than the crew of a ship or mooring services, to manoeuvre the mooring lines of a vessel without having received the order or authorization of the harbour authority (Decree 2009-877).

Nevertheless, in case of an accident, before or during the manoeuvre, of any equipment related to the mooring (on the ship or on the jetty), the mooring arrangement can be adapted according to the circumstances (material or weather) and in agreement with the master of the vessel and the advice of the pilot.

Unless otherwise informed previously by the terminal, all the hooks of the different dolphins must be operational and available to be used for docking and mooring.

In case the mooring plan could not be respected during the mooring, the mooring service, before leaving the site, will inform the «Loading Master», about the changes. Communication will be via VHF on channel 6, once the ship is fully moored.

Once on board, the «Loading Master» will modify the present mooring arrangement plan and with the captain, sign the new configuration set up after the unforeseen event.

The amended and signed plan specific to the current call will then be scanned and sent by email before the departure of the vessel to the port services concerned.

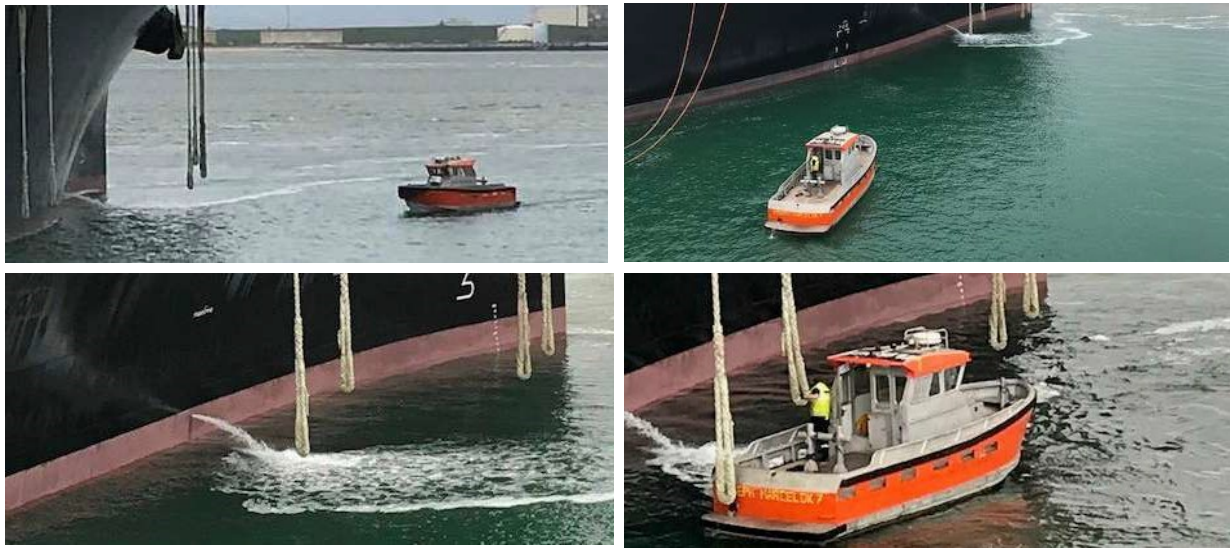
During the mooring operation it is recommended to keep a free distance of at least 20 meters between the berth and the hull of the ship, in order to allow the mooring linesmen to safely handle the springs and this until all springs are hooked up to the mooring dolphins of the jetty platform.

All mooring lines will be taken by the mooring boat. If the master of the vessel authorizes it as well as the equipment on board, the mooring lines can be taken two at a time.

Nevertheless, only the mooring crew on the spot, according to the conditions of the moment, will indicate to the crew of the vessel, the taking of one or two mooring lines at the same time.

In order to anticipate manoeuvres, all mooring lines must be prepared and visible. The lines will be lowered 2 meters above the water to facilitate their catch.

Except for the master of the vessel/pilots 's counter order, moorings will be taken in the logical order: springs, breast and finally head or stern line.



In order to guarantee the safety of crew member of mooring boats, the use of forward and aft bow thrusters (especially in the case of azipods) must be notified in advance by pilot

The ship will be positioned after passing two spring lines each forward and aft. It is recommended that springs should not be hauled in again, as far as possible, after vessel is made all fast.

The spotting line gives to the ship the right berthing position.

During this time, other lines should be passed but should not be tightened.

For the safety of the linesmen it is recommended to postpone the tightening of the lines on one particular dolphin (Breast lines) until all lines are passed to that dolphin.

In case the mooring lines cannot be attached simultaneously onto one dolphin, the first mooring lines must be sufficiently fixed, without being stretched totally, so as not to hinder the manoeuvres of the mooring boat.

The indication of the possibility for the crew of the ship to definitively settle is given by the mooring crew present on the mooring dolphin when they estimate that their safety and that of the crew of the boat are guaranteed.

All mooring lines shall be steel wire or HMPE fiber rope with a synthetic tail. In view of their optimum elasticity, it is recommended for all type of vessels synthetic tails in polyester, polypropylene or polyamide of 11 meters long, except for Q-Max & Q-Flex vessels which recommended tails length is 22 meters (11 meters long for Q-Flex is accepted too).

All mooring lines shall be made fast on drums or split drums on board the LNG Carrier. Fixed points such as mooring bits are not allowed.

All powered mooring lines must be secured on brakes and winches out of gear. No automatic line tensioning.

Aft and forward fire wire on sea side will be lowered 4 meters above the water to facilitate their catch in case of necessity.

It is possible not to put the fire wires if the vessel is equipped with a tug bit integrated directly in the hull structure but only after agreement of the tug company upon special request 48h before the arrival.

The LNG unloading arms should be in standby position during manoeuvring. Maintenance position for unloading arms is strictly forbidden during the mooring of the ship.

A Berth Aided Monitoring system is installed on the jetty, to assist the ship during the manoeuvring. Berthing approach speed and distances, forward and aft between ship and shore shall be displayed.



In addition, seawater temperature, visibility sensor, current details (direction and velocity), wind details (direction and wind speed), ambient temperature and barometric pressure shall also be available in the jetty control room of the Terminal. Furthermore, tension of the mooring lines shall be monitored continuously and all data shall be stored for reporting. In case of low or high tension triggering an alarm of the mooring lines, the situation shall be promptly communicated to the Cargo Control room of the vessel. Ship Operator shall act accordingly.

During the LNG Carriers stay alongside, the fire wires should be positioned on the offshore bow and quarter except if the presence of sunken bits. Before, the master of the LNG carrier will have asked for a written authorization to the towing company in order to know whether or not he will be required to put the fire wire.

In case there are spring lines on dolphin n°5 and n°6, in order to facilitate the release and to prevent the mooring lines from getting caught on the fenders, the pilot will move the ship sideways so that the spring lines are clear of the fenders .

In the event of an electrical problem with the drop boxes or a mechanical problem with the hooks, after reporting to the pilot, the linemen can call the control room. As the loading master is not present at the departure of the ship and mobile phones are prohibited, the linemen can call the control room via a phone located in front of the fire pump (West side of the wharf) and by dialling 3005, they will join directly at the control room.

The maximum allowable approach speed is 0,18 m/s with 10° maximum angle with the berth line.

Preferably and for safety reasons in case of emergency, the ship shall be berthed starboard side. If the shore gangway cannot be used because of technical obstructions, Portside berthing is also allowed.

8. INSTALLATION AND REMOVAL OF THE GANGWAY

During the installation and removal of the gangway, a Ship Operator must be present on the Ship deck near the gangway landing area in order to ensure the monitoring, coordination and the control of the operation. Only one Ship Operator shall give instruction to the stevedore for this operation. No other people than Ship Operator are allowed to give instructions to the stevedore for installation or removal of the gangway.

In case of unavailability of the gangway and after the agreement of the captain of the ship, it will be possible to embark or disembark using the accommodation ladder located on the sea side. In this case, a boat will be made available at the start and at the end of the call in order to allow staff movements

9. WEATHER RESTRICTIONS

The wind speed will be the average of speeds recorded during an interval of 10 minutes and measured at 10 meters above ground level on site.

Berthing will be postponed if the wind speed is higher than:

// From North-West to North-East wind: 13 m/s or 25 knots (6 Beaufort)

// All other directions: 15 m/s or 30 knots (7 Beaufort)

Unberthing will be postponed if the wind speed is more than:

// For all directions: 15 m/s or 30 knots (7 Beaufort)

However, in case of higher wind speed, the Master of the LNG Carrier can ask for additional assistance (1 or more tugs) if necessary.

For weather restrictions which are applicable when the LNG Carrier is moored alongside the berth, see Part 5 «LNG Operational and Organisational process ».(page 30)

Berthing and unberthing will be postponed if the visibility is less than 500 meters. The decision for berthing or unberthing will be taken by the Master of the ship, assisted by the pilots.

10. TUGS

Tugs lines are used during normal towing operations.

LNG Carrier must be equipped to fasten at least four tugboats to the deck. The towing lines used will always be ropes supplied by the tugboats. One or more tugboats must be equipped with fire-fighting equipment.

In the event of simultaneous arrival of ships, strict measures regarding order and time of entry will be applied.

During the LNG Carriers stay alongside, the fire wires should be positioned on the offshore bow and quarter except if the presence of sunken bits. Before his arrival, the master of the LNG carrier will have asked for a written authorization to the towing company in order to know whether or not he will be required to put the fire wire.

10.1. Berthing

At least 4 tugs with a total bollard pull of 220 tons will be used for berthing operations. A combination of 2 x 70T and 2 x 40T as a minimum shall be applied.

// One escort tug will be tethered before buoy DW5

// One tug will fasten the forward central lead before buoy DW 15

// The other two tugs arrangement should be determined between the Pilot and the ship's Master, based on the conditions at the time.

For vessels with very good manoeuvrability (Arc7 or others), at least 3 tugs with a total bollard pull of 210 tons could be used for berthing operations under certain conditions :

// Harbour master's office / piloting / towing agreement at least 24 hours before the entry manoeuvre -

// Less than 15 knots of wind in all sectors

// Vessel equipped with 3 pods in good working order and separable.

10.2. Unberthing

Three or four tugs will be used, depending on the agreement between the captain and chief pilot for unberthing operations with at least one tug equipped with a bollard pull of 70 tons.

// The towing line of the escort tug will be cast off on passing buoy DW6

// The other tugs arrangement should be determined between the Pilot and the ship's Master, based on the conditions at the time.

10.3. Stand-by tug

A dedicated tug, type FiFi 1 and class 70 tons is placed on standby in close proximity to the LNG berth during all the stay of the LNG Carrier alongside the berth.

This tug could be used on master of the ship's request in case of emergency or mooring issue during the call. For that, the master of the ship has to call the harbour authorities via VHF channel 73 to alert them and inform pilot station on the channel 72.

11. EMERGENCY ESCAPE

While the LNG Carrier is staying alongside the LNG berth, the LNG Carrier offshore gangway shall be rigged or positioned on the outboard side of the vessel, ready for immediate lowering in the event of an emergency. The offshore lifeboat, if fitted, shall be lowered to embarkation level and be also ready for immediate use at all times.

For emergency precautions, and in the event of an emergency, the Master shall act in accordance with the relevant Terminal procedures and those agreed in the Ship Shore Safety Plan and during the pre-loading / pre-unloading meeting.

12. POLLUTION PREVENTION

Gas venting to the atmosphere is only permitted under emergency conditions and special operations.

Soot blowing is strictly forbidden within port limits as well as to emit foul thick smoke and sparks.

Fuel Oil transfer between vessel tanks is prohibited when LNG Carrier is within port limits.

Gas burning is allowed during (un)loading operation. A gas burning certificate should be established and signed after CTMS taking into account the quantity burned during operation.

Scuppers are to be plugged during all the LNG Carrier stay alongside berth.

During bunkering operations, spill equipment shall be provided near the bunker connections for the prompt removal of any spillage on deck.

See also Part 3 "Bunkering, Stores and Deliveries". (page 17)

13. BUNKERING

See Part 3 "Bunkering, Stores and Deliveries". (page 17)

14. GARBAGE AND LIQUID WASTE

See Part 3 "Bunkering, Stores and Deliveries". (page 17)

15. MAIN ENGINES

Any repair or maintenance work (either cold or hot) which would impair the safety of the cargo operations or the manoeuvrability of the LNG Carrier are strictly prohibited during the commercial operation.

In case of necessity the Master can announce a repair that can be done before or after the commercial operation, on agreement with the GPMD Port Authorities and the LNG Terminal.

The main engines shall always be kept ready for use within the shortest possible notice.

In case of breakdowns that affect the LNG Carrier's readiness to manoeuvre, Dunkerque Port Authorities may agree to allow emergency repairs to be carried out on the condition that the LNG Carrier undertakes adequate safety and precautionary measures.

16. ISPS

ISPS information is to be notified before entry into the port of Dunkerque according to the ship's ISPS information form of the GPMD Port Authorities. This notice shall be sent by e-mail to matdanger@portdedunkerque.fr or via the Ship Operator's Agent as soon as possible and not less than 24 hours before arrival at the Pilot Boarding Station.

17. FIRE PREVENTION

The overboard water spray curtain must be in use before the connection of shore arms. It will be stopped after complete disconnection of shore arms.

The Ship's water-spray system must be pressurized at all times, or capable of being pressurized at short notice.

The Ship's main fire system must be pressurized at all times.

All fire hoses fitted with jet / fog nozzles available on cargo deck area and manifold area are to be connected to the Ship's fire main system and ready for immediate use.

A SOLAS International Shore Fire Connection will be available on shore.

Dry powder flexible hoses and dry powder monitors must be ready for immediate use.

Smoking on board the Ship is only authorized in the designated areas agreed during the preliminary meeting.

18. LEAKS AND SPILLAGE PREVENTION

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

In the event of any leakage at the LNG Carrier's manifold, cargo operations must be stopped immediately and the cause of the leakage investigated. LNG transfer operations shall not resume until the situation is fully rectified.

On shore, there is a dedicated room located in the Northwest of the jetty platform, filled with absorbents and material to be used in the event of spreading or leaking.

Report to Part 6 "Safety Aspects".(Page 39)



19. ELECTRICAL EQUIPMENT

The use of mobile phones and pagers is prohibited within the Terminal area and the Ship's hazardous area, unless of an approved type. Non-approved types must be switched off.

20. LIFEBOAT DRILLS

Lifeboat drills may be carried out with the approval from the Dunkerque VTS and from the Ship Supervisor. Such safety drills and exercises shall not be undertaken during cargo operations.

Dunkerque VTS shall be informed on VHF 73 at the beginning and at the completion of the lifeboat drills.

PART 5: LNG OPERATIONAL AND ORGANISATIONAL PROCESS



1. INTRODUCTION

This Part describes the way in which Gaz-Opale operates the (un)loading process. It will also explain the internal organization and the responsibilities during the process.

In addition, more technical information shall be given on equipment's, which are involved during the process, such as capacity of the boil-off process, data about the unloading arms, ...

2. ORGANISATION OF GAZ-OPALE

For the LNG Terminal, the LNG transfer operations are controlled and supervised by the following organisation:

2.1. Ship shore team

The Ship shore team will organize the future call of the vessel with the following tasks:

- // Assume the compatibility study between terminal and vessel with the vessel operator till the validation for 3 years of the vessel for Dunkirk's terminal.**
- // Organize the interface ship shore meeting with the port authorities, vessel operator and captain of the vessel if it's the first call of the vessel at Dunkirk. In case a sister ship already called at the Dunkirk LNG terminal, it is not necessary to redo an interface ship shore meeting.**
- // Maintain the communication between the terminal and the vessel till the arrival of the vessel at the pilot boarding station.**
- // Prepare the call for the loading master.**

2.2. Loading Master

The Loading Master on duty will execute the following tasks:

- // Conduct the preliminary safety meeting on board of the ship together with the Master or the chief officer**
- // Perform the safety round tour on board**
- // Fill in, discuss and sign the ship-shore safety checklist**
- // Conduct, together with the chief officer the ESD tests (signal test...)**
- // Follow up the arms cool-down and ramp-up operations.**
- // Be present in the Ship Cargo Control Room (CCR) at all times during the arms cool-down and ramp-up operation. After a stable unloading/reloading flow and a stable vapor control flow, the Loading Master will leave the Ship Cargo Control Room and hand over the follow-up of the operation to the Shift Supervisor**
- // Attend to the opening and closing of the CTMS**
- // Establish the quality and quantity certificate at the end of the unloading/reloading operation and conduct the unloading/reloading debriefing.**
- // Conduct the Closing meeting report to the Master or chief officer**

The Loading Masters' main location will be in the Ship Cargo Control Room



23. Shift Supervisor

The Shift Supervisor will execute the following tasks:

- // Assist during the ship placement**
- // Connect the unloading arms to the manifold.**
- // Participate during the ESD test (signal test, ESD manifold test,...) at the manifold platform**
- // Supervise the cool-down of the unloading arms on the manifold platform**
- // Give instructions to the Ship Gas Engineer in charge for increase or decrease the speed of cool-down of the arms by opening or closing the cool-down valves of the manifold**
- // Supervise the whole unloading/reloading operation. Supervision shall be done on shore side. However, during the operation, repetitive checks shall be performed (following the Safety Checklist) on board of the ship**
- // Perform the drainage, inerting and disconnection of the unloading arms at the end of the unloading/reloading operation, with the assistance of the Ship Gas Engineer in charge.**

The Shift Supervisor's main location will be at the manifold platform on board of the ship for the start-up and the end of operation (in between, on site).

24. Jetty and Panel Operators

The Jetty Field Operator will assist the Shift Supervisor during the complete unloading/reloading procedure. He will be at the jetty platform and in the Jetty Control Room.

A Panel Operator will be in the main control room of the Terminal during commercial operations. Together with the Shift Supervisor and the Jetty Field Operator, they will follow-up the whole unloading/reloading operation.

This team will be in contact by using the following communication means:

- // Walkie talkies on a dedicated frequency (Operation Channel)**
- // Telephone communication between the Main Control Room and the Jetty Control Room**

25. Miscellaneous

In addition, a technical staff is on call. In case of urgent technical repair, Gaz-Opale can call this staff.

During these operations, the language used in the ship-shore communication is ENGLISH.

3. OPERATIONAL STEPS

3.1. Preparation before operation

Before receiving the LNG carrier at Dunkirk, all commercial operations planned for this call must be clearly specified by the ship's charterer or by the captain of the vessel to the terminal operator. The LNG in the vessel's tank must comply with the specifications required in the contract for both the quality of the LNG and the quality of the vapor gases in its tanks if the vessel arrives empty and / or in hot conditions.

During the mooring manoeuvre, Gaz-Opale will be standby at the jetty to supervise the operation. At the completion of the mooring operation, the Master or Pilot will take contact with the Terminal to confirm the completion of the mooring manoeuvre through the "ALL FAST" message and that, as far as he is concerned, the gangway can be put safely on board the ship, meaning that the "LNG carrier is ready to receive shore gangway".

Furthermore, mooring hooks need to be locked, and Instrumentation cable shall be connected.

The Loading Master shall proceed to the Ship Cargo Control Room, while the Shift Supervisor will proceed to the manifold platform. During the preliminary meeting, operations shall be discussed and some formal issues shall be treated. After everything is cleared a Ready To Discharge/Reload notice shall be given.

3.2. Special operations

It is possible to request Terminal for special operations like inerting, gassing up and tanks cooling down of the vessel. All special operations planned for this call must be clearly specified by the customer to the Dunkerque LNG commercial department. In case of tanks cooling down request only, the vessel should justify of the quality of the tanks' s atmosphere to ensure absence of risk for the terminal's equipment. The Dunkerque LNG commercial department reserves the right to refuse this request.

3.3. Unloading/Reloading Operation

3.3.1. Cool-down of the unloading arms

Before the arrival of the LNG Carrier at the jetty, it is recommended that the deck piping is cooled and drained. In this case, before the start of the operations and once all arms are connected, the LNG, delivered by the spray pumps of the ship, is used for the cool-down of the unloading arms. Therefore the ship's main manifolds are closed and the bypasses are used to provide a small and controllable flow of LNG towards each transfer arm.

In case the deck piping is not yet cold, the LNG, delivered by the spray pumps of the ship shall also be used for the cool-down of the deck piping.

If the heel of the cargo tanks of the ship is not sufficient to start the spray pumps for the cool-down of the deck piping and unloading arms a small flow of LNG, delivered by the Terminal, will be used for the cool-down of the transfer arms and the deck piping of the ship. This small LNG flow is branched off from the cold circulation of the LNG Terminal transfer lines. In that case, the Ship Officer in charge shall control the cool-down process of its installation.

During the cool-down, the Shift Supervisor will be in the vicinity of the unloading arms and on the manifold platform to follow- up the progress of the arms cool-down. The Shift Supervisor shall give instructions to the Ship Officer in charge to increase or decrease the cool-down rate of the unloading arms. The duration of the arms cool-down operation is about 45 min to 1 hour for all arms.

Unless recent liquefaction plant start-up or maintenance, vessel dry docking and/or maintenance to cargo systems, it is considered as accepted practice and requested to fit strainers with a mesh size no finer than ASTM 60 (i.e. nominal aperture 0,25 mm) in the transfer lines at the vessel's manifold. Otherwise, for the above-mentioned periods when general contamination is more likely, finer mesh strainers up to ASTM 200 mesh (i.e. nominal aperture 0,074 mm) shall be used. These strainers are provided by the vessel.

In the extended piping from each LNG transfer arm, a strainer with a mesh size of 60 mesh is installed.

3.3.2. Ramp-up of the unloading/reloading flow

During unloading operations, the Ship Operator shall use their ramp-up plan, which is discussed during the pre-discharge meeting with the Loading Master. Ship Operator will inform Loading Master by each start-up of a transfer pump. For Dunkerque LNG Terminal, It is a common practice to wait ten (10) minutes before starting transfer pump n°2 and n°3 and then, continue the ramp-up with the vessel plan. During the ramp-up operation, the Loading Master shall be in the Ship Cargo Control Room.

For the ramp-up of the reloading flow, Dunkerque LNG shall use his ramp-up plan, which is discussed during the pre-discharge meeting with the Ship Operator. Dunkerque LNG will inform the Ship Operator each time when an increase of the reloading flow will occur.



3.4. Vapor pressure control

The Loading Master will observe the ramp-up and special attention will be given to the vapor pressure. Ship Operator shall control the vapor pressure of the cargo tanks by the use of the Ship vapor control valve and/or blowers of the ship. Vapour flow of the LNG Terminal is a free flow configuration.

The average LNG cargo temperature at the LNG Terminal of Dunkerque should be at or below the liquid temperature in equilibrium with a calculated saturated vapor pressure of 1163 mbara (absolute pressure) The equilibrium vapor pressure will be calculated based on the LNG temperature and the LNG molar composition at the delivery point.

Vapor pressure exceeding more than 150 mbarg above the normal atmospheric pressure can lead to a flare event. Flare events shall lead to the draft of a letter of protest.

3.4.1. Unloading operation

For unloading operations, a part of BOG leaving the LNG Terminal storage tanks shall be sent back to the LNG Carrier to keep a constant pressure in the Ship cargo tanks. A free flow vapor return mode will be established during the unloading operation, by means of pressure difference between the LNG Terminal storage tanks and Ship cargo tanks. The terminal boil-off system is allowed to rise at a maximum of 250 mbarg. To maintain a steady and optimal BOG flow between the LNG Terminal storage tanks and the LNG Carrier cargo tanks, the pressure difference must be at least of 50 mbarg, meaning that the pressure in the LNG storage tanks shall be 50 mbarg higher than the ship's cargo tanks.

BOG compressors shall handle the part of the BOG of the LNG Terminal. During normal unloading mode, two BOG compressors shall be running in automatic regulation and one shall be in stand-by. BOG compressors shall be used to send the excess of BOG to the LNG recondenser.

The control of the vapor pressure of the Ship cargo tanks must be performed by the Ship Operator. There is no control valve in the onshore vapor return line to control the vapor pressure arriving at the ship.

3.4.2. Reloading operation

For reloading operations and in order to achieve the required reloading rate, the Master may use its best efforts to:

- // Upon the start of the reloading operation, the cargo pressure of the LNG Carrier shall be higher or equal to 1,130 mbara.; and**
- // the temperature of the gas return measured at the manifold shall be lower than -90°C, and**
- // After the end of the ramp-up period and for the remaining of the reloading operation, the cargo tank pressure shall meet the following specifications depending on the temperature of the gas return, measured at the manifold. If this temperature is:**
 - lower than -110°C, the cargo tank pressure shall be higher or equal to 1,130 mbara**
 - between -90 °C and -110 °C, the cargo tank pressure shall be higher or equal to 1,140 mbara**
 - higher than -90 °C, the cargo tank pressure shall be higher or equal to 1,150 mbara.**

The blower on board of the LNG ship shall be used to control the vapor flow from ship to terminal with the aim to control the pressure between ship and shore.

Gas burning is allowed during (un)loading operation. A gas burning certificate should be established and signed after CTMS taking into account the quantity burned during operation.

3.5. Full Unloading/Reloading Rate

The Loading Master will stay on board until all process parameters are steady and stable, such as the unloading/reloading flow rate and pressure. During the full rate transfer, a pressure of, at least, 3,5 barg at the manifold shall be maintained.

During the unloading/reloading of the LNG at full rate, the Ship Operator shall be in continuous contact with the Terminal Panel Operator via radio. Ship Operator shall inform the Terminal Panel Operator in case of the following events:

- // Change in the pressure**
- // Unstable flow Rate**
- // Movement of the ship**
- // Incidents, which have an impact on the safety or operation**

The Shift Supervisor shall execute some repetitive checks on board. The frequency of those checks shall be determined during the preliminary meeting on board. But, as a standard it will be every 4 hours

3.6. End of the Unloading / Reloading

One hour before the start of the ramp-down of the unloading/reloading rate, Ship Operator shall inform the Terminal Main Control Room.

During the ramp-down, Ship Operator shall inform by radio the Terminal Main Control Room in advance when a transfer pump will be stopped, in order to control the operations of the terminal.

For reloading operations, the Ship Operator shall inform by radio the Terminal Main Control Room to start the ramp-down. The Shift Supervisor shall follow the ramp-down procedures which have been agreed upon the preliminary meeting.

3.7. Departure of the LNG Carrier

At the end of the unloading/reloading operations, the Loading Master will come on board together with the Shift Supervisor. The Shift Supervisor shall take care of the disconnection of the unloading arms assisted by the Jetty Field Operator.

Before disconnection of the unloading arms, the manifold and the unloading arms will be drained and then purged by using a nitrogen flow from the LNG Terminal. After the draining of the lines, more nitrogen will be injected to inert the system.

For both operations the nitrogen will be injected at the top of each unloading arm.

Before disconnection of the unloading arms, the Ship Gas Engineer, in cooperation with the Shift Supervisor will perform a check to ensure that the lines are empty and inert. After confirmation and approval of the Ship Operator, the unloading arms will be disconnected by the Shift Supervisor.

In some cases the gas-return arm needs to remain connected because additional works need to be performed on board of the ship, for example: bunkering operations, inspections that only can be done after the completion of the commercial unloading/ reloading..

The Loading Master shall perform the "Closing meeting". He shall also hand over the cargo documents related to the unloading/ reloading operation to the Master or the chief officer.

As soon as all arms, liquid and gaseous, are disconnected and parked and all administrative work is done, the ship is cleared for departure. Therefore the Loading Master will notify to the Master that the shore gangway can be retrieved, meaning that the LNG Terminal has finished all operational tasks for the LNG transfer operation. At this point, the instrumentation cable shall be disconnected, the gangway shall be removed from the LNG Carrier and the mooring hooks shall be released when pilots are on board.

During the departure manoeuvre, the Shift Supervisor or Field Operator will be standby at the jetty for the follow-up.



4. UNLOADING/RELOADING FEATURES

4.1 LNG and Gas-return Arms

Four unloading liquid arms (DN500, 20") are installed at the jetty

// Only 3 out of 4 arms shall be used for LNG unloading transfer in normal mode. The fourth one being a standing spare ready for immediate use, except for the maximum capacity LNG carriers (Q-max or other) when four arms shall be used to unload;

// For fast reloading operations, 3 liquid arms shall be connected together with the gas return arm.

One gas-return arm (DN500, 20"), which is installed in the middle of the four unloading arms, shall handle the vapour flow between the LNG Terminal storage tanks and the Ship cargo tanks during the transfer. The gas-return arm is designed to allow a flow of 14000 (n)m³/h of natural gas. This equipment shall allow the following flow rates:

// Unloading rate

- 12,000 m³ LNG/h (3 x 4,000 m³ /h) with three liquid arms operational

- 14,000 m³ LNG/h (4 x 3,500 m³ /h) with four liquid arms operational

// Reloading rate

- Up to 8,800 m³ LNG/h with three liquid arms operational – Minimum Requirement: 7,700 m³ LNG/h

The specifications of the unloading arms are detailed in the table here below:

	LNG arm	Vapor arm	Unit
Rated flow rate (per arm)	4,000 m ³ /h	14,000 (n)m ³ /h	m ³ /h
Flange Diameter	16"	16"	inches
Design Temperature Min / Max	-196 / 45	-196 / 45	°C
Design Pressure	13,9	13,9	barg
Operating Temperature	-160	-160	°C
Operating Discharge Pressure Min / Max	2,5 / 5,5	2,5 / 5,5	barg

In case the gas-return arm is not available, one of the LNG unloading arms (arm C) can be converted to gas-return arm.

After connection to the LNG Carrier's flange, with the hydraulic control in neutral, the arm is free to follow the normal movements of a properly moored LNG Carrier at berth, within pre-set alarm limits. An over-extension alarm system is included to provide audio-visual means of warning when the arms are approaching their maximum allowable reach for both drift and slewing.

Each arm is equipped with an Emergency Release System (ERS). The ERS consists of two isolation ball valves and a powered emergency release coupler (PERC) located between these valves.

4.2 BOG handling system

Four low pressure BOG compressors and 1 pipeline compressor are installed for the BOG handling with the following design parameters:

// Low pressure compressors -> Design flow: 5,829 (n)m³/hr up to 9,240 (n)m³/hr

// pipe-line compressor -> Design flow: 1,960 (n)m³/ hr

4.3. Unloading/reloading system.

A 44" unloading/reloading line is installed to transfer the unloading flow to the three LNG storage tanks. In addition, the recirculation line of 8" shall also be used as an unloading/reloading line and is connected with the three LNG Terminal tanks. Each tank is equipped with a top and bottom filling line. Depending of the density of the LNG that shall be discharged, a bottom or top filling strategy shall be used to avoid stratification of the LNG within the LNG Terminal Tanks. Other equipment is installed to detect stratification and overfilling of the LNG Tanks.

For reloading operation, the in-tank pumps of the LNG storage tanks shall be used for the reloading of LNG and the unloading line shall be used as loading line.

Design flow of the in-tank pumps for tank 1 & 2 is: 1,100 m³ LNG/h, 4 pumps installed per tank.

Design flow of the in-tank pumps for tank 3 is: 690 m³ LNG/h, 4 pumps installed on this tank.

Maximum allowable pressure of the LNG piping of the LNG Terminal is 13,9 barg. Verification must be done of the cargo pumps to prevent overpressure in the LNG piping of the LNG Terminal.

5. OPERATION IN ABNORMAL CONDITIONS

5.1. Movement of the ship

Deck watch on the vessel and/or Gaz-Opale shall supervise the displacements of the ship at all times.

As soon as the ship reaches a first alarm of displacement, Gaz-Opale will inform the Ship Operator immediately. Ship Operator will take proper actions to put the ship in a correct position.

During a call at Dunkirk, the Ship operator will be able to check himself the mooring tension lines through a web link shared by the Terminal. The tension of the mooring lines will be monitored. As soon as the lower or higher limits are reached, Gaz-Opale will inform the Ship Operator. The target is to have more than 5 tons and less than 45 tons for each mooring line depending on the tide evolution.

5.1.1. Weather conditions

Before the arrival of the ship, Gaz-Opale shall check the weather conditions forecast. The forecast shall be discussed during the preliminary meeting on board of the ship.

The average wind speed shall be measured over a period of 10 min as defined in the article § 9 "Weather restrictions" of the part 4 "Port and Terminal Marine Information". (Page 26)

As from an average wind speed of 20 m/s (39 knots, 8 Beaufort) or higher the unloading/reloading operations shall be interrupted. The arms shall be drained.

New forecasts shall be communicated to the ship and monitored by Gaz-Opale and Ship operator. In case of deterioration of the forecast of the weather conditions, Gaz-Opale shall prepare the inertizing and disconnection of the unloading arms. The Shift Supervisor shall be standby in the cargo control room together with the Loading Master and the Master to evaluate the situation.

If the average wind speed increases to an average of 23 m/s (45 knots, 9 Beaufort) and the tendency shows an increasing of such wind speed, the unloading arms shall be disconnected and the gangway shall be retrieved from the ship for the duration of the event.

In case of higher wind speed, while alongside, the Master of the LNG Carrier can ask, if necessary, for one or more tugs, including the standby tug as additional assistance to hold the ship on her position. For such requests, the Master will contact the harbour authorities via VHF channel 73 and inform pilot station by channel 72.

Thunderstorms shall be monitored by Gaz-Opale in a circle of 10 km around the LNG Terminal based on information from Météorage. Thunderstorms, which are active in this circle, shall be discussed between Loading Master and Chief Officer. Decisions to continue operations will be made mutually and may go as far as interrupting unloading / reloading operations, as well as draining and stopping the unloading arms.

5.2. Total Plant Shutdown

A Total Plant Shutdown is initiated in case of a major hazard in the LNG Terminal.

This level results in the shutdown of all onshore running process equipment, isolation of the onshore system from the national gas grid and in the prevention of the escalation of potentially hazardous situations in the onshore send-out facilities and the offshore LNG Carrier. It also initiates LNG Unloading/Reloading Shutdown (ESD 1) and the activation of the Emergency Release System (ESD 2).

Total Plant Shutdown can be initiated by:

- // Total Plant Shut Down pushbutton in the Main Control Room**
- // Low low pressure in the instrument air network**
- // High high high vibration in the LNG Terminal Storage tanks**
- // High high high level in the LNG Terminal Storage tanks**
- // High high high pressure in the LNG Terminal Storage tanks**
- // High high level in the low flow flare KO drum**
- // Total power loss in the Terminal.**

5.3. LNG Unloading/Reloading Shutdown – ESD 1

The activation of the LNG unloading/reloading Shutdown ESD 1 (LNG Terminal appellation: ESD 2.2B) will be triggered by the activation of one or more of the following initiators:

// Manual push buttons:

- ESD push button in the Main Control Room
- ESD push button in the Jetty Control Room
- ESD local push button in the jetty head (escape way).

// Automatic:

- Cascaded from ESD 2 (LNG Terminal appellation :ESD 2.2A)
- Unloading arms 1st stage overreach
- High high high level in the jetty drain drum
- Low low low pressure in the LNG Terminal Storage tanks

5.4. Emergency Release System & (Un)loading Shutdown – ESD 2

The Emergency Release System & (Un)loading Shutdown ESD 2 (LNG Terminal appellation ESD 2.2A) is designed to protect the unloading arms and the jetty due to a drift in the ship's position beyond the design limits of the unloading arms.

The activation of the Emergency Release System & (Un)loading Shutdown shall at least be triggered due to one or more of the following initiators:

- // Unloading arms 2nd stage overreach**
- // Unloading arm release local pushbutton in the jetty head escape way**
- // Unloading arm package ESD pushbutton in the Jetty Control Room on the control pulpit.**

When activated, the ESD 2, shall perform at least the following actions:

- // Initiate the ESD 1 ((un)loading Shutdown)**
- // Initiate the LNG Carrier ESD**
- // Isolate and disconnect the LNG unloading arms and NG return arm (ERS valves closed and PERC disconnection)**
- // Close and segment the LNG unloading and recirculation lines and the liquid Nitrogen delivery truck valve**
- // Isolate the jetty drain drum**
- // Close the LNG onshore storage tanks filling lines**
- // Stop the LNG LP In-Tank pumps of the LNG Terminal Storage tanks selected for loading the ship**

All the initiators of the ESD 2 shall disconnect at the same time all the LNG unloading and NG return arms.

5.5. Emergency Shutdown - LNG Carrier

LNG Carrier ESD shall be triggered by one or more of the following initiators:

- // High high high pressure in LNG Terminal Storage tanks (Total Shut Down)**
- // High high high level in LNG Terminal Storage tanks (Total Shut Down)**
- // Emergency Release System & Unloading/reloading Shutdown (ESD 2)**
- // Unloading/reloading System Shutdown (ESD 1)**
- // Ship-shore link unwanted disconnection**
- // Ship's emergency push button**

In that case, LNG Carrier pumps shall be stopped.

The activation of the LNG carrier ESD is an initiator of the "fire and gas" safety system related to the fire zone of the jetty area. It results in an actuation of every ESD valve, in order to isolate the zone of the jetty.

5.6. Unloading / loading line full bore rupture detection

In order to anticipate unloading / loading line full bore rupture, the following protection has been implemented:

- // If during unloading or loading operations the pressure in the (un)loading line drops from (un)loading pressure (about 4 or 5 barg) to a pressure lower than the LNG static head (1 barg) in 15 seconds, a closing order shall be sent to the valves 01ESV006/008 via PSD system (01PSD004) which will isolate the LNG Storage Tanks from the Jetty and stops any LNG flow between LNG Tanks and ship.**

The safety aspects and responsibilities in case of Terminal Response Plan are defined in Part 6 "Safety Aspects".(Page 39)

5.7. Total loss of communication

If after several attempts to reach the cargo control room of the LNG Carrier, Gaz-Opale identifies a total loss of communication, Gaz-Opale shall initiate an unloading/reloading Emergency Shutdown signal (ESD 2.2B). Otherwise, if ship operator identifies a total loss of communication, he shall initiate a LNG Carrier shut down.

PART 6: SAFETY ASPECTS



1. INTRODUCTION

This part describes the way in which Gaz-Opale manages the emergency responses during the (un)loading operations. It also explains the internal organisation and the responsibilities during the management of any incident, without superseding any particular procedure defined by Dunkerque LNG, Gaz-Opale or Port Authorities.

The nature and the severity of an emergency situation cannot be predicted and it is therefore not possible to define in detail all actions required to eliminate or contain the emergency situation. However, the following principles should be adhered to as far as priorities are concerned:

- // Priority 1: PROTECTION OF LIVES**
- // Priority 2: PROTECTION OF EQUIPMENT**
- // Priority 3: CONTAINMENT OF EMERGENCY**
- // Priority 4: TERMINATION OF EMERGENCY**

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

2. EMERGENCY SITUATION IN THE TERMINAL

If an emergency arises in the Terminal, not affecting the ship operations, the Terminal Main Control Room will inform the ship over the UHF radio of the emergency, in this case the unloading/reloading operation shall not be interrupted and the ship should ignore any alarm from the Terminal, unless otherwise stated over the UHF radio.

If an emergency arises in the Terminal affecting ship operations, the following actions shall be taken IMMEDIATELY:

- // INITIATE ESD (if not automatically triggered)**
- // INFORM THE SHIP CARGO CONTROL ROOM OVER UHF RADIO**
- // INITIATE ACTIVE PROTECTION (if not automatically triggered)**
- // EVACUATE THE PEOPLE ON THE JETTY PLATFORM TO SAFE LOCATION**

The Shift Supervisor shall act according to the «Emergency Procedures» as specified in the terminal safety procedures.

The Master of the ship shall make the necessary preparations to safeguard the ship, i.e. unberthing if necessary. Decision to leave the berth or abandon ship is Master's decision in accordance with the GPMD Port Authorities (see also article 3.5 "Leaving the berth").

The emergency assembly location for jetty is on the North Waiting Area.



2.1. Emergency signals

The Terminal has different alarm signals that can be divided into two groups:

// The first group of alarms is normally triggered by a detection device and is a local alarm for the affected zone. The alarm is given by horns and flashing lights and only intended to order evacuation of the affected zone.

// The siren, for the POI and PPI is activated from the Main Control Room. The activation of these signals means that all personnel working in the LNG Terminal installations has to evacuate to the muster points: to the North Waiting Area for personnel who are on the jetty platform and the Jetty Road, all other personnel to the administration area, awaiting further instructions. The ship shall be informed through UHF about the nature and extension of the emergency. The sound profiles are listed here below:

- POI (Plan Organisation Interne, Internal Response Plan of the Terminal) Siren: one long signal
- PPI (Plan Particulier d'Intervention, Global Response Plan of the Terminal, impacting surroundings) Siren, with the following profile:



Figure 5: PPI siren profile

The Terminal will sound one of these two sirens in case of emergency. In both cases:

- Ship personnel remains on board.
- Shore moving personnel (i.e. on the jetty) musters at the North Waiting Area muster point.

Since normally ship crewmembers are not present in the LNG Terminal installations, they have to act according to the ship emergency procedures.

2.2. Terminal emergency communications

The UHF radio must be used for all emergency communications between LNG Carrier and Terminal. This UHF radio system allows communications between Ship Cargo Control Room, ship bridge and Jetty Control Room as well as with the Main Control Room of the Terminal. Since UHF radio handsets are given at the Master's disposal, communications with the Terminal Main Control Room are always directly possible.

Telephone lines provide a back-up system:

// Emergency Call: 112

// Hot line: Direct line

// Normal lines:

- Main Control room: 3005 (local telephone network) or +33 3 28 51 87 13
- Jetty control room: 2050 (local telephone network)
- Loading master mobile: +33 6 98 97 06 32

For internal terminal emergency communications, a separate UHF radio system is used.

2.3. Emergency means

At the outbreak of fire on the ship or inside the Terminal, Gaz-Opale and Ship Operators shall immediately cease LNG transfer by activating the ESD system (if not automatically triggered). In addition, the Terminal can cease send-out operations. Details of the fire shall be communicated using UHF radio as soon as possible indicating the nature of fire. The mooring stations shall

be operated by the Terminal at the request of the Master for an emergency departure. Dunkerque LNG shall inform the fire brigade and the Port Authority and, if necessary, on request by fire brigade, the mobilization of the tugboat's firefighting capability. Be aware that a tugboat will always be in the neighbourhood of the LNG Carrier during the call.

The following means are available on the jetty to be used depending on the type of incident:

- // High flow water monitors with adjustable spray pattern are installed east and west of the transfer arms. These monitors are remote operated;**
- // Water curtain between the ship manifolds and the transfer arms;**
- // Water curtain at the under structure of the jetty platform**
- // Water curtain system on the jetty to protect the access to the Jetty Control Room;**
- // Water curtain to protect the jetty control room**
- // Leaking LNG from transfer arms is collected in a collecting system which is protected by Hi-Ex foam**
- // On the jetty at road level: dry chemical hand-hoses are available**
- // The drain drum on the jetty is protected with a water curtain**
- // One SOLAS International shore fire connection is available on the jetty.**
- // One tug is on duty during all mooring and transfer operations**

3. RESPONSE ON EMERGENCY SITUATIONS

3.1. General

This part deals with actions to take in case of emergencies on the ship affecting the terminal installations and emergencies in the Terminal affecting the LNG Carrier.

3.2. Suspension of cargo transfer

In any emergency situation or situation which is deemed as likely to develop into an emergency situation, the LNG Carrier and/or the Terminal shall cease any transfer operation by activation of the emergency shutdown system.

Effective use of the emergency communication (UHF radio) shall be made to be sure that the respective parties are fully aware of the situation and anticipated actions.

3.3. Incidents on board the ship

3.3.1. Fire on board the ship

Any incident of any kind resulting in death or injury or damage to vessel or port/terminal installations or vehicles or near miss that could have resulted in an incident shall be reported to GPMD Port Authorities via VHF Channel 73 and to Dunkerque LNG. The emergency calling checklist to report to the involved parties is explained in article 3.6.

At the outbreak of a fire on board the ship, the ship personnel discovering the fire, shall:

- // Initiate the ship alarm system and stop LNG transfer**
- // Indicate the location of the fire**
- // If possible restrict the spread of the fire**

The ship safety procedure shall be checked and explained during the preliminary meeting as it is a part of the ISGOTT safety checklist.

Details of the fire shall be passed on to the Terminal Main Control Room using the UHF radio system, indicating the nature of the fire, type of assistance required and nature of casualties if any.

The Master or his deputy shall inform the Port Authority and, if necessary, in accordance with the fire brigade the request of the mobilization of the tugboat firefighting capability. The ship engines shall be made ready for immediate use. Dunkerque LNG is responsible for informing all other relevant functions within the plant and arranges for the Terminal's firefighting capability to be mobilized as required.

The terminal Shift Supervisor shall act according to the «Emergency Procedures» as specified in the terminal safety procedures. He will organize the access for the Public Fire Brigade by remote opening of all gates toward the jetty.

The Master is responsible for coordinating the firefighting operations on board and directing the use of the public emergency teams and the Terminal firefighting equipment. If the fire cannot be controlled or contained or if the Terminal installation is seriously endangered both situations can lead to the leaving the berth scenario (see article 3.5).

3.3.2 LNG leakage on board the ship

In the event that LNG leakage, inclusive of overflows, occurs on board, the ship's personnel shall immediately activate the emergency shutdown system to stop LNG transfer. The Terminal shall be informed over the UHF radio.

If the vapor cloud formed threatens the jetty area, the remote-controlled water monitors and the water curtains shall be used by Gaz-Opale to control the vapor cloud. If necessary, personnel on the jetty will evacuate to the North Waiting Area.

3.4. Incident on jetty

In the event of an incident on the jetty, the jetty area will be put in alarm by the Terminal Panel Operator, if not triggered by detection. The ship will be informed by UHF about the nature of the incident.

No attempt shall be made to take whatever action that would necessitate entering the vapor cloud.

3.4.1 Fire on jetty

At the outbreak of fire on the jetty, Gaz-Opale shall immediately cease all operations by activating emergency shutdown systems.

LNG spills under the transfer arms and drain drum will be collected through a channel toward a remote protected concrete retention basin. In case of a LNG pool fire, the activation the Hi-Ex foam system ensures the fire control. If needed, extinguishment can be done with the fixed dry chemical system located on the road level platform.

These types of fires, when properly reacted to as described here above, are not likely to put the ship in danger. The Terminal has its own cooling capabilities (water spray systems and remote-controlled water monitors) to protect the installations from heat radiation.

If the fire cannot be controlled or contained, the jetty must be evacuated. Emergency assembly location for the jetty is set at the North Waiting Area (jetty lock).

3.4.2 LNG leakage on jetty

If a LNG leakage occurs on the jetty, inclusive on the transfer arms and ship manifold connections, transfer operation shall be stopped immediately by Gaz-Opale by activating ESD if not automatically triggered. The ship shall be informed of the incident by means of the UHF radio.

If the LNG leak endangers the ship structure, the water monitors on the jetty shall be put into use in order to assist the ship personnel in preventing sub-cooling of non-cryogenic structures of the ship.

The spilled LNG under the transfer arms will be drained away from the platform in a retention basin as described in article 3.4.1 above where a Hi-Ex foam system is installed for vapor control.

3.5. Mooring's problems

The Ship Master is responsible for the mooring following up and adjustment in case of needs. If the vessel is moored according to the basic mooring configuration there are no predictable conditions that could lead to the need for additional assistance but in case of problems with mooring arrangement the Ship Master shall act.

3.5.1. Issues with the mooring lines

3.5.1.1. Mooring line tension out of range

The tension mooring line should be between 4 to 45 tons. This mooring tension is monitored directly via the web link provided by the terminal operator or if it is not available by the terminal operator. If the mooring tensions are less than 5 tons or more than 45 tons, the ship's crew will have to readjust their mooring tensions after having warned the Main Control Room. During this operation, the vessel must always ensure that it is properly aligned with the vapour center line.

3.5.1.2. Mooring line rupture

The Ship Master must inform Gaz-Opale and Port Authority by VHF channel 73 in the aim to correct the situation. If linesmen are not present, linemen should come back on site to correct the mooring arrangement (Terminal operator is not allowed to handle mooring line). Notwithstanding the above, the ship Master has the authority to summon tug assistance to ensure the ship remains safely moored alongside the jetty. One tug with firefighting capacity is at constant stand-by. Tug assistance can be summoned through GPMD Port Authorities VHF 73 and inform pilot station by VHF channel 72.

3.5.2. Emergency departure

The decision whether the ship should evacuate the berth, shall be made in consultation between the Ship Master and the Port Authority. Such consultations shall consider the need to avoid actions that might increase rather than decrease the danger to the ship or to the Terminal.

In emergencies, the GPMD Port Authority can instruct the Master to leave the berth.

If the Master judges an emergency departure necessary, he shall formally request over UHF radio release of mooring lines. Gaz-Opale will remotely or locally release the mooring lines one by one. Emergency uncoupling (PERC) will be activated by Gaz-Opale.

3.6. Emergency management

3.6.1. General

All incidents mentioned in Article 3 shall be communicated externally as follows:

// Ship will notify:

- GPMD Port Authorities channel 73

// Gaz-Opale will notify:

- Public Fire Brigade: direct hotline
- Port Authority: by radio to GPMD Port Authorities: channel 73 and 03 28 75 96 (24/24)

In addition, the Shift Supervisor in concert with the Terminal Manager (or representative on duty) will decide whether the emergency procedure «Terminal Evacuation» will become effective. The ship shall be informed immediately over UHF radio in the case it is judged necessary to evacuate the Terminal.

3.62. Emergency response organization

During normal working hours the Emergency Coordinator organizes the emergency response team. The emergency response team is composed of:

- // **The Terminal Manager or the Deputy Terminal Manager (Emergency Coordinator)**
- // **The Operations Manager (process coordinator)**
- // **The Maintenance Manager (support and logistics)**
- // **The HSEQ Manager (coordinator for emergency actions between Terminal and official fire brigade)**
- // **The Emergency Intervention Team.**
- // **The Emergency Technical Team.**

The Shift Supervisor, as leader of the Emergency Intervention Team, leads the actions to control or to end the emergency.

If an emergency arises during off-hours, it is the Shift Supervisor who assures all functions until arrival of the Gaz-Opale manager on call and the on-duty Emergency Technical Team.

3.63. Responsibilities

Irrespective of the Terminal obligation to inform immediately the authorities (DREAL, Port Authorities, ...), the Ship Master remains fully responsible to communicate all incidents on board to the authorities.

Gaz-Opale is responsible for any emergency situation arising within the shore plant and on the jetty, inclusive the transfer arms and their connection to the ship manifold.

The Ship Master is responsible for any emergency situation arising on board.

In either case, the person who has overall responsibility, the Master for the ship and the Terminal Manager for the Terminal, shall ensure that the opposite party is promptly informed of the seriousness of the incident.

All members of the terminal Emergency Team will communicate over UHF radio as the situation requires. The Emergency Coordinator, as leader of the terminal Emergency Team, is responsible for coordination between LNG Carrier, Terminal and authorities with respect to actions affecting the safety of the Terminal.

3.64. Emergency plan and fire-fighting means

Ship and Terminal shall adhere to the following rules and recommendations:

- // **Marine Procedure Manuel (Part 4)**
- // **Safety Guide for Terminals Handling Ships Carrying Liquefied Gases in Bulk (OCIMF).**
- // **Liquefied Gas Handling Principles on Ships and in Terminals (SIGTTO).**
- // **Tanker Safety Guide (Liquefied Gases) - International Chamber of Shipping.**
- // **International Safety Guide for Oil Tankers and Terminals (OCIMF and ICS)**

This list is non-exhaustive.

In order to be ready for any emergency that could occur, the Ship shall:

- // Have their fire pumps ready for an immediate use. The fire main must be pressurized during all the stay at berth.**
- // Have 4 to 6 fire hoses and nozzles rigged to their fire hydrant and unrolled on the main deck.**
- // Have powder extinguishers systems nearby the ship manifolds and ready for use.**
- // Have an SOLAS International Fire Connection available which location is clearly identified**

Safety and security rules (prohibition of smoking, of phoning, of taking pictures...) are shown on the ship dedicated gangway and must be strictly followed. A gangway supervision person should be posted preferably at the shore end.

For the Terminal firefighting means to be used in an emergency event have been described in Article 2.3.(Page 40)

4. CONTACTS OF OTHER HARBOUR SERVICES

In case of emergency, following contacts can be used. Those contacts are on call duties for 24h/24h services.

// Harbour Master Office

- Tel: +33 (0)3 28 28 75 96
- Email: HarbourMaster@portdedunkerque.fr
- Dunkerque VTS by VHF 73

// Pilots:

- Tel: +33 (0)3 28 66 10 70
- Email: tov@pilotagedunkerque.com
- Dedicated VHF channel: VHF Vigie Marck Canal 72

// Linesmen:

- Tel "East": +33 (0)3 28 63 37 50
- Tel "West": +33 (0)3 28 21 45 10
- Email: president@lamanage-dunkerque.com
- No dedicated VHF channel

// Tugboats « Office – BOLUDA Dunkerque »:

- Tel: +33 (0)3 28 65 81 10
- Email: vigie.dunkerque@boluda.fr
- No dedicated VHF channel

APPENDIX 1: FORMS OF NOTICES



1. FORM OF THE CARGO INFORMATION NOTICE

FROM	<u>MASTER OR CUSTOMER OF THE LNG CARRIER</u>
TO	controlroom@gazopale loadingmaster@gazopale.com ext-security@gazopale.com DKoperations@dunkerquelng.com directionoperations@dunkerquelng.com
OBJECT	<u>Name of the ship</u> / Cargo Information Notice

Dear Sir or Madam,

Please notice the departure from the Loading/Unloading Port:

// Name of the LNG carrier/IMO Number
// Departure of the LNG carrier from the last Port: Port Name - DD/MM/YYYY
// ETA at the Pilot Boarding Station: DD/MM/YYYY at HH:MM LT
// Operation to be performed at the Terminal: Unloading or reloading

If the ship is fully loaded with LNG:

// Only LNG
// Nominated Cargo of LNG to be discharged: XXXXXm³ LNG and XXX kWh
// Certificate confirming the loaded quantities both in energy terms and in cbm, the GCV of LNG, the density in kg/m³, the temperature in °C and the composition in mol% (to be sent by the Customer)
// Total volume of LNG on board: XXXXm³ (LNG) and XXX kWh
// The average LNG temperature in °C and the absolute pressure of the vapour in mbar of each cargo tank: XX°C/XXXmbara
// Level of impurities (to be sent by the Customer)

If the ship's cargo tanks are cold, under natural gas atmosphere and ready for reloading and;

// Cold, under natural gas atmosphere and ready for reloading under Natural Gas atmosphere
// Heel volume of LNG: XXX m³
// A certificate confirming the latest loaded cargo composition in mol% (to be sent by the Customer)
// The actual temperature in °C of the vapour and the absolute pressure in mbar of each cargo tank: XX°C/XXXmbara
// The volume of LNG to be loaded: XXXm³ and XXX kWh

Plus,

// Provide the certificate of origin of the cargo.
// Provide the quantity and quality certificate at the loading port.
// Any operational deficiencies of the LNG Carrier that may affect her port and berth performance
// The required bunkering quantities and provision during the relevant berthing
// The estimated of required time for taking bunkering/stores/provision on board and putting waste on the jetty platform; XXh and YYmin
// The LNG Carrier's waste disposal: quantity (weight, volume, packing) and proper identification in conformity with all applicable maritime and port regulations (update list of waste disposal to be sent as soon as possible but at least 48 hours before ETA at the PBS)
// The list of expected visitors, suppliers, contractors (updated list to be sent twenty-four (24) hours before arrival, through Ship Operator's Agent)

And ISPS code security level.

Regards,



2. FORM OF THE ETA NOTICE

FROM	<i><u>MASTER OF THE LNG CARRIER</u></i>
TO	controlroom@gazopale loadingmaster@gazopale.com ext-security@gazopale.com DKoperations@dunkerquelng.com directionoperations@dunkerquelng.com
COPY	<i><u>As needed</u></i>
OBJECT	<i><u>Name of the ship / 96 / 72 / 48 / 24 / 12 / 2</u></i> hours ETA
<p>Dear Sir or Madam,</p> <p>Please note the daily ETA Notice for <i><u>DD/MM/YYYY</u></i></p> <p><i>// <u>Name of the LNG carrier/IMO Number</u></i> <i>// ETA at the Pilot Boarding Station: <u>DD/MM/YYYY</u> at <u>HH:MM</u> LT</i> <i>// Position of the LNG carrier at noon time (vessel local time): <u>XXXXXX</u></i> <i>// ISPS security level: Level X</i> <i>// Remaining LNG volume: <u>XXXXXm³ LNG</u></i> <i>// Average liquid temperature of the LNG: <u>XXX°C</u></i> <i>// Absolute pressure of the cargo tanks: <u>XXX mba</u></i></p> <p style="text-align: right;">Regards,</p>	

3. FORM OF TERMINAL STATUS NOTICE

FROM	loadingmaster@gazopale.com
TO	<i>Master of the cargo</i>
COPY	controlroom@gazopale.com loadingmaster@gazopale.com ext-security@gazopale.com DKoperations@dunkerquellng.com directionoperations@dunkerquellng.com Customer
OBJECT	<i>Name of the ship / IMO: ship's IMO /</i> Terminal Status Notice

Dear Sir or Madam,

Dunkerque LNG is notifying hereby that the current ETA of the LNG Ship *Name + IMO* is:

// compatible with the Scheduled Arrival Window corresponding to the slot *Slot ID* and that the Terminal would be able to provide the Services as defined in our *Throughput Agreement/Spot Throughput Agreement*

or

// in advance compared to the Scheduled Arrival Window (SAW) corresponding to the slot *Slot ID* and that the Terminal would be able to provide the Services as defined in our *Throughput Agreement/Spot Throughput Agreement* from the start of the Schedule Arrival Windows.

or

// compatible with the Scheduled Arrival Window corresponding to the slot *Slot ID*. However Dunkerque LNG would not be able to fully provide the Services as defined in our *Throughput Agreement/Spot Throughput Agreement* for following reasons: REASONS AND CONSEQUENCES...

or

// not compatible with the Scheduled Arrival Window corresponding to the slot *Slot ID*. Dunkerque LNG will use reasonable endeavours to permit the berthing of the LNG Carrier at the first available opportunity that does not affect the safety of the Terminal or the provision of Services to other Capacity Users, which is expected such as: *Expected date and hour*

or

// All other specific wording

Please find below slot information:

Berthing slot ID	Estimated time at PBS	Estimated time for All Fast	Nominated Cargo to be unloaded/reloaded (m ³ LNG)
2023-123	DD/MM/YY hh:mm	DD/MM/YY hh:mm	129,000 m³

// The Terminal also notifies that special request (*Special request e.g. bunkering, storages, stripping...*) has been received and thus a **X** hours extension of Allowed Laytime has been granted to the shipper.

or

// The Terminal notifies that no special request (bunkering, stores, stripping...) has been received and thus no extension of Allowed Laytime has been granted to the shipper.

Should you have any question and/or problem in such respect, please do not hesitate to contact us.

Best regards,



4. FORM OF THE NOTICE OF READINESS

FROM	<i>MASTER OF THE LNG CARRIER</i>
TO	controlroom@gazopale loadingmaster@gazopale.com ext-security@gazopale.com DKoperations@dunkerquelng.com directionoperations@dunkerquelng.com
COPY	<i>As needed</i>
OBJECT	<i>Name of the ship /</i> Notice of Readiness
<p>Dear Sir or Madam,</p> <p>Please find attached the Notice of Readiness of the <i>ship IMO</i>.</p> <p style="text-align: right;">Regards,</p>	



4. FORM OF THE NOTICE OF READINESS

NOTICE OF READINESS					
TO	DUNKERQUE LNG TERMINAL (Dunkerque LNG / Gaz-Opale)				
TO	CUSTOMER				
FROM	Master. LNG/Ship Name				
PORT	Dunkerque LNG, France				
<p>Date: _____ Time: _____ Hrs Local Time</p> <p>This is to inform you that the LNG Carrier _____, owned by _____ under my command, has arrived at the Pilot Boarding Station at _____ hours, has cleared the necessary formalities with the Port Authority, Harbour Master and all other relevant authorities, has complied with all necessary customs notification requirements and is ready in all respects to proceed to the berth. The pressure of each tank of the LNG carrier at the moments:</p>					
Tank number	1	2	3	4	5
Pressure measured at CTS					
<hr style="border: 0.5px solid black;"/> <p>Company Stamp</p> <hr style="border: 0.5px solid black;"/>			<hr style="border: 0.5px solid black;"/> <p>Master signature</p> <hr style="border: 0.5px solid black;"/>		
<p>Notice accepted by the Terminal (or their representative)</p> <p>Date: _____ Time: _____ Hrs Local Time</p>					
<p>Observations:</p> <hr style="border: 0.5px solid black;"/>					
<hr style="border: 0.5px solid black;"/> <p>Company Stamp</p> <hr style="border: 0.5px solid black;"/>			<hr style="border: 0.5px solid black;"/> <p>Name (receiver) + signature</p> <hr style="border: 0.5px solid black;"/>		



5. SPECIFIC ANNEX FOR SMALL SCALE

LNG Carriers between 5,000 m³ LNG up to 65,000 m³ LNG are considered below:

// Harbour Master Office recommendations:

- Due to the proximity of the ports from which these «small» vessels may come (Rotterdam, Antwerp, etc.), it is imperative to have an ETA and the regulatory documentation (MD manifest, safety declaration, waste declaration, crew list, health declaration, etc.) at the stopover 24 hours before arrival at the latest or at the departure from the previous port if it is less than 24 hours away to come to Dunkirk.

// Pilots:

- No tide restriction on entrance to the West port for small vessels
- The anchoring area for small vessels will be located in zone B2, just like the other gas tankers entering Dunkirk. (LPG ships for example)
- A single pilot on board for ships of less than 65,000 m³ is enough.
- In order to properly anticipate the use of the helicopter by the pilots, the shipowners will be asked to send the ships particulars. The first arrival of a ship in Dunkirk will allow this aspect to be physically validated. The first landing can be done using a pilot boat at first.

// Tugs:

- Between 0 and 2 tugs in assistance are to be expected depending on the vessel's equipment (bow thruster in good working order) as well as weather conditions. (same for entrance and departure).
- No need to have a dedicated tug on standby in close proximity to the LNG berth during all the stay of the small LNG Carrier alongside the berth.
- A tug is available in the port of Dunkirk 24 hours a day, 7 days a week in order to respond to all emergency situations in this sector if necessary for small scale operations.

// Linemen:

- For mooring, only plan 6 linemen instead of the current 8 for conventional LNG carriers. (2 in each of the 2 boats + 2 in the terminal - one at the front and one at the rear)

// Weather restrictions:

- No change for the «weather restrictions» on entrance.
- Special attention will be accorded to the swell in the event of a strong wind. The problem is mainly linked to the swell which disrupts the mooring operations for the linemen's boat.





Dunkerque LNG SAS

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dunkerque LNG 
fluxys