Hellenic Gas Transmission System Operator S.A.

LNG TERMINAL 'REVITHOUSSA'

Marine Procedure Manual

Terminal Regulations

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DESFA S.A.

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1. Introduction

1.1 Scope

The scope of this "Manual" is to particularize procedures and regulations to be followed by all LNG ships (the "LNG Carrier" or "LNG Carriers") calling and operating at DESFA's LNG Terminal in Revithoussa Island, Greece (the "Terminal") and to provide necessary information before the time of their arrival at the pilot station until their departure from the Terminal's area.

This Manual, which takes also into consideration the General Regulation of Ports No. 18 of 1999 (as amended) of the Hellenic Port Police – Hellenic Coast Guard on the Conditions and Safety Measures of Loading, Discharging and Transshipment of Liquefied Gases ("Reg. no. 18"), industry best practices, acts as supplementary instructions for the waterfront operations at the Terminal and does not substitute them.

The Manual should be read together with the Terminal's Conditions of Use ("CoU"). In case of conflict between the CoU and the Manual, the CoU shall prevail.

1.2 General Requirements

An LNG Carrier calling for discharging at Revithoussa LNG Terminal shall be capable of safely operating within the limitations of the berth and operate in accordance with all Laws, Decrees, Decisions, Ministerial Decisions, Regulations etc of Greece as well as with the International Conventions that Greece has ratified.

Each LNG Carrier calling at the Terminal must follow the rules and requirements of the "LNG vessel approval procedure" of the Terminal before its first calling.

LNG Users of the Terminal can apply to the Terminal for an LNG Carrier compatibility study, at least thirty (30) days before the subject LNG Carrier's first calling at the Terminal or in advance. Only LNG Carriers which satisfactory pass all steps of LNG Carrier approval procedure can call and discharge LNG cargo at the Terminal.

This Manual is provided to any LNG Carrier applying for approval and/or operation at the Terminal and should be agreed by all users who wish for LNG cargo to be discharged and handled at the Terminal.

In accordance with the requirements of Reg. No. 18, the Terminal has authorised staff (the Terminal Representative) responsible for all LNG Carrier's operation at the Terminal. The Terminal Representative, available for each operation, is the contact person with all related parties for the port approach, berthing and mooring of LNG Carriers at the Terminal, supervises all the operations and assists the Terminal/LNG Carrier's staff for arising tasks and executes for and on behalf of the Terminal all issues described throughout this Manual.

LNG Carriers calling at the Terminal shall comply with International LNG Vessel Standards, Guidelines and must be designed, constructed, equipped, operated, and maintained so as to remain in compliance with the applicable IMO Gas Carrier Codes and equipment of LNG Carriers carrying liquefied gases in bulk *(IGC Code as incorporated into Greek Law by the Presidential Decree 126/1987 as amended)* at all times and while within the Terminal's berth. Older LNG Carriers may have been constructed or may comply with the predecessors of this code. These codes, supported by the rules of the classification societies classifying LNG Carriers, ensure that items such as the materials of construction, cargo containment system, cargo transfer system, electrical installation, fire and safety equipment and instrumentation are of internationally accepted standards.

All LNG Carriers discharging LNG at the Terminal must be classed by a member of the International Association of Classification Societies (IACS).

Membership with a P&I Club, member of the International Group, is also necessary for all LNG Carriers calling at the Terminal. The LNG Carrier must provide to the Terminal the insurance documents proving her P&I membership as well as her Blue Card (as per the Bunkers Convention 2001, which was ratified by Greece and was incorporated into Greek Law by Law 3393/2005 as amended).

The LNG Carrier should have a valid OCIMF *SIRE* not older than 12 months prior to the time of her arrival at the Terminal.

A vessel traffic service shall be provided in accordance with the requirements and recommendations of SOLAS chapter V (Safety of Navigation).

Vessel traffic services (VTS) contribute to the safety of life at sea, the safety and efficiency of navigation and the protection of the marine environment, adjacent shore areas, work sites and offshore installations from possible adverse effects of maritime traffic.

LNG Carriers shall at all times, comply with the International Code of Signals and display flags, shapes and lights as required by the International Regulations for the Prevention of Collision at Sea (as incorporated into Greek Law by the Legislative Decree no. 93/1974).

All LNG Carriers, alongside the Terminal's berth from sunrise to sunset shall raise their national flag and the Greek flag.

The LNG Carrier's means of communication must fully comply with applicable laws and regulations, as well as being operational such as to be in position to communicate at all times with the Terminal, other ships in the area and authorities in any case and/or in an emergency situation.

LNG Carriers shall always have and retain onboard, adequate in terms of quantity and training crew (as required by their flag) with good working knowledge of the written and spoken English language to enable operations to be carried out safely and efficiently, as well as to maintain cargo operations records.

Masters of LNG Carriers should be aware that their LNG Carrier can be the subject to Port State Control and Port Authority inspections to investigate compliance with the requirements of international conventions, such as SOLAS, MARPOL, STCW, ISPS and the MLC. All valid and applicable trading certificates, documents, manuals, publications, and charts as required must be on board the LNG Carrier and be available for inspection at all times.

1.3 Definitions

DESFA	Hellenic Gas Transmission System Operator.
ESD	Emergency Shut Down (as related to LNG Carrier/shore operations).
ETA	Estimated Time of Arrival.
Exclusion Zone	An exclusion zone established round the jetty within all other LNG Carriers and service craft are not permitted to enter.
Heel	The amount of liquid LNG retained in a LNG Carrier's cargo tank at the end of discharge.
Port Authority	Hellenic Coastguard.
IMO	International Maritime Organization.
Jetty man	The Terminal operator assigned for watch keeping duties on the jetty.
LNG	Liquefied Natural Gas and its principal constituent is methane. It is held at close to atmospheric pressure at a temperature of about –162°C.
Terminal Representative	Authorised by DESFA SA person(s) appointed to represent the Terminal on board and coordinate the communication between Terminal and all involved parties for any LNG Carrier call at LNG Terminal.
MARPOL	International Convention for the Prevention of Pollution from LNG Carriers.
Mooring gangs	People team on mooring boat and on jetty (subcontracted) deploys the mooring lines according to the agreed mooring plan.
OCIMF	Oil Companies International Marine Forum.
PERC	Power Emergency Release Coupling.
PPE	Personal Protective Equipment.
PFSO	Port Facility Security Officer, Terminal Security officer.

QC/DC	Quick Connect / Disconnect Coupler.
LNG Carrier's Agent	The local LNG Carrier's Agent appointed by the LNG Carrier while the LNG carrier is in Greek waters.
Shift Leader	The Terminal employee assigned to manage the shift operators.
SIGTTO	Society of International Gas Tankers and Terminals Ltd.
SOLAS	International Convention for the Safety of Life at Sea.
User	Company authorized to bring Cargo at Revithoussa LNG Terminal and using its facilities.

1.4 Revision

In case of new laws, regulations etc. or of amendments of present laws, regulations etc. or technical or other changes taking effect, the Terminal will amend the Manual accordingly. However, such new laws, regulations etc. or amendments of present laws, regulations etc. or technical or other changes shall be binding and enforceable on the LNG Carrier irrespective of whether some have been incorporated in the revised Manual or notified to the LNG Carrier. In any case, the Manual will be reviewed and updated every three (3) years. The latest revised version of the Manual shall be uploaded to DESFA's website.

2. Overview of the Terminal

2.1 Terminal Location/Communication and Technical Parameters

The Terminal is situated in the Gulf of Megara (Kolpos Megaron) on Revithoussa Island (Nisos Revithoussa) and is some 10 nautical miles west of Piraeus, Greece.

Terminal geographical position (jetty head)	37° 57.6' N 23° 24.2' E

Anchorage area (1), (2)	A) 37°57'48''N 23°22'06''E	B) 37°57'48''N 23°22'56''E
	C) 37°57'30''N 23°22'56''E	D) 37°57'30''N 23°22'06''E

(1) Temporary anchorage area for three days plus two additional days, after the prior approval from the Elefsina Port Authority.

(2) Anchorage area is used also for Pilot boarding on vessels.

2.2 General Communications

The Terminal is operated by DESFA S.A., the Hellenic Gas Transmission System Operator.

Addresses:

DESFA S.A.
Head Offices
357-359 MESSOGION AV.
GR 15231 HALANDRI ATHENS

REVITHOUSSA LNG TERMINAL
REVITHOUSSA Island
19100 MEGARA
ATTIKI – GREECE

DESFA S.A.

Telephone lines / fax. REVITHOUSSA LNG Terminal

	International call	**fax**
Plant Manager	+30-213-0-885320	+30-213-0-885322
Terminal Representatives	**+30 6947877554** **+30 6945111118** +30-213-0-885319 +30-213-0-885314	
Operation Manager	+30-213-0-885324	
Main Control Room	+30-213-0-885350 +30-213-0-885355	+30-213-0-885358
e-mail address	**DesfaLNG@DESFA.GR**	

2.3 Exclusion Zone

Elefsina Port Authority has declared a 200m exclusion zone around the Terminal's jetty and pilots on other LNG Carriers should be aware of this restriction, so keeping a wide distance from moored LNG Carrier.

2.4 Vessel General Acceptable Parameters

The jetty is suitable for LNG Carriers with the following size limitation:

Max Length overall (LOA)	330 m
Min Length overall (LOA)	180 m
Max Draft	12 m

2.5 Cargo Reception

The cargo reception is carried out at one jetty on the south-east side of the island and following the procedures for unloading and storage facilities of the Terminal.

Terminal Storage Tanks type and capacity	2 underground and 1 semi underground full containment 9% Ni 2 x 65.000 m^3 and 1 x 95.000 m^3
Terminal Useful Storage Capacity	**225.000 m^3**
Max Unloading Rate	7.250 m^3/h
Max Operating pressure at manifold	5 barg
Max cargo temperature	-158 ^oC
Max Pressure of Cargo tanks on arrival	150 mbarg

2.6 Weather/ Tidal Data/Water depths

Winds and Waves

The predominant wind direction is from NW and SW and the wind speed frequency per year is shown in the table below:

Yearly frequency of winds from Pireaus weather stations

Wind (Beaufort)	Piraeus Station (1956-1996)
	%
0	2,1
1	18,5
2	30,9
3	26,3
4	14,9
5	**4,8**
6	**2,0**
7	**0,4**
8	**0,1**
9+	**0+**
	100

- Wind of Beaufort 2 for just over 30% of the year and for about 90% is less than 4 beaufort scale.
- Winds for over Beaufort 5 (17-21 Knots) are recorded for a period only 7,3% of the year with North, North West to be predominant and especially winter time (for over 10%).
- On about four of five occasions per year northerly winds can exceed Beaufort 6.

- Winds of up to Beaufort 8 are experienced from time to time, more usually from the north.
- Storm force winds with velocities of Beaufort 8 occur about three or four times per year.
- In spring and autumn winds are mainly westerly while in summer they tend to be variable.
- Calculations made for wave height at Revithoussa provide the following data.

Wave heights at Revithoussa are shown below in correlation with wind velocity.

Wind Speed (Beaufort)	**Wind Direction – Wave Height (m)**							
	N	NE	E	SE	S	SW	W	NW
6	0,4	0,4	0,7	**1,0**	**1,5**	**1,4**	**1,0**	0,6
7	0,6	0,6	0,9	1,4	1,8	-	1,4	0,8
8	0,8	0,8	-	-	2,3	-	1,8	0,9

Waves for more than 1m are formed from the SE to W for winds above 6 of Beaufort scale (yearly frequency occurrence <3%).

Visibility and Currents

Atmospheric visibility in the area is reduced to less than one nautical mile only on about two or three occasions per year. Currents are reported to be minimal and seldom of concern.

Tidal Data

H.A.T. (Highest astronomical Tide)	**1,08m**
M.H.W.L. (Mean High Water Level)	0,64m
M.S.L. (Mean Sea Level)	0,61m
M.L.W.L. (Mean Low Water Level)	0,59m
L.A.T. (Lowest Astronomical Tide C.D.)	0,00m

2.7 Water Depths at the Berth and Under Keel Clearance (UKC)

Minimum water depths in the berth approaches (manoeuvring areas) are much greater than those available alongside (30-60 m) and this includes the immediate approaches to the berth from either easterly or westerly directions.

These greater depths (30-60 m) also apply to the LNG carrier anchorage positioned 1½ miles west of Nisos Pachi. The anchorage is available in exceptional cases when ships are delayed prior to berthing. However, shipmasters are advised to give Mastiff shoal, marked by a navigational buoy (some 0.8 nautical miles south of Revithoussa), a wide berth.

Depth is reduced 30m transverse from berthing line and the bathometry survey gives the figure:

Depth alongside berth (LAT)	**13,5 m**
Dock water density	1.025 Kg/m^3

Terminal requires LNG Carrier's Masters to always maintain a minimum Under-Keel Clearance (UKC) of at least 1m **alongside berth.**

Bathometric chart of Revithoussa jetty water depth is shown in the appended Figure in Att. 2.

2.8 Jetty Facilities

Details and data information for jetty facilities are mentioned in Jetty and Terminal information Att. 1.

3. LNG Carrier Arrival

All users bringing LNG cargo at Revithoussa LNG Terminal should be aware that the Hellenic Coastguard is the Greek State authority regarding all matters on safety, security, pollution issues and free pratique.

3.1 Standard LNG Carrier Arrival Procedure

All LNG Carriers scheduled for discharge at the Terminal must comply with the following LNG Carrier-arrival procedure.

Via the LNG Carrier's Agent or directly to DesfaLNG@DESFA.GR by email, the LNG Carrier's Master gives the Terminal advanced notice of the expected time of LNG Carrier's estimated time of arrival ("ETA") at the following intervals:

- 72 hours prior to arrival
- 48 hours prior to arrival
- 24 hours prior to arrival
- 12 hours prior to arrival

The ETA message of 72 hours prior to arrival must include the following information:

- Name of LNG Carrier/IMO Nu and contact details: LNG Carrier's Inmarsat No's GSM (mobile), Email
- Name of LNG Carrier's Master
- Quality of cargo and Quantity for discharge (Cargo doc.)
- Arrival draft forward and aft and estimated departure draft

The ETA message of 48 hours prior to arrival must include the following information:

- Cargo and Ballast Handling Procedure
- Annex II (Waste record book)
- ISPS doc and visitor list on board

The ETA message of 24 hours prior to arrival must include the following information:

- status of LNG Carrier's lines on arrival (pre-cool and drained or warm)
- Striping/Heel out requirement
- Storing requirements during alongside

- Verification that there are no unusual temperatures or pressures in any cargo tank, hold or inter-barrier space
- Verification that the LNG Carrier's ESD valves work properly, cargo handling equipment is functioning properly and cargo pipelines have shown no signs of leakage
- Verification that the gas detection system is functioning properly with no unusual readings at any sample point
- Verification that the oxygen concentration in all inerted spaces is at an appropriate level
- Verification that the LNG Carrier's navigational status is in accordance with SOLAS requirements and that the largest scale chart for Revithoussa and its approach is available on board
- Provide information of any LNG Carrier defects that may affect her classification, port performance, cargo operations or manoeuvrability, including the need for repairs (if any)
- Tug Boats name and capacity suitable to manoeuvre the LNG carrier, according to local Port Authority rules, should be acknowledged to the Terminal.
- Mooring boats and crew assist berthing operation should be acknowledged to the LNG Terminal
- Verify that the LNG Carrier complies with ISM code
- Verify that the LNG Carrier's Master has acknowledged of Marine Procedure Manual and CoU of the Terminal.

Concurrent with the ETA message the LNG Carrier's Master shall report on the condition of the LNG Carrier, in accordance with European Union Directive 2002/59/EC (as amended) and incorporated into Greek Law with Presidential Decree 49/2005 (as amended) regarding setting up a vessel traffic monitoring and information exchange system. If there is any change in the LNG Carrier's condition that might affect her safety or her cargo, the LNG Carrier's Master must immediately notify the LNG Carrier's Agent for onward transmission to the Terminal, as specified above.
The arrival message also covers any illness amongst the LNG Carrier crew but if this is irrelevant, the LNG Carrier's Master requests, Free Pratique from the port health authorities.

3.2 Notice of Readiness (NOR)

The LNG Carrier's Master or LNG Carrier's Agent on arrival of her LNG Carrier at Pilot Station must give Notice to the Terminal by VHF ch. 68 and/or telephone that the LNG Carrier is ready to proceed at the Terminal for the berthing and unloading operation.

The Terminal Representative will instruct the LNG Carrier accordingly by accepting the Notice for the LNG Carrier to proceed for berthing and unloading operation.

The Notice of Readiness (NOR) states the time and date of LNG Carrier's arrival on Pilot Station is tendered and signed from the LNG Carrier's Master.
The Terminal Representative accepts and signs the NOR after berthing of the LNG Carrier at the time of gangway placement.

4. Port Navigation - Marine Operations

This chapter considers the principal features and constraints in the port approach to the Terminal and in accordance with the Elefsina Port Authority requirements.

4.1 Pilotage

The Piraeus Port Authority is the Greek State authority regarding harbour pilotage at Revithoussa. **Pilotage is compulsory for all LNG Carriers arriving at and departing from the Terminal** (Communication VHF ch. 68 or 6), except for emergency situations where the LNG carrier Master is authorized to proceed to emergency departure without pilotage.

The Terminal's Pilot boarding on vessel area is located about 2 NM west of the Terminal's jetty area in the temporary anchorage area.

Local Pilots assist the LNG Carrier's Master who has and retains the full responsibility at all times for the LNG Carrier's safe approaching and berthing at the Terminal facilities.

4.2 Tugs

Berthing and unberthing operations are accomplished with tug's assistance (outsourcing service appointed by the Ship's Agent of the Vessel).

Tugs shall at all times be designed, constructed, equipped, operated, and maintained so as to remain in compliance with the applicable Greek Law Code as incorporated by the Presidential Decree 83/2022 as amended.

The BP of the tugs serve at Revithoussa LNG terminal should be according to the following tables:

Minimum number of tugboats required as a function of size (LOA) and total required BP for mooring-unmooring and with-without thruster cases (Wind speed 19 knots):

Size LOA (m)	Without thruster			With thruster		
	Total Required BP (tn)	Mooring	Unmooring	Total Required BP (tn)	Mooring	Unmooring
150-200	40	4x40	3x40	24	4x40	3x40
200-250	68	4x40	3x40	47	4x40	3x40
250-300	106	2x50 2x40	2x50 1x40	77	2x50 2x40	2x50 1x40
300-350	116	2x60 2x50	2x60 2x50	116	2x60 2x50	2x60 2x50

Minimum number of tugboats required as a function of size (LOA) and total required BP for mooring-unmooring and with-without thruster cases (Wind speed 24 knots):

Size LOA (m)	Without thruster			With thruster		
	Total Required BP (tn)	Mooring	Unmooring	Total Required BP (tn)	Mooring	Unmooring
150-200	66	4x40	3x40	50	4x40	3x40
200-250	111	4x50	3x50	90	4x50	3x50
250-300	175	4x60	4x60	146	4x60	4x60
300-350	191	4x70	4x70	191	4x70	4x70

Specifically, every tug served at Revithoussa LNG Terminal should be compatible with the following requirements:

- For safety reasons, the minimum bollard pull of any tugboat operating at the Revithoussa LNG Terminal should not be less than 40 tons.
- The minimum firefighting requirements should be aligned with those of recognized classification societies that are members of IACS, and the tugboats should have a certified firefighting capability of at least FiFi-1.
- The tugboats operating at the terminal should have ASD propulsion technology. If tugboats with ASD propulsion technology are not available, the terminal will continue to accept tugboats employing alternative technologies until 2028, in order to provide the fleet with

adequate time to comply with the upcoming requirements.

- The age of tugboats operating in Revithoussa should not exceed thirty (30) years.
- The ship-owning or managing companies should have ISO9001 and ISO14001 certification.
- The tugboats operating in Revithoussa LNG Terminal should be insured with membership of the International Group of P&I Clubs.
- The replacement of a tugboat attached to the bow and/or stern of the vessel with another tugboat with lower BP than specified in the above tables is not accepted.
- For size classes 250–300m and 300–350m, the bow and stern tugs should have a minimum bollard pull of 60T BP.

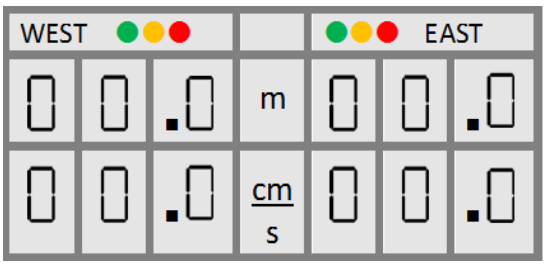
4.3 Approaching

Pilot and Master of the LNG Carrier should:

- have as principle to stop the LNG Carrier in parallel position and in a distance more than 50m to the fendering line and bring her by pushing and/or pulling in parallel onto the jetty fenders.
- be aware of the max berthing velocity limit **10cm/sec** but a lower speed of **5 cm/sec proposed for all berthing operation.**

The Terminal's docking system provides continuous monitoring of approaching distance and velocity of the LNG Carrier which are displayed on approaching panel with large read-outs set assisting LNG Carrier's Master / Pilot during berthing.

A set of traffic lights (green, yellow and red) with siren signal informs of the approaching speed of the LNG Carrier and its figures shown below:



Position	Displayed data
Top Left	Current distance from the jetty to the vessel as measured by the left Sensor
Top Right	Current distance from the jetty to the vessel as measured by the right sensor
Bottom Left	Current speed of the vessel in relation to the jetty as measured by the left sensor
Bottom Right	Current speed of the vessel in relation to the jetty as measured by the right sensor

The lights switched on in the limits shown in the table below:

Approaching Speed	**0-9 cm/s**	**10-14 cm/s**	**15 cm/s and over**
Color of traffic light	Green	Yellow	Red

4.4 Mooring / Unmooring

4.4.1 Mooring arrangement

The Terminal's indicative schemes for mooring lines arrangement and minimum number of lines is as follows:

Vessel up to 300m	Vessel over 300m
16 lines	18 lines
2 Spring lines aft/fwd	2 Spring lines aft/fwd
3 Breast lines aft/fwd	4 Breast lines aft/fwd
3 Head line aft/fwd	3 Head line aft/fwd

Mooring arrangements should fulfil OCIMF weather criteria and should have been agreed between Terminal and the LNG Carrier on the stage of the compatibility study and must be followed by the LNG Carrier's Master/Pilots/mooring crew.

Details of the mooring hooks and arrangement are shown in Att. 1 of this Manual (and an integral part of it).

Certification of all mooring lines/tails/winch brakes should be available on board and be provided to the Terminal Representative at any request.

4.4.2 Mooring Operation

The LNG Carrier's crew deploys the mooring lines in accordance with the LNG Carrier's Master and pilot's instructions and the agreed mooring plan.

Mooring operation is carried out with the assistance of two properly manned mooring boats one at bow and one at stern of the LNG Carrier. Two mooring gangs at each side of the jetty assist and put the lines at corresponding hook as Pilot/LNG Carrier's Master instructs.

Mooring lines are transferred one by one from each mooring boat to the corresponding mooring hook at the berth. Lines are tensioned after putting all lines on each mooring dolphin.

The mooring crew on boat and the jetty should be equipped with proper PPE and wear lifejackets.

4.4.3 Mooring Lines Monitoring

With respect to mooring plan while alongside, the LNG Carrier and her Master must ensure that:

- The LNG Carrier is safely moored all the time

- A sufficient number of deck watch keepers are on duty to tend the mooring lines.
- Line tending operations are carried out as appropriate to ensure the LNG Carrier is held firmly alongside in its correct position with respect to the hard arms. Line tending checks also ensure that mooring lines do not become too slack or too taught
- When the LNG Carrier is secure at the berth, the mooring winch brakes are properly hardened up and the winch is taken out of gear

All Terminal mooring hooks are equipped with load sensors and all measurement values are collected to the central control room of the Terminal for continuous monitoring.
Line tension monitoring system has adjustable set points for slack, warning and high load which are shown on the table below:

MH	SLACK	WARNING	HIGH HIGH
MH 1-6	5 MTons	30 MTons	60 MTons
MH 7-10	5 MTons	30 MTons	40 MTons

All above set points can be adjusted as per mooring arrangement for each LNG Carrier.

When the LNG Carrier is alongside the mooring line tension system should always be alive and shall be carefully monitored by Terminal panel operator. The LNG Carrier control room can at any time request and receive advice from the Terminal regarding the recorded values.
Slack or over tension of lines should be immediately referred to the LNG Carrier control room for proper readjustment of lines.

4.4.4 Unmooring

Prior to the commencement of unmooring the LNG Carrier's Master/Ship's Agent shall ensure that the pilot is onboard and tugs, mooring boat/gangs are in attendance and ready to commence unmooring.
Unmooring operations are carried out by LNG Carrier's Master/Pilot instructions and all assisting services should follow the instructions.
Terminal's Shift Supervisor and/or Terminal Representative will watch the unmooring at the jetty area.

4.5 Stand-by Tugs

While an LNG Carrier is alongside, tugs with appropriate power should be stand by at the special mooring buoy 300 meters west of the LNG jetty or at 10 min notice of arrival at jetty area.

The master of each tug must always be ready for action and keep a listening on VHF Channel 68 while the LNG Carrier is alongside. Stand-by Tugs requirements are shown at the following table:

Size LOA (m)	BP of stand by tugs
150-200	1x50
200-250	1x50
250-300	2x60
300-350	2x70

5. Safety Access Security

The regulations are framed by providing guidance to the LNG Carrier and Terminal personnel so that safe and efficient port operations can be achieved.

5.1 Communications

5.1.1 VHF/UHF Radio Communications

Hand-held VHF/UHF intrinsically safe radios should be provided by the LNG carrier to enable operational communication between Terminal staff and LNG Carrier's crew outside their respective control rooms.

A multi-channel marine VHF radio should be available in the control room for communication with the Terminal, the port authority and other relevant bodies whilst the vessel is alongside.

For LNG Carrier/shore communications after gangway placement and Terminal staff is onboard, the radio system UHF is the primary source of communication.

Terminal, for each unloading provides an approved type of radio device (UHF), a spare Battery and a charger.

VHF/UHF Channels used:

Pilot station	VHF channel 68
Terminal Control Room	VHF channel 68 and UHF channel 06
Port Authority	VHF channel 07

5.1.2 Telephone Lines

Two telephones are available on the LNG Carrier through shore link

- one hot-line telephone and
- the other connected to the public system.

	Internal call
Plant Manager	2320
Terminal Representative	2319 2314
Operation Manager	2324
Main Control Room	2350 2355

5.2 Weather Forecast and Weather Monitoring

Terminal Representative before each LNG Carrier's acceptance for berthing should advise the weather forecast for at least 24 hours before carrier approaching (weather forecast is available from National Meteorological Service, NMS).

Weather monitoring stations are also installed at Revithoussa LNG Terminal with continuous measurement of the wind speed / direction, wave height / peak period, tides etc. Terminal Representative continuously advises this weather station located at main control room for his/her decision to continue, postpone and/or cease all the operations, in case of adverse weather.

5.3 Terminal Weather Limits /Adverse Weather

5.3.1 Weather and Warning restrictions for berthing /Unberthing

5.3.1.1 For Vessels with LOA up to 300m and draft up to 12 m

Berthing is not permitted under the following conditions:

wind speed is over **25** knots
forecasted winds are greater than **40** knots
wave height is over **1,2 m**
horizontal visibility at the jetty is less than **1** nautical mile
an earthquake warning has been issued

5.3.1.2 For Vessels with LOA over 300m and draft up to 12 m

Berthing is not permitted under the following conditions:

wind speed is over **20** knots
forecasted winds greater than **40** knots
the wave height is over **0,6 m**
horizontal visibility at the jetty is less than **1** nautical mile
an earthquake warning has been issued

5.3.2 Weather restrictions for stop unloading/disconnection of arms/unberthing

The following actions must take place in case of bad weather conditions:

Action	Weather conditions
Cargo stoppage	30 knots and rising and/or Electrical storms
Hard arm disconnection	35 knots
Unberthing	forecasted wind is above 40 knots
Resumption of cargo discharge	20 knots and falling

In case of forecasted winds above 40Knots and while the vessel is at berth, early notice of calling tugs (except stand by tugs) must be done to assist vessel to leave the berth, especially for south winds.

For safe departure of the vessels the weather limits referred at 5.3.1 and 5.3.2 paragraph above should be followed.

5.4 State of Readiness/Emergency Departure

LNG Carrier's Master shall ensure that:

- the LNG Carrier's engines must be maintained at full readiness at all times.

keep always positive stability with propeller and rudder are full immersed to allow the LNG Carrier to leave the berth at short notice if so required in an emergency.

Emergency Departure

If emergency departure from the berth is required, this is carried out by the LNG Carrier Master without the aid of a pilot and mooring boats/gangs by prior consultation of Terminal and Port Authority.

In the event of a severe Emergency situation (E) involving fire on the jetty during cargo unloading, the LNG carrier must stop all cargo operations immediately and must leave the jetty in sort notice (emergency departure).

In the event of a severe Emergency situation (E) involving high wind/waves conditions causing cargo sloshing, the LNG carrier could ask to remain at berth for a limited time, in order to handle cargo level in tanks to avoid sloshing effects. In this case the Terminal must delay releasing the LNG carrier's mooring lines until the Master confirms that the ship is ready to sail.

Stand by tug (s) should assist the emergency departure, under the instructions of carrier's Master.

5.5 Engine Safety

Unloading arms may not be connected until the LNG Carrier confirms that main engine(s) is/are off operation.

Similarly, main engine warm up may not commence until all unloading arms are disconnected.

5.6 Repairs or Maintenance Works

Repair and maintenance works involving either hot work or cold work are prohibited on the LNG Carrier and jetty unless prior written permission is obtained from the Plant Manager and the Port Authority.

Repair and maintenance works should be granted in advance at least 72 hours before arrival and not during cargo operation. At these times, the Terminal precautions require the Work Permit system to be strictly followed. If unavoidable breakdown occurs to the LNG Carrier, then repairs may be permitted with the LNG Carrier remaining alongside after receiving a written approval from the Terminal Manager.

In cases where the LNG Carrier's mobility is affected, permission to remain alongside is conditional, upon the LNG Carrier's Master hires an additional tug so the LNG Carrier may be moved and Port Authority informed accordingly.

5.7 Emergency Towing

Based on SIGTTO recommendations it is not compulsory for the vessel to put in place the Emergency Towing Wires. "Except at terminals where no tugs are available, towing off wires of adequate strength and condition should be made fast to bollards on the tanker, forward and aft, and their eyes run out and maintained at, or about, the waterline**".**

5.8 Leakage, spillage of LNG and Fire Fighting

Means of protection shall be provided on the LNG Carrier to minimize the consequences of spillage and leakage of LNG. This may be by provisions for containment of LNG spill, brittleness protection of carbon steel structural members, a water curtain or other appropriate measures. Closed-circuit monitoring systems may be used as an aid in the detection of leakage. The LNG Carrier's fire and gas detection system and fire-fighting equipment as specified by the SOLAS Convention (as incorporated by Greek Law 1045/1980 as amended) and the IGC Code (as incorporated into Greek Law by Law 2208/1994 as amended and by Ministerial Decision no. Υ.Α.

4113.213/01/2007/2007) should be fully operational at all times and ready for immediate use as stated in the LNG Carrier/shore safety checklist.

Safety plan complying with applicable IMO conventions should be available on board the LNG Carrier.

A plan showing the location and type of all fire-fighting equipment on or adjacent to the jetty should be permanently displayed at the berth, along with any necessary instructions and fire- fighting procedures.
Measures shall be provided to protect personnel, structures and essential equipment from a fire so that the risk of escalation of an incident is minimised. These measures should include water spray, water monitor or passive fire protection measures.

Water monitors and sprays shall be capable of being operated from a safe location. Water sprays can be effective in limiting the migration of gas clouds.

5.9 Personal Protective Equipment

During all operations, as appropriate, all people involved, either on board the LNG Carrier or ashore shall wear:

- Hard hats
- Eye protection
- Leather gloves
- Safety shoes
- Long-sleeved overalls
- Lifejackets, when working close to the water's edge.

5.10 Control of Ignition Sources

Smoking

Smoking is prohibited and limited at approved locations clearly designed on board, and specified at the LNG Carrier/Shore Safety Check List. These locations must be situated in the accommodation and without doors, windows or portholes that open directly onto the open deck.

Matches, Lighters and Battery Operated Equipment

Persons involved in cargo handling operations are prohibited from carrying any articles that may cause sparks, such as matches or cigarette lighters. The use of battery-operated equipment (including cameras, mobile telephones, torches etc), outside of safe zones, is prohibited, unless authorised by the Terminal Manager for a specific purpose.

LNG Carrier visitors may carry mobile telephones and pagers through the Terminal, but during transit of the Terminal and jetty's Hazardous Areas, the battery must be disconnected and carried separately.

Accommodation Doors and Portholes

All external doors and portholes leading into the LNG Carrier's accommodation and machinery spaces must be closed during cargo operations. Doorways at the boundary between the LNG Carrier's open decks and the accommodation must be fitted with a double-door type entrance. The inner door must be fitted with a self-closing device and kept closed.

Vent Fans and Air Conditioning Units

The air intakes on the central air conditioning must be adjusted to prevent ingress of hydrocarbon gas. This is achieved by switching the system to internal re-circulation.

Window-type Air Conditioning Units

Window-type air conditioning units must be electrically disconnected and external events or air intakes covered or closed.

The LNG Carrier's Main Radio Station

While the LNG carrier is alongside the jetty, the LNG Carrier is not permitted to transmit using its main or emergency radio transmitters and the wireless aerials must be earthed. If necessary, during statutory surveys onboard, the radio transmissions can be tested using the dummy load facility.

Only low power radio equipment of a fixed nature, such as VHF sets and satellite communication equipment, can be used while alongside.

5.11 Drugs and Alcohol

As part of the prequalification requirements before the LNG Carrier is permitted to call at the Terminal, the LNG Carrier and LNG Carrier Interests must have in place an effective drug and

alcohol abuse policy, a copy of which must be posted onboard. This drug and alcohol abuse policy must meet or exceed the standards specified in the *OCIMF Guidelines for the Control of Drugs and Alcohol Onboard LNG Carrier*.

Whilst the LNG Carrier is within the Terminal's operational limits:

(a) this drug and alcohol abuse policy must be strictly observed and the Master must ensure that no restricted drugs (other than those in the medical locker) are onboard and that no alcohol is used or is available for use and

(b) the LNG Carrier's Master and crew must have a zero blood alcohol level whilst the LNG Carrier is approaching, berthing, staying at berth, unberthing and sailing away from the Terminal.

5.12 LNG Carrier's Stores

Provided operations are not delayed, the loading of LNG Carrier's stores and spare gear is permitted while the LNG Carrier is alongside. The Terminal requires an agreed plan to be prepared at the Pre-Discharge Meeting to cover storing requirements and that storing operations are programmed for periods when the operation of discharging is not in progress.

During cargo Operations, storing craft/service boat coming alongside the LNG Carrier is not permitted.

All large deliveries must not be loaded when the LNG Carrier is alongside.

5.13 Access and Security

5.13.1 LNG Carrier Access

LNG Carrier's Master should have in place safe means/equipment for all persons to embark/disembark the LNG Carrier from seaside in normal situation and/or in case of an emergency.

Pilot and/or accommodation ladder and lifeboat should be in place as per international standards imposed.

LNG Carrier access from Terminal is provided by a gangway tower and a satellite ladder placed onboard under supervision of deck watch crew.

Terminal gangway is placed between manifold area and accommodation building, only in case of port side berthing position of the LNG Carrier. For easiest and safely access/evacuation of the LNG Carrier this is the preferable berthing side at Revithoussa LNG Terminal.
When vessel is alongside jetty gangway there should be always continuous monitoring from deck crew and Terminal jetty man.

5.13.2 LNG Carrier's Crew and Visitors

Procedures shall be in place to ensure the safe and controlled access of authorized visitors to the LNG Carrier. These may include, but are not limited to, LNG Carrier's agents, customs and immigration officials, owners, representatives and superintendents, LNG Carrier's chandlers, vetting inspectors and crew reliefs. Authorisation for visitors to the LNG Carrier shall be given by the LNG Carrier's Master.
These procedures shall be in compliance with the requirements of the IMO's ISPS Code (as incorporated by Presidential Decree with no. 56/2004, Regulation (EC) 725/2004 and EU Directive 2005/65 as incorporated with Greek Law 3622/2007).
The Ship's Agent is required to pass a copy of the LNG Carrier's Crew List to Terminal Representative and Port Facility Security Officer.
LNG Carrier's crew and visitors are not allowed to walk through the Terminal facilities without the Terminal's prior permission and without accompanied by the Terminal's authorised staff.
Only authorised persons, or those with prior entry permits issued by the Terminal, are allowed through the security guard at the Terminal's main gate.

All LNG Carrier's visitors through the Terminal facilities announce their arrival beforehand either to the Master or to the Ship's Agent. The Master or Ship's Agent shall then inform the Terminal by providing a Visitor's List with full name and copy of valid ID cards/passports, so that Terminal Passes can be properly completed in advance of the visitor's arrival from the Terminal/Port Facility Security Officer (PFSO). This procedure applies equally to all persons embarking/disembarking LNG Carrier using Terminal facilities.
Persons who appear to be under the influence of alcohol or drugs are not allowed to have access to the Terminal and its facilities and embark/disembark LNG Carrier.

5.13.3 ISPS Security

Terminal operates under the International LNG Carrier and Port Facility Security (ISPS) Code, SOLAS Convention (1974/1988) as amended from time to time on minimum security arrangements for LNG Carriers, ports and government agencies.

Declaration of Security should be announced, filled and signed by Port Facility Security Officer (PFSO) in case the Security Level is different than the Level 1.

Security issues arising during marine operations should be referred immediately to Terminal Control Room and/or Terminal Representative.

6. Environmental Regulations

All applicable International Convention MARPOL 73/78 for the Prevention of Pollution from LNG Carriers incorporated into Greek Law by L. 1269/1982 as amended should be followed at all times.

The LNG Carrier's Master should have in place in written an approved SOPEP (LNG Carrier oil pollution emergency plan, and a valid Oil Pollution Prevention Certificate (IOPP) (as per the Greek Ministerial Decisions 2431.02/10/2007, 2431.02.1/02/07/2007 and 2431.02.1/05/2010).

The LNG Carrier's Master is responsible for preventing any kind of pollution of the sea or atmosphere (bunkers, LNG, bilge water, dirty ballast, plastics, garbage, or any other matter that results in the pollution).

Any incident of pollution should be immediately referred to Terminal Control Room and the Port Authority.

6.1 Oil Pollution

No oil or mixture containing oil is allowed to escape from a LNG Carrier while within Greek waters and Ports.

If floating oil is found in the vicinity, both LNG Carrier and Terminal inform each other regarding the facts. The matter must be immediately notified to the Port Authority at Elefsis.

Blanking Unused Manifold Connections

Unused cargo and bunker manifolds must be properly blanked and have their manifold valves closed. Blank flanges are fully bolted and other types of fittings, if used, are properly secured.
Deck scuppers, drain holes, and drip trays on the LNG Carrier within the vicinity of any potential pollution area must be suitably plugged and any accumulated water or effluent drained off as required.

Bunkering

The loading of bunker fuel and diesel oil is not permitted while an LNG Carrier is alongside the berth and carrying out any internal transfer of bunker oil isn't allowed.

6.2 Ballast Water Discharge

Only clean segregated ballast is allowed to be discharged from the LNG Carrier when it is alongside the Terminal berth and only if this is absolutely necessary by prior permission of Port Authority and Terminal.

All LNG carriers should comply with the BWM convention and should have an International Ballast Water Management Certificate and maintain a Ballast Water Management System with approved Ballast Water Management Plan and procedures, Ballast Water Record Book (IMO), properly filled and should be provided at any request by Terminal and/or Authorities.

6.3 Air emissions

Every LNG Carrier calling at the Terminal should comply with MARPOL Annex VI (October 2008) (as incorporated into Greek law by Presidential Decree with no. 14/2011 as amended).

Natural gas/Boil off and/or low sulphur fuel oil should be used as fuel when the vessel is alongside.

Venting Cargo Vapours

While the LNG Carrier is within port limits, the venting of cargo vapours to atmosphere is strictly prohibited.

Inerting, Purging and Gas Freeing of Cargo Tanks

LNG Carrier's personnel must not inert, purge or gases free a cargo tank while alongside the Terminal.

If such actions become necessary, operation MUST be stopped and the LNG Carrier must proceed outside port limits to carry out such works.

6.4 Port Reception Facilities for Waste Oil and Garbage Disposal

No garbage or other materials, either liquid or solid, shall be discharged overboard from a LNG Carrier, but must be retained in suitable receptacles on board until special arrangements are made for disposal by authorized subcontractors. Port Authority has approved contractors for the removal and reception of limited quantities of bilge water and oils.

LNG Carriers wishing to make use of this service via LNG Carrier's Agent, arrange for disposal by providing prior information of Terminal and Port authority.

7. Cargo Handling and Supervision

The Terminal regulations in this chapter are based on safe working practices widely accepted in the LNG industry and are aimed at the prevention of accidents. These procedures are framed to provide guidance to LNG Carrier and Terminal personnel so that efficient port operations can be achieved.

Once the LNG Carrier is alongside, the responsibility for cargo handling is shared between the LNG Carrier and the Terminal and the following should be decided and agreed:
When the LNG Carrier is alongside the Terminal, cargo operations shall not begin unless and until the LNG Carrier's Master has:

- acknowledged and signed the acceptance of these procedures/Manual and Conditions of Use (Attachment 5)
- Inspection and completion of the LNG Carrier/Shore Safety Check List (Appendix 2)/or LNG Carrier's corresponding,
- posted a Gangway Safety Notice
- posted the LNG Carrier's Fire Fighting plan at deck
- water curtain at manifold is in operation.

7.1 Pre-Discharge Meeting

Pre-Discharge Meeting is being held between the LNG Carrier and the Terminal to ensure that all aspects of the Cargo handling and supervision issues are covered. In this Pre-Discharge Meeting, the LNG Carrier's chief officer and/or LNG Carrier's Master, the Terminal Representative and the Shift leader of the Terminal should participate.

In this meeting at least the issue below should be discussed and agreed:

- Review the results of the *LNG Carrier/Shore Safety Checklist* inspection
- Review Communication means/check
- ESD testing procedure and sequence
- Unloading Arms cool-down procedure
- Cargo and ballast handling Procedure / Partial Unloading
- Procedures main steps and estimated required time

- Heel and/or stripping requirements
- Emergency Procedures, including emergency departure plan
- Communication and details of Stand-by Tug
- LNG Carrier's visitor's entry
- Service boat approach for disembarkation/storing requirements
- Note the name of the standby safety boat and methods of communication.

Pre-discharge meeting agenda is shown in appendix 1 and provided by Terminal.

7.2 Notice of Readiness to discharge

At the end of the Pre-discharge meeting the LNG Carrier's Master and Terminal Representative should agree that everything has been checked and also checked the status of carrier cargo tanks (pressure/Temperature) and give Notice of Readiness to discharge stating the time/date that the LNG Carrier is ready to commence discharging cargo.

7.3 Cargo Operation and Supervision

The supervision of cargo handling operations both on the LNG Carrier, and within the Terminal is carried out between Chief Officer/LNG Carrier Control Room and Shift Leader Shift Staff/ Terminal Control Room.

LNG Carrier's and Terminal's Control Room remotely monitor all operation and LNG Carrier's manifold and jetty are always monitored through a closed circuit television system (CCTV).
When a LNG Carrier is alongside, the LNG Carrier manifold/deck and jetty/shore are always monitored by checking:

- the condition of the manifold/ hard arms
- for any leakage of LNG and/or vapour
- position of unloading arms (PMS system on line on jetty pulpit)
- temperatures, pressures, flow at manifold/hard arms
- position of the gangway
- mooring lines status
- mooring hooks status
- that always the water curtain on LNG Carrier manifold is working properly
- continuously check the unloading rate, cargo remaining on board to discharge and position the LNG Carrier on jetty (draft, trim, list) and movement of the loading arms.

Any deficiency MUST be immediately referred to the Terminal control room and LNG Carrier Control Room and Terminal Representative.

7.3.1 Terminal staff roles and responsibilities for Unloading Operation

Terminal staff involves mainly at Unloading operations and role and responsibilities are described in this section.

Terminal Representative

Terminal Representative on duty will be present at all operations and mainly (not exhaustive list):

- Be informed of all issues agreed in the compatibility study between Terminal / LNG carrier and their implementation
- Be aware of the implementation of the procedures described in this Manual
- Be the contact person for any matter concerning the LNG Carrier from arrival to unberthing
- Receive the weather forecast and decide to accept LNG Carrier for berthing or postpone it
- Attend the berthing, mooring operations/according to mooring plan agreed
- Accept and sign Notice of Readiness (NOR)
- Perform safety meeting on board of the LNG Carrier together with her Master or Chief Officer
- Perform the safety round tour on board
- Check, fill and sign the LNG Carrier-shore safety checklist
- Attend all operations to check that same are done according to the Terminal procedures
- Witness and sign the opening and closing of the CTMS
- Be present at the post meeting with Master and/or chief officer

Terminal Representative can stay at all times of operations at LNG Carrier Cargo Control Room and/or after stabilizing discharging flow rate he/she can leave the LNG Carrier Cargo Control

Room, in any case he/she should be available on any request from Terminal and/or LNG Carrier. Terminal control room and Shift Supervisor hand over, monitor and follow up the operation.

Shift Supervisor

The Shift Supervisor on duty will perform mainly the following (not exhaustive list)

- Attend the Berthing and mooring operations
- Perform the Technical meeting with chief officer and discuss main step of the operations
- Supervise that all the operation is done according to Terminal procedures and inform Terminal Representative for any abnormal situation

Shift Supervisor is also the Leader of any emergency situation to follow and execute the Emergency plan of the Terminal.

Panel Operator

Terminal control room will be manned at all times and the Panel Operator:

- Follows-up the whole unloading/reloading operation through DCS and fills all check lists concerning the unloading operation
- Is in contact with field operators and LNG Carrier control room
- Instructs accordingly field operators by giving the feedback from their actions on the field and of any signal arise on DCS
- Performs the ESD test in communication with the LNG Carrier cargo control room and they give each other feedback of good working
- Receives all information of the LNG Carrier cargo control room and cooperates during all operation, keeping records for the operations
- Monitors the operation from close circuit television system (CCTV)

Terminal control room is also the emergency control room in case of any Emergency.

Field operator/Jetty man

When the LNG Carrier is alongside jetty, it is always manned and jetty man monitors:

- Condition of the manifold/ hard arms
- Position of unloading arms (PMS system on line on jetty pulpit)
- Temperatures, pressures, flow at manifold/hard arms
- Position of the gangway
- Mooring lines status
- Mooring hooks status
- Water curtain on LNG Carrier manifold is always working properly

He/she is in continuous contact with Terminal Control Room and/or Shift Supervisor and immediately informs every party about any abnormal situation.

7.4 Connections Terminal and LNG Carrier

7.4.1 Earthing/ESD Communication Link/Fire Hose

Jetty man and LNG Carrier crew on deck are cooperating to connect:

- Earthing cable (screw type),
- LNG Carrier shore interconnection cable (electrical) /ESD cable / communication (should be switched on before ESD test)
- Fire hose international connector (no under pressure)

7.4.2 Unloading Arms Connection

By checking the insides and outsides of the manifolds to be free from foreign debris and appropriate filter (60mesh) from LNG Carrier side to put in place, the jetty man manoeuvres the hard arms into position adjacent to the appropriate LNG Carrier's manifold. All arms are equipped with Quick Connect/Disconnect Couplers (QC/DCs).

7.5 Leak Test and Oxygen Purge

Purging and leak test of the hard arms/LNG Carrier's manifold is done with nitrogen provided by the Terminal.

The hard arms are pressurised with nitrogen and the pressure is released to the LNG Carrier's deck area using vent valves or drain valves of the LNG Carrier's manifolds.

Liquid pipelines are pressurized up to 5 barg, and vapour pipeline to 1 barg.

Testing no leakage is done by applying a soapy water solution to the principal joints and free of air by measuring oxygen content to be less than 1 % by volume.

7.6 Initial Cargo Measurements (opening CTM)

All Users bringing cargo to the Terminal should be aware of Hellenic Regulation of Measurement LNG cargo [Law 4001/2011 as amended and Decision No. Δ3/A/20701 of 2006 (– Government Gazette 1712 B' 2006) and ESFA Code as amended – last amendment in 2017].
For custody-transfer measurement the LNG Carrier should have on board

- Certified/calibrated custody transfer measuring system primary and secondary with appropriate accuracy (level, pressure and temperature)
- Calibrated gas meter for gas consumption at LNG Carrier engines
- Approved cargo tanks volumetric and correction tables
- Pre-cooled unloading lines should be drained
- Close vapour manifold valve
- Zero trim and list

The initial cargo measurement shall be made before ESD and cool down of the LNG Carrier's unloading lines/ Terminal arms and before communicating the vapour phase of the LNG Carrier and the Terminal.
The measurement is done in the presence of chief officer, Terminal's representative and third-party surveyor as Users had agreed and authorized.

7.7 Vapour system

Free vapour flow by pressure difference is performed between Terminal and LNG Carrier's tanks. For this reason, LNG Carrier should keep the pressure of cargo tanks as low as possible so as the difference of pressure to be adequate for receiving the adequate volume of vapour return.

7.8 Emergency Shut-down Test

Two warm emergency shutdown tests are performed, one from LNG Carrier's control room and one from Terminal's side.

The communication should be done between LNG Carrier's control room and Terminal's control room for the tests of ESDs.

All unloading lines of the Terminal are kept in cold conditions except the unloading arms, for that reason in case of cold ESD test only double valve of unloading should be tested (functional test).

Time closure of Terminal ESD valves is within 30 seconds.

7.9 Cool-down of Hard Arms

Cool-down of the hard arms is carried out in close co-operation between LNG Carrier and Terminal's personnel as discussed and agreed in the pre-discharge meeting.

After confirmation that both LNG Carrier and Terminal's liquid lines are lined up and they are ready to commence cool down procedure:

- The LNG Carrier starts spray pumps on the request of the Terminal
- The Terminal shift leader in cooperation with jetty operator and LNG Carrier adjust the cool down flow rate according the progress of cool-down.
- Cool down of the arms is completed when their temperature reach at -130^{o}C.
- Checks are made to ensure nitrogen is flowing through the hard arm swivel joints.

7.10 Starting Cargo Pumps

Both LNG Carrier and Terminal maintain close contact and cargo pumps start as follows:

- The LNG Carrier opens all valves in its liquid pipeline and closes the cool-down valves at the manifolds
- The Terminal confirms that all valves in the liquid pipeline are open and that the pipeline is in a proper condition to receive cargo
- LNG Carrier gives 5 minutes to the Terminal control room before starting each pump. Increasing of unloading rate should be done gradually and the pumps should be started with intervals not less than 5 min (this time can be extended if unusual pressures or any problem arises at terminal and/or carrier)
- LNG Carrier informs Terminal control room when the agreed unloading rate is reached

- Terminal checks the flow rate and they mutually confirm and monitor the flow rate

Any changes to the above due to technical problems and for any other reason should be immediately referred.

7.11 Ballast Handling

LNG Carrier's Ballast should be done concurrently with the unloading of the cargo tanks avoiding the big differences in the draft of the LNG Carrier.

During unloading LNG Carrier's Master and crew should be aware that

- the draft should be kept inside the limits agreed and with respect to berth limitations
- the trim should be in accordance with berth limitations and agreed procedures
- the LNG Carrier must try to maintain a zero list

Ballast handling procedure should be agreed and monitored during unloading operations.

7.12 Cargo Sampling

Continuous sampling system of LNG and discontinuous on line gas chromatography analysis every 5 min is used. Manual sampling and gas analysis at the Terminal lab with gas chromatography are also available.

A 2,5 barg min pressure at unloading lines (max at LNG Carrier's manifold pressure of 5barg) is required in order to achieve best results of cargo sampling and composition analysis.

7.13 Stopping Cargo Pumps

The LNG Carrier gives notice to the terminal

- 5 min before each cargo pumps stops
- when the discharge is completed and all pumps have stopped.

7.14 Drain Liquid Arms and Purge of Arms

Both LNG Carrier and Terminal co-operate to drain all remaining liquid from the liquid arms based on the agreed drain procedure.

- Outboard lliquid arms are drained from Terminal to jetty KO drum
- On the LNG Carrier, liquid in the outboard arms is drained into the LNG Carrier's system by nitrogen pressure supplied by the Terminal
- After three or four times of purging continuous flow of nitrogen purging is done for 4 hours up to complete deicing of the hard arms and nitrogen purge is done from drain valves on LNG Carrier's manifold

Purging flow of nitrogen for deicing purposes can start as soon as the gas content in the flow is less than 3% by volume and measurement should be done by calibrated gas meter with IR sensor (appropriate for measuring in nitrogen atmosphere).

7.15 Final Cargo Measurements (closing CTM) – Close out Meeting

With reference to para 7.6 above final custody-transfer measurement the LNG Carrier is requested by Terminal Representative to be on zero trim/list, all LNG Carrier manifold valves should be closed.

In the presence of chief officer, Terminal representative and third party surveyor closing reports are witnessed and signed.

7.16 Disconnecting Liquid and Vapour Arms

After de-icing of the hard arms (4 hours) the Terminal operator checks that the gas content is less than 2% by volume using gas meter with IR sensor and disconnects one by one each unloading arm.

8. Marine Emergency Procedures

The purpose of this section is to particularise the marine emergency procedures that must be followed at the Terminal.

The priorities here are the protection of human life, the preservation of the environment, the protection of property of all parties involved as well as the Terminal's swift recovery from a casualty and the resumption of Terminal's safe operations as soon as possible.

This emergency procedure should be followed together with the Emergency Procedure/Plan of the LNG Carrier and of the Terminal.

Emergency Procedure should be discussed during compatibility study of the LNG carrier at the interface meeting and agreed and reviewed before each discharging.

8.1 Control of an emergency situation

When an incident occurs at the Terminal involving an LNG Carrier, the Terminal shall be in the overall control of the incident as per the Terminal Emergency Plan existing at the Terminal and any action of the LNG Carrier should be referred to the Terminal's control room.

An incident involving only the LNG Carrier, shall be under the LNG Carrier's Master's control, on the basis that there is no threat to the Terminal, although appropriate assistance shall be provided by the Terminal (if requested) and the incident should be immediately referred (notified) to the Terminal**.**

LNG Carrier must have specific emergency procedures onboard and follow it in any incident and/or emergency.

When the LNG Carrier is berthed at the jetty in addition to her emergency procedures, the Master must also proceed with the following action plan:

- raises an emergency alarm on board
- stops all cargo operation immediately – activate ESD (Emergency Shut Down)
- informs terminal control and terminal representative
- informs port authority/carrier's agent for immediate actions
- initiates carrier emergency plan
- requests stand by tug for immediate actions

-maintains good and constant communication with all related parties
- requests disconnection of the arms if this is considered necessary, clearance of the manifold
- be always in position to take away the LNG Carrier from the berth
- requests from Terminal to be ready to release the mooring lines if this is considered necessary or Terminal asks to remove the LNG Carrier away from jetty.

8.2 Emergency departure/Mooring Lines Release

In case of a severe Emergency situation (E), where it is reasonably evident to the Terminal and/or to the LNG Carrier that as a matter of safety the LNG Carrier must depart the jetty, the LNG carrier must leave the jetty in sort notice (emergency departure).
In case of disagreement between the Master and the Terminal of LNG carrier early departure, the Terminal's view shall prevail and be accepted without reservation by the Master of LNG Carrier. However, in the latter case the Terminal must delay releasing the LNG carrier's mooring lines until the Master confirm that the ship is ready to sail.

Control of this early emergency departure of LNG carrier is in the LNG Carrier Master's hands who must ensure at all times that at least the following must take place together with LNG carrier emergency procedure of early departure:

- the LNG Carrier's engines are in a State of Readiness
- ability to move the LNG Carrier without pilot's assistance and additional tugs, if this assistance cannot reach the LNG Carrier in due time
- sufficient crew is maintained on board the LNG Carrier to handle the situation
- emergency towing wires are in place and in good condition
- a safety tug is on stand-by and at the Master's orders
- communication with the Terminal control room and Terminal Representative, Agent and Port Authority is maintained by any means of available communication (UHF, VHF, telephone etc)
- requesting from Terminal emergency unloading arms release (PERC system/ESD2)
- requesting from Terminal mooring lines release one by one

Initial actions which should be followed by LNG carrier in conjunction with her emergency procedures in case of an incident and/or in an emergency departure procedure should be posted onboard when the LNG Carrier is alongside at the jetty (appendix 3).

8.3 Emergency Communications

Communications		
Terminal/LNG Carrier communications by LNG Carrier/shore radio		
UHF ch. 6		
In case of failure use either telephone or Marine VHF		
	Telephone Numbers/email	**VHF Channel**
Terminal	+30-213-0-885350 +30-213-0-885355 +30 6947877554 +30 6945111118 DesfaLNG@DESFA.GR	68
Port Authority	105 +30 210-5565520 +30 210-5565580	07
Stand by tug		68

8.4 Incident Categorization and Initial Actions

The table below lists emergency scenarios at the LNG Carrier/Terminal interface and particularises basic initial actions regarding cargo discharge and hard arm operation expected in each case. **As shown, all scenarios require cargo operations to cease**. The letters 'E' and 'C' indicate if the action is taken on an emergency basis ('E') or whether it is carried out under 'normal' controls ('C').

	Source	Emergency	Stop discharging	Purge arms	Disconnect arms	Unberth
EMERGENCIES	**LNG Carrier**	LNG Carrier Break-out from jetty	✓		✓**E**	✓**E**
		Single mooring line breakout	✓			
		High mooring line tension alarm	✓			
		LNG Carrier crabbing out of position	✓	✓	✓	
		Loss of electrical power	✓			
		Loss of power to valve controls	✓			
		Loss of instrument air pressure	✓			
		Excess movement from spotting line	✓	✓	✓**E**	
		Cargo tank overflow alarm	✓			
		Liquid nitrogen spill	✓			
		Oil spill	✓			
		Fire (cargo)	✓	✓	✓	
		Fire (engine room)	✓	✓	✓	
		Fire (accommodation store rooms)	✓	✓		
		Leakage	✓	✓		
		Medical evacuation	✓			
		Man overboard	✓			
	Terminal	Fire in Terminal	✓	✓		
		Fire on jetty	✓		✓**E**	✓**E**
		LNG tank overflow alarm	✓			
		Leakage	✓	✓		
		Man overboard	✓			
	Other	High winds	✓	✓	✓	✓**C**
		High wind forecast	✓	✓	✓	✓**C**
		High waves	✓	✓	✓	✓**C**
		Earthquake	✓	✓	✓	

Specific actions must be analysed in the Emergency Plans of the LNG Carrier and of the Terminal. In addition, subsequent actions (Emergency team leader) should be taken depending on the evolution of the incident.

8.5 Specific Incident Scenarios

Specific incident scenarios are described below (with reference to the Terminal Emergency Plan).

Incidents with potential to turn into major events may include the following:

- Fire/Explosion
- Gas/LNG release
- LNG carrier out of position

Specific actions to be taken are referred below.

Incident: **Fire at Terminal Jetty**

LNG Carrier actions

- Stop all cargo operation / verify
- Raise the emergency alarm (in case first observe the fire)
- Isolate all ignition sources and prohibit smoking in all areas
- Initiate emergency plan
- Check wind direction to take / observe direction of the flame
- Initiate water deluge where it is appropriate
- Request stand by tug to assist by checking the wind direction, ask to start fire water monitors
- Request Terminal to assist with fire water monitors of the jetty
- Clear the manifold area and request Terminal to disconnect the arms (ESD2/PERC)
- Preparing for emergency departure (in case of escalation of the fire)
- Keep continuous communication with the Terminal, Port Authority, and Agent.

LNG Terminal actions

- Stop all cargo operation / verify
- Evacuate Jetty area
- Initiate emergency plan (mobilize emergency firefighting team, fire fighting vehicles)
- Isolate all ignition sources and prohibit smoking in all areas
- Check wind direction / observe direction of the flame
- Initiate water deluge where it is appropriate, start fire water monitors in the jetty area
- Use the fire fighting vehicle if it is appropriate
- Inform Fire-fighting Service for assistance
- Keep continuous communication with the LNG carrier, Port Authority
- Inform LNG carrier / Activate emergency release of unloading arms (PERC/ESD2)

- Be prepared to release mooring under LNG Carrier Master advice.

Incident: **Gas or LNG release**

LNG Carrier actions

- Stop all cargo operation /verify
- Isolate all ignition sources and prohibit smoking in all areas
- Initiate emergency plan
- Check wind direction to take the correct decision of the dispersion of the flammable gas
- Initiate water deluge where it is appropriate
- Request stand by tug to assist by checking the wind direction
- Request Terminal to assist with fire water monitors of the jetty if it is appropriate

LNG Terminal actions

- Stop all cargo operation/verify
- Isolate all ignition sources and prohibit smoking in all areas
- Initiate emergency plan (mobilize emergency team and fire fighting vehicles)
- Check wind direction to take the correct decision of the dispersion of the flammable gas
- Initiate water deluge where it is appropriate, start fire water monitors in the jetty area

Incident: **LNG Carrier out of position**

LNG Carrier actions

- Stop cargo operation/verify
- Initiate emergency plan
- Inform port authority and LNG carrier's agent
- Preparing for emergency disconnections of the arms
- Request Terminal to activate ESD2/PERC/ clear manifold area
- Preparing for early departure
- Request Terminal to be ready for releasing mooring lines
- Request stand by tug (s) to be ready for actions
- Keep good communication with Terminal and LNG carrier Agent.

LNG Terminal actions

- Stop all cargo operation/verify
- Inform Port authority
- Initiate emergency plan
- Preparing for disconnection of arms and early departure of the LNG carrier
- Awaiting instruction from LNG carrier Master for releasing the mooring lines
- Watch tension monitoring system of the lines and advice LNG master for the tension
- Request for uptight the tensioned lines
- Keep always good communication with Terminal, Agent.

8.6 Incident Reporting

Brief details of an incident occurring within the Terminal are transmitted to the LNG Carrier.
Brief details of an incident occurring on the LNG Carrier are transmitted to the Terminal.

All marine-related accidents are immediately reported to the Port Authority.
The LNG Carrier and her Master are responsible for any emergency situation arising on board the LNG Carrier and also to notify all incidents on board to the authorities, irrespectively of the Terminal's actions.

APPENDICES

Appendix 1

ISGOTT Checks pre-transfer Ship/Shore Safety Checklist

Date and time: _____

Port and berth: Revithoussa LNG Terminal

Tanker: _____

Terminal Revithoussa

Product to be transferred: LNG

Part 5A. Tanker and terminal: pre-transfer conference				
Item	**Check**	**Tanker status**	**Terminal status**	**Remarks**
32	Tanker is ready to move at agreed notice period (9.11, 21.7.1.1, 22.5.4)	☐ Yes	☐ Yes	
33	Effective tanker and terminal communications are established (21.1.1, 21.1.2)	☐ Yes	☐ Yes	
34	Transfer equipment is in safe condition (isolated, drained and de-pressurised) (18.4.1)	☐ Yes	☐ Yes	
35	Operation supervision and watchkeeping is adequate (7.9, 23.11)	☐ Yes	☐ Yes	
36	There are sufficient personnel to deal with an emergency (9.11.2.2, 23.11)	☐ Yes	☐ Yes	
37	Smoking restrictions and designated smoking areas are established (4.10, 23.10)	☐ Yes	☐ Yes	
38	Naked light restrictions are established (4.10.1)	☐ Yes	☐ Yes	
39	Control of electrical and electronic devices is agreed (4.11, 4.12)	☐ Yes	☐ Yes	Only EX type equipment in use
40	Means of emergency escape from both tanker and terminal are established (20.5)	☐ Yes	☐ Yes	Sea Side L.B and Terminal Gangway
41	Firefighting equipment is ready for use (5, 19.4, 23.8)	☐ Yes	☐ Yes	
42	Oil spill clean-up material is available (20.4)	☐ Yes	☐ Yes	
43	Manifolds are properly connected (23.6.1)	☐ Yes	☐ Yes	
44	Sampling and gauging protocols are agreed (23.5.3.2, 23.7.7.5)	☐ Yes	☐ Yes	
45	Procedures for cargo, bunkers and ballast handling operations are agreed (21.4, 21.5, 21.6)	☐ Yes	☐ Yes	
46	Cargo transfer management controls are agreed (12.1)	☐ Yes	☐ Yes	
47	Cargo tank cleaning requirements, including crude oil washing, are agreed (12.3, 12.5, 21.4.1)	☐ Yes	☐ Yes	See also parts 7B/7C as applicable N/A

Part 5A. Tanker and terminal: pre-transfer conference (cont.)				
Item	**Check**	**Tanker status**	**Terminal status**	**Remarks**
48	Cargo tank gas freeing arrangements agreed (12.4)	☐ Yes	☐ Yes	See also part 7C N/A
49	Cargo and bunker slop handling requirements agreed (12.1, 21.2, 21.4)	☐ Yes	☐ Yes	See also part 7C N/A
50	Routine for regular checks on cargo transferred are agreed (23.7.2)	☐ Yes	☐ Yes	
51	Emergency signals and shutdown procedures are agreed (12.1.6.3, 18.5, 21.1.2)	☐ Yes	☐ Yes	Terminal: Siren Warning
52	Safety data sheets are available (1.4.4, 20.1, 21.4)	☐ Yes	☐ Yes	
53	Hazardous properties of the products to be transferred are discussed (1.2, 1.4)	☐ Yes	☐ Yes	
54	Electrical insulation of the tanker/terminal interface is effective (12.9.5, 17.4, 18.2.14)	☐ Yes	☐ Yes	Earthing Cable
55	Tank venting system and closed operation procedures are agreed (11.3.3.1, 21.4, 21.5, 23.3.3)	☐ Yes	☐ Yes	
56	Vapour return line operational parameters are agreed (11.5, 18.3, 23.7.7)	☐ Yes	☐ Yes	Free flow
57	Measures to avoid back-filling are agreed (12.1.13.7)	☐ Yes	☐ Yes	No-return valves in all liquid lines
58	Status of unused cargo and bunker connections is satisfactory (23.7.1, 23.7.6)	☐ Yes	☐ Yes	
59	Portable very high frequency and ultra high frequency radios are intrinsically safe (4.12.4, 21.1.1)	☐ Yes	☐ Yes	
60	Procedures for receiving nitrogen from terminal to cargo tank are agreed (12.1.14.8)	☐ Yes	☐ Yes	Only for purging

Additional for chemical tankers Checks pre-transfer

Part 5B. Tanker and terminal: bulk liquid chemicals. Checks pre-transfer				
Item	**Check**	**Tanker status**	**Terminal status**	**Remarks**
61	Inhibition certificate received (if required) from manufacturer	☐ Yes	☐ Yes	
62	Appropriate personal protective equipment identified and available (4.8.1)	☐ Yes	☐ Yes	
63	Countermeasures against personal contact with cargo are agreed (1.4)	☐ Yes	☐ Yes	
64	Cargo handling rate and relationship with valve closure times and automatic shutdown systems is agreed (16.8, 21.4, 21.5, 21.6)	☐ Yes	☐ Yes	ESD closing time Ship / Shore: ___sec / 30sec
65	Cargo system gauge operation and alarm set points are confirmed (12.1.6.6.1)	☐ Yes	☐ Yes	

Part 5B. Tanker and terminal: bulk liquid chemicals. Checks pre-transfer (cont.)				
Item	**Check**	**Tanker status**	**Terminal status**	**Remarks**
66	Adequate portable vapour detection instruments are in use (2.4)	☐ Yes	☐ Yes	
67	Information on firefighting media and procedures is exchanged (5, 19)	☐ Yes	☐ Yes	
68	Transfer hoses confirmed suitable for the product being handled (18.2)	☐ Yes	☐ Yes	N/A
69	Confirm cargo handling is only by a permanent installed pipeline system	☐ Yes	☐ Yes	
70	Procedures are in place to receive nitrogen from the terminal for inerting or purging (12.1.14.8)	☐ Yes	☐ Yes	

Additional for gas tankers Checks pre-transfer

Part 5C. Tanker and terminal: liquefied gas. Checks pre-transfer				
Item	**Check**	**Tanker status**	**Terminal status**	**Remarks**
71	Inhibition certificate received (if required) from manufacturer	☐ Yes	☐ Yes	N/A
72	Water spray system is operational (5.3.1, 19.4.3)	☐ Yes	☐ Yes	
73	Appropriate personal protective equipment is identified and available (4.8.1)	☐ Yes	☐ Yes	
74	Remote control valves are operational	☐ Yes	☐ Yes	
75	Cargo pumps and compressors are operational	☐ Yes	☐ Yes	
76	Maximum working pressures are agreed between tanker and terminal (21.4, 21.5, 21.6)	☐ Yes	☐ Yes	Maximum 5 barg for Liquid and 1 barg for Vapour
77	Reliquefaction or boil-off control equipment is operational	☐ Yes	☐ Yes	
78	Gas detection equipment is appropriately set for the cargo (2.4)	☐ Yes	☐ Yes	
79	Cargo system gauge operation and alarm set points are confirmed (12.1.6.6.1)	☐ Yes	☐ Yes	
80	Emergency shutdown systems are tested and operational (18.5)	☐ Yes	☐ Yes	
81	Cargo handling rate and relationship with valve closure times and automatic shutdown systems is agreed (16.8, 21.4, 21.5, 21.6)	☐ Yes	☐ Yes	
82	Maximum/minimum temperatures/pressures of the cargo to be transferred are agreed (21.4, 21.5, 21.6)	☐ Yes	☐ Yes	
83	Cargo tank relief valve settings are confirmed (12.11, 21.2, 21.4)	☐ Yes	☐ Yes	

Part 6. Tanker and terminal: agreements pre-transfer				
Part 5 item	**Agreement**	**Details**	**Tanker initials**	**Terminal initials**
32	Tanker manoeuvring readiness	Notice period (maximum) for full readiness to manoeuvre: Period of disablement (if permitted): N/A		
33	Security protocols	Security level: Local requirements:		
33	Effective tanker/terminal communications	Primary system: UHF ch.6, VHF ch.68 Backup system: Hotline, telephone line		
35	Operational supervision and watchkeeping	Tanker: Terminal: Jetty man, Control man		
37 38	Dedicated smoking areas and naked lights restrictions	Tanker: Terminal:		
45	Maximum wind, current and sea/swell criteria or other environmental factors	Stop cargo transfer:30 Knots Disconnect: 35 Knots Unberth: 40 Knots		
45 46	Limits for cargo, bunkers and ballast handling	Maximum transfer rates: Topping-off rates: Maximum manifold pressure: 5 bar g Cargo temperature: Other limitations:		

Part 6. Tanker and terminal: agreements pre-transfer (cont.)				
Part 5 item	**Agreement**	**Details**	**Tanker initials**	**Terminal initials**
45 46	Pressure surge control	Minimum number of cargo tanks open: Tank switching protocols: Minimum number of cargo tanks open: Tank switching protocols: Full load rate: Topping-off rate: Closing time of automatic valves: — ESD closing time Ship / Shore: sec / 30sec		
46	Cargo transfer management procedures	Action notice periods: 5 min at 25%, 50% and 75% Transfer stop protocols:		
50	Routine for regular checks on cargo transferred are agreed	Routine transferred quantity checks: 1 hour		
51	Emergency signals	Tanker: Terminal: Siren Warning: Long Blast for Fire, 5 on 5 off for Gas, 5 on 10 off for Liquid		
55	Tank venting system	Procedure: N/A		
55	Closed operations	Requirements: Vapor return		
56	Vapour return line	Operational parameters: free flow Maximum flow rate:		
60	Nitrogen supply from terminal	Procedures to receive: Purging Maximum pressure: 5 barg Flow rate: As requested		

Part 6. Tanker and terminal: agreements pre-transfer (cont.)				
Part 5 item ref	**Agreement**	**Details**	**Tanker initials**	**Terminal initials**
83	For gas tanker only: cargo tank relief valve settings	Tank 1: Tank 2: Tank 3: Tank 4: Tank 5: Tank 6: Tank 7: Tank 8: Tank 9: Tank 10:		
XX	Exceptions and additions	Special issues that both parties should be aware of:		

DESFA S.A.

Date and time: _____

Port and berth: Revithoussa LNG Terminal

Tanker: _____

Terminal: Revithoussa

Product to be transferred: LNG

Part 7A. General tanker: checks pre-transfer			
Item	**Check**	**Status**	**Remarks**
84	Portable drip trays are correctly positioned and empty (23.7.5)	☐ Yes	
85	Individual cargo tank inert gas supply valves are secured for cargo plan (12.1.13.4)	☐ Yes	
86	Inert gas system delivering inert gas with oxygen content not more than 5% (11.1.3)	☐ Yes	
87	Cargo tank high level alarms are operational (12.1.6.6.1)	☐ Yes	
88	All cargo, ballast and bunker tanks openings are secured (23.3)	☐ Yes	

Part 7B. Tanker: checks pre-transfer if crude oil washing is planned			
Item	**Check**	**Status**	**Remarks**
89	The completed pre-arrival crude oil washing checklist, as contained in the approved crude oil washing manual, is copied to terminal (12.5.2, 21.2.3)	☐ Yes	N/A
90	Crude oil washing checklists for use before, during and after crude oil washing are in place ready to complete, as contained in the approved crude oil washing manual (12.5.2, 21.6)	☐ Yes	N/A

ISGOTT Checks after pre-transfer conference Ship/ShoreSafety Checklist

For tankers that will perform tank cleaning alongside and/or gas freeing alongside

Part 7C. Tanker: checks prior to tank cleaning and/or gas freeing			
Item	**Check**	**Status**	**Remarks**
91	Permission for tank cleaning operations is confirmed (21.2.3, 21.4, 25.4.3)	☐ Yes	N/A
92	Permission for gas freeing operations is confirmed (12.4.3)	☐ Yes	N/A
93	Tank cleaning procedures are agreed (12.3.2, 21.4, 21.6)	☐ Yes	N/A
94	If cargo tank entry is required, procedures for entry have been agreed with the terminal (10.5)	☐ Yes	N/A
95	Slop reception facilities and requirements are confirmed (12.1, 21.2, 21.4)	☐ Yes	N/A

Declaration

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

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

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

We have also agreed to carry out the repetitive checks noted in parts 8 and 9 of the *ISGOTT* SSSCL, which should occur at intervals of not more than 4 hours for the tanker and not more than 4 hours for the terminal.

If, to our knowledge, the status of any item changes, we will immediately inform the other party.

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

ISGOTT Checks during transfer Ship/Shore Safety Checklist

Repetitive checks

Part 8. Tanker: repetitive checks during and after transfer								
Item ref	Check	Time	Time	Time	Time	Time	Time	Remarks
Interval time:.....4..... hrs								
8	Inert gas system pressure and oxygen recording operational	☐ Yes	☐ Yes	☐ Yes	☐ Yes	☐ Yes	☐ Yes	
9	Inert gas system and all associated equipment are operational	☐ Yes	☐ Yes	☐ Yes	☐ Yes	☐ Yes	☐ Yes	
11	Cargo tank atmospheres are at positive pressure	☐ Yes	☐ Yes	☐ Yes	☐ Yes	☐ Yes	☐ Yes	
18	Mooring arrangement is effective	☐ Yes	☐ Yes	☐ Yes	☐ Yes	☐ Yes	☐ Yes	
19	Access to and from the tanker is safe	☐ Yes	☐ Yes	☐ Yes	☐ Yes	☐ Yes	☐ Yes	
20	Scuppers and savealls are plugged	☐ Yes	☐ Yes	☐ Yes	☐ Yes	☐ Yes	☐ Yes	
23	External openings in superstructures are controlled	☐ Yes	☐ Yes	☐ Yes	☐ Yes	☐ Yes	☐ Yes	
24	Pumproom ventilation is effective	☐ Yes	☐ Yes	☐ Yes	☐ Yes	☐ Yes	☐ Yes	
28	Tanker is ready to move at agreed notice period	☐ Yes	☐ Yes	☐ Yes	☐ Yes	☐ Yes	☐ Yes	
29	Fendering is effective	☐ Yes	☐ Yes	☐ Yes	☐ Yes	☐ Yes	☐ Yes	
33	Communications are effective	☐ Yes	☐ Yes	☐ Yes	☐ Yes	☐ Yes	☐ Yes	
35	Supervision and watchkeeping is adequate	☐ Yes	☐ Yes	☐ Yes	☐ Yes	☐ Yes	☐ Yes	
36	Sufficient personnel are available to deal with an emergency	☐ Yes	☐ Yes	☐ Yes	☐ Yes	☐ Yes	☐ Yes	
37	Smoking restrictions and designated smoking areas are complied with	☐ Yes	☐ Yes	☐ Yes	☐ Yes	☐ Yes	☐ Yes	
38	Naked light restrictions are complied with	☐ Yes	☐ Yes	☐ Yes	☐ Yes	☐ Yes	☐ Yes	

Part 8. Tanker: repetitive checks during and after transfer (cont.)								
39	Control of electrical devices and equipment in hazardous zones is complied with	☐ Yes	☐ Yes	☐ Yes	☐ Yes	☐ Yes	☐ Yes	
40 41 42 51	Emergency response preparedness is satisfactory	☐ Yes	☐ Yes	☐ Yes	☐ Yes	☐ Yes	☐ Yes	
54	Electrical insulation of the tanker/terminal interface is effective	☐ Yes	☐ Yes	☐ Yes	☐ Yes	☐ Yes	☐ Yes	
55	Tank venting system and closed operation procedures are as agreed	☐ Yes	☐ Yes	☐ Yes	☐ Yes	☐ Yes	☐ Yes	
85	Individual cargo tank inert gas valves settings are as agreed	☐ Yes	☐ Yes	☐ Yes	☐ Yes	☐ Yes	☐ Yes	
86	Inert gas delivery maintained at not more than 5% oxygen	☐ Yes	☐ Yes	☐ Yes	☐ Yes	☐ Yes	☐ Yes	
87	Cargo tank high level alarms are operational	☐ Yes	☐ Yes	☐ Yes	☐ Yes	☐ Yes	☐ Yes	
Initials								

Part 9. Terminal: repetitive checks during and after transfer								
Item ref	Check	Time	Time	Time	Time	Time	Time	Remarks
Interval time:.....4 ..... hrs								
18	Mooring arrangement is effective	☐ Yes	☐ Yes	☐ Yes	☐ Yes	☐ Yes	☐ Yes	
19	Access to and from the terminal is safe	☐ Yes	☐ Yes	☐ Yes	☐ Yes	☐ Yes	☐ Yes	
29	Fendering is effective	☐ Yes	☐ Yes	☐ Yes	☐ Yes	☐ Yes	☐ Yes	
32	Spill containment and sumps are secure	☐ Yes	☐ Yes	☐ Yes	☐ Yes	☐ Yes	☐ Yes	
33	Communications are effective	☐ Yes	☐ Yes	☐ Yes	☐ Yes	☐ Yes	☐ Yes	
35	Supervision and watchkeeping is adequate	☐ Yes	☐ Yes	☐ Yes	☐ Yes	☐ Yes	☐ Yes	
36	Sufficient personnel are available to deal with an emergency	☐ Yes	☐ Yes	☐ Yes	☐ Yes	☐ Yes	☐ Yes	
37	Smoking restrictions and designated smoking areas are complied with	☐ Yes	☐ Yes	☐ Yes	☐ Yes	☐ Yes	☐ Yes	
38	Naked light restrictions are complied with	☐ Yes	☐ Yes	☐ Yes	☐ Yes	☐ Yes	☐ Yes	
39	Control of electrical devices and equipment in hazardous zones is complied with	☐ Yes	☐ Yes	☐ Yes	☐ Yes	☐ Yes	☐ Yes	
40 41 47 51	Emergency response preparedness is satisfactory	☐ Yes	☐ Yes	☐ Yes	☐ Yes	☐ Yes	☐ Yes	
54	Electrical insulation of the tanker/terminal interface is effective	☐ Yes	☐ Yes	☐ Yes	☐ Yes	☐ Yes	☐ Yes	
55	Tank venting system and closed operation procedures are as agreed	☐ Yes	☐ Yes	☐ Yes	☐ Yes	☐ Yes	☐ Yes	
Initials								

Appendix 2

SHIP- SHORE PRE-DISCHARGE MEETING / UNLOADING SCHEDULE	
TERMINAL NAME : **REVITHOUSSA**	SHIP NAME
DATE:	TIME:

A	GENERAL				
1	VHF communication Channel 68	Yes	☐	No	☐
2	Terminal provides UHF radio adjusted channel on 2 for primary communications with battery and charger	Yes	☐	No	☐
3	Check of the communication lines				
	hot line	Yes	☐	No	☐
	telephon line (telephone internal lines nu1: 2350, nu2: 2355)	Yes	☐	No	☐
4	Connection of international fire water hose	Yes	☐	No	☐
5	Ship's cargo tanks pressure alongside		☐	mbarg	
6	Terminal's tanks pressure when ship is alongside		☐	mbarg	
8	Max Oper pressure of ship's cargo tanks during discharging		☐	mbarg	
9	Burning gas during discharging	Yes	☐	No	☐
10	Change fuel for ESD test?	Yes	☐	No	☐
11	Open Custody transfer CTM (before ESD)	Yes	☐	No	☐
	* with surveyor or no surveyor	Yes	☐	No	☐
12	Zero trim/list for CTM	Yes	☐	No	☐
13	Warm ESD will be initiated by	Terminal	☐	Ship	☐
B	ARMS CONNECTION PRESSURE_ LEAK TEST_INERTING				
14	Nu of Arms connected	liq./vap.	☐		
15	Nu of Reducers in place / spool pieces removed	liq./vap.	☐		
16	Filter on ship's liq. manifold (60 mesh)	Yes	☐	No	☐
17	Pressure test for liquid/vapour manifold_arms		5barg/1 barg		
18	Leak test for all manifold/arms with Oxygen< 1% by vol	Yes	☐	No	☐
C	VAPOUR COMMUNICATION SHIP/SHORE				
19	Open vapour valve after taking CTM before dicharging			Yes	☐
20	Vapour flow control by	Terminal	☐	Ship	☐
	Terminal lines up vapour line and ship can receive when needed with prior information of the Terminal				
21	max vapour pressure during discharging	Terminal	240	mbarg	
		Ship		mbarg	
	Ship's cargo tanks pressure during discharging should be less than 130mbarg for optimum free flow				

D COOL DOWN

22	Cool down rate of liquid arms under terminal request	50m3/h (~1,5barg)
23	Cool down rate of arms/estimated time of cool down	max 4°C/min | 55 - 60min
	Cool down target temperature on Terminal Side	-130 oC
24	Ship lines already in cool down	Yes ☐ No ☐
25	Ship lines in cool down with internal recirculation	Yes ☐ No ☐
26	Manifold drawing & cool down procedure available	Yes ☐ No ☐
27	Ship lines already drained	Yes ☐ No ☐
28	Total time for cool down	

E CARGO HANDLING

29	Quantity of cargo to be discharged (m3)	
30	Maximum unloading rate (m3/h)	
31	Capacity of each cargo pump (m3/h)	
32	Liquid Line relief valve set pressure	max 19barg
33	Number of cargo tanks/pumps running	
34	Start of each cargo pump as per ramp up schedule	
35	Ramp up schedule, five minutes stand by for each pump to start Five minutes notice before starting each pump	
36	Control of unloading rate by	Terminal ☐ Ship ☐
37	Estimated time of discharging	
38	Ship informs terminal when unloading rate will be stabilized	Yes ☐
39	Ten min notice before 25%, 50%, 75% of total discharged cargo	Yes ☐
40	1 hour notice before ramp down	Yes ☐
41	Five min notice before stopping of each pump after dicharging	Yes ☐
42	Stripping / Heel out requirements	Yes ☐ No ☐
43	Time needed to heel out	
44	Ship confirms that all pumps stopped	Yes ☐

F	BALLAST HANDLING			
45	Ballast handling starts concurently with discharging	Yes ☐	No ☐	
46	Draft on arrival/departure			m
47	Trim range alongside			m
48	Keep zero list	Yes ☐		
G	AFTER DISCHARGING			
49	Estimated time of draining arms/manifold	1,5 Hour		
50	Manifold drawing & drain procedure available	Yes ☐	No ☐	
51	Blowing will stop when methane content < 3% by vol (IR gas meter)	Yes ☐	No ☐	
52	Vapour valve will be closed before final CTM	Yes ☐	No ☐	
53	Estimated time of N2-purge, de-icing of arms	4-5 Hours		
54	Disconnect arms if methane content < 2% by vol. (IR gas meter)	Yes ☐	No ☐	
55	Estimated time for disconnection of the arms	40 min		
56	Ship will return UHF walky talky to terminal shift supervisor	Yes ☐		
57	Gangway will be removed from ship	Yes ☐		
58	Disconnection of international fire water hose	Yes ☐		
59	Disconnection of ESD and Earthing cable	Yes ☐		
H	OTHERS			
60	Visitors on board / check visitor list	Yes ☐	No ☐	
61	Store Requirements (before / after discharging)	Yes ☐	No ☐	
62	Garbages etc. disposal (before / after discharging)	Yes ☐	No ☐	
63	Stand by Tugs name & attendance		VHF ch. 68	

Terminal	Ship Chief Officer

rev. 4, May 2023

Appendix 3

REVITHOUSSA LNG TERMINAL
EMERGENCY PROCEDURE
IN CASE

FIRE ALARM
UNMODULATED - CONTINOUSLY

GAS LEAKAGE ALARM
MODULATED 5 sec ON, 5 sec OFF

LNG LEAKAGE ALARM
MODULATED 5 sec ON, 10 sec OFF

OR ANY INCIDENT ANNOUNCED

LNG Carrier INITIAL ACTION

RAISE	EMERGENCY ALARM ONBOARD
STOP	CARGO OPERATION - ACTIVATE ESD
INFORM	TERMINAL CONTROL ROOM/REPRESENTATIVE
VERIFY	STOPPAGE OF CARGO OPERATION
INITIATE	CARRIER EMERGENCY PLAN
INFORM	PORT AUTHORITY/ CARRIER'S AGENT
INFORM	STAND BY TUG
REQUEST	STAND BY TUG FOR ACTIONS

REVITHOUSSA LNG TERMINAL
EMERGENCY DEPARTURE PROCEDURE

LNG CARRIER'S MASTER AND TERMINAL AGREED EARLY DEPARTURE

LNG CARRIER'S MASTER HAS THE OVERALL CONTROL TO MOVE THE CARRIER FROM BERTH

INFORM LNG CARRIER'S AGENT
INFORM PORT AUTHORITY

AUTHORIZED TO PROCEED WITH MAIN ENGINE _ STAND BY TUG and without LOCAL PILOT

VERIFY GOOD COMMUNICATION with TERMINAL/PORT AUTHORITY/ STAND BY TUG
VERIFY THAT THERE IS SUFFICIENT CREW TO HANDLE THE OPERATION
REQUEST STAND BY TUG TO BE READY FOR ACTIONS

VERIFY THAT TOWING WIRES ARE IN PLACE FOR USE
REQUEST TERMINAL FOR EMERGENCY DISCONNECTION OF ARMS
VERIFY EMERGENCY RELEASE OF ARMS
REQUEST TERMINAL TO BE READY FOR RELEASING LINES
VERIFY STAND BY TUG IS READY TO ASSIST CARRIER
INITIATE PROCEDURE FOR EARLY DEPARTURE
REQUEST PREPARATION OF MAIN ENGINE

VERIFY THAT CARRIER IS READY FOR DEPARTURE

VERIFY THAT TERMINAL IS STAND BY FOR RELEASING LINES

REQUEST TERMINAL RELEASING LINES ONE BY ONE (as per Master Request)

VERIFY RELEASING OF EACH LINE

REQUEST STAND BY TUG FOR ACTIONS

Communications		
UHF ch. 6 and HOT LINE		
In case of failure use either telephone or Marine VHF		
	Phones	**VHF**
Terminal Control Room	2350	VHF ch.68
	2355	
Terminal Representative	**+30 6947877554**	
	+30 6945111118	
Port Authority	**105**	VHF ch. 7
	+30 210-5565520	
	+30 210-5565580	
Stand by Tug		VHF ch. 68