Terminal Technical Characteristics

Contents

DEFINITIONS

Term	Meaning
Adverse Weather Conditions	Conditions which, according to the Maritime Study or according to an order of the responsible person delay or prevent the LNG carrier from mooring/ berthing at the Terminal, as specified below.
Agent	A legal entity registered for maritime agency services performing the maritime agency services in the name and for the benefit of the client concerning the arrival, departure and stay of LNG carriers at the Port, including the required administration of the LNG carrier and its cargo.
Amendment to the Maritime study	Amendment to the Maritime study 'LNG FSRU Krk' prepared by the Faculty of Maritime Studies in Rijeka, 2020, as specified below.
Arrival Window	A period of time assigned to an LNG carrier to arrive at the Pilot Boarding station.
Boil-Off Gas	Gas evaporated from LNG in cargo tanks of the FSRU/LNG carrier.
Cargo	LNG amount to be discharged from the LNG carrier to the Terminal.
Conditions of Use	An agreement which elaborates on responsibilities and connected liabilities of LNG carriers, as specified below.
Estimated Time of Arrival	Estimated time of LNG carrier arrival at the Pilot Boarding Station.
FSRU Vessel	The Floating Storage and Regasification Unit operated by the FSRU O&M provider and owned by Terminal Owner/Operator.
FSRU O&M provider	The legal entity which, under the Operation and Maintenance Agreement concluded with the Terminal Operator, performs the activity of operation and work supervision, and is responsible for the maintenance of the FSRU. Current FSRU O&M provider: *Golar Viking Management d.o.o.*
Harbour Master Office Rijeka	Official representative of the Republic of Croatia in the Rijeka bay region, who controls navigation in the internal and territorial waters of the Republic of Croatia, conducts the inspection of navigation safety and issues documents and approvals for navigation, arrivals and departures.
LNG	Natural gas which has been converted to a liquid state at or below its boiling point (-160 ^{0}C) and at a pressure of approximately 1.01325 bar.
LNG Carrier	LNG carrier/vessel nominated by the Terminal User to unload LNG to the Terminal which shall be in all respects compatible with the Terminal, be in compliance with applicable laws and in relation to which the Operator has the right to perform inspection, surveying and approval pursuant to the Rules of operation of the Liquefied Natural Gas (LNG) Terminal.
LNG Carrier representative	LNG carrier Master or representative that is authorized to conduct activities on behalf of the LNG carrier owner/operator, including the exchange of documentation with Terminal Operator and Port Authority.
LNG Heel	Minimum LNG amount, expressed in m^3, which shall be constantly available at the cargo tanks of the FSRU/LNG carrier.

Notice of readiness	Notice issued by the responsible person of the LNG carrier concerning the readiness of the LNG carrier for cargo transfer operations at the Terminal.
Maritime study	Maritime Study 'LNG FSRU Krk' prepared by the Faculty of Maritime Studies in Rijeka, 2017, as specified below.
Pilot	Officer/Representative who advises the LNG carrier Master on navigation and manoeuvring the LNG carrier to the Terminal, including mooring/berthing and unmooring/unberthing operations at the Terminal.
Port	Special Purpose Port - Industrial port LNG Terminal, Omišalj – Njivice.
Port Authority	Official Representatives of Special Purpose Port - Industrial port LNG Terminal, Omišalj – Njivice.
Port Regulation	Ordinance on order in Special Purpose Port - Industrial port LNG Terminal, Omišalj – Njivice.
Rules of operation of the LNG Terminal	Rules of operation of the LNG Terminal which regulate in a separate manner the description of the Terminal, the development, construction and maintenance of the Terminal, Terminal operation, the contractual relationships and the general conditions of Terminal use, the booking and use of the Terminal capacity, the rules of measuring and the rules of allocation, data publication and data exchange, the indemnification and the rules of selling LNG or natural gas of the Terminal User in an Open Procedure.
Surveyor	An independent expert engaged by the Terminal User and/or LNG Supplier who boards the FSRU/LNG carrier to control and confirm in an independent manner that all the gas measurement and analysis devices and equipment are certified and calibrated, as well as to control and confirm the quantity and quality of the transferred cargo.
Terminal	LNG Terminal located on the Island of Krk, Republic of Croatia. Terminal is owned and operated by Terminal Operator, whereby the FSRU is owned by the Terminal Operator and operated by the FSRU O&M provider.
Terminal User	Gas trader or gas supplier that may be represented by the person authorised to represent the legal person based on a legal transaction, power of attorney or law, and that has concluded a Terminal Use Agreement and the Joint Terminal Use Agreement with the Terminal Operator.
Terminal Owner/ Operator	LNG Hrvatska d.o.o. (LNG Croatia LLC) as the investor and owner of the Terminal or its legal successors, as regulated by the law governing the gas market and the law on LNG Terminal.

ABBREVIATIONS

Abbreviation	Meaning
BOG	Boil-off Gas
CCR	Cargo Control Room
CIMIS	Croatian Integrated Maritime Information System
COU	Conditions of Use
CTMS	Cargo Transfer Measuring System
ERC	Emergency Release Couplings
ESD	Emergency Shut Down
ETA	Estimated Time of Arrival of an LNG carrier at Pilot Boarding Station.
ETD	Estimated Time of Departure of an LNG carrier from Terminal.
FSRU	Floating Storage & Regasification Unit
HP	High Pressure
IMO	International Maritime Organization
ISPS	International Ship and Port Facility Security code
LNG	Liquefied Natural Gas
LNGC	LNG Carrier
MARPOL	International Convention for the Prevention of Pollution from Ships
NG	Natural Gas
NOR	Notice of Readiness
OCDD	Ordinance of certificates, documents and data on maritime traffic and their delivery, collection and exchange, and on the method and conditions of granting approval for free pratique
OCIMF	Oil Companies International Marine Forum
OOW	Officer of the Watch
O&M	Operation and Maintenance
PBS	Pilot Boarding Station
POC	Point of Contact
PPU	Portable Pilot Unit
QRH	Quick Release Hook
ROO	Rules of operation of the Liquefied Natural Gas (LNG) Terminal
SIGTTO	Society of International Gas Tankers and Terminal Operators
SW	Sea Water

1. TECHNICAL CHARACTERISTICS OF THE TERMINAL

LNG Terminal Krk (hereinafter: Terminal) is located on the Island of Krk, Republic of Croatia. The Terminal is owned and operated by LNG Hrvatska d.o.o./ LNG Croatia LLC (hereinafter: Terminal Operator). The Floating Storage & Regasification Unit (hereinafter: FSRU), as a part of the Terminal, is owned by Terminal Operator and operated by FSRU O&M provider. The Terminal is operated in accordance with all relevant international and Republic of Croatia Laws, guidelines and requirements, including the requirements arising from the ROO i.e., Rules of operation of the Liquefied Natural Gas Terminal (Official Gazette 60/18) and all its relevant amendments. The energy activity of managing the Terminal is regulated by the laws and regulations of the Republic of Croatia, which can also be found on web pages of the Terminal Operator (www.lng.hr).

Geographic coordinates of the Terminal are:

- LAT 45°12'02.7"N, LONG 14°31'58.6"E.

The Terminal consists of the following main elements:

- FSRU
- Jetty with auxiliary facilities
- High pressure (hereinafter: HP) connection pipeline

1.1.FSRU

FSRU vessel consists of:

- Liquified Natural Gas (hereinafter: LNG) loading and unloading equipment
- LNG storage tanks and LNG regasification equipment
- Boil-Off Gas (hereinafter: BOG) management equipment
- Natural Gas (hereinafter: NG) send-out and measurement equipment
- Propulsion system, engine room and installations for electricity production
- FSRU Cargo Control Room (hereinafter: CCR)
- Fire protection systems
- Auxiliary systems and facilities

Main technical characteristics of the FSRU can be found in the table 1.1. Additionally, basic requirements of LNG carriers, in terms of cargo (LNG) conditions are provided in table 1.2. below.

Table 1.1. Main technical characteristics of the FSRU

General information	
Length (in m)	280.17
Width (in m)	43
International Maritime Organization (hereinafter: IMO) number	9256767
Size range of LNG carriers and bunker/ feeder vessels that can berth alongside FSRU/on the Terminal (in m^3)	3,500 – 265,000[1]
Regasification system	
Maximum NG send-out rate (in Nm^3/hr) [2]	451,840
Nominal NG send-out rate (in Nm^3/hr)	338,000
Minimum NG send-out rate (in Nm^3/hr)	60,000
Operational pressure of the regasification system (in barg)	70 – 100
Maximum cargo tanks operating pressure (in mbarg)	400
LNG transfer (loading/reloading) system	
LNG Gross storage capacity on the FSRU (in m^3)	140,206
Capacity of storage tanks at normal filling level (98,5%) (in m^3)	138,104
Maximum LNG loading/transfer capacity (in m^3/hr)	8,000
Minimum LNG loading/transfer capacity	TBD (pre-transfer meeting)
LNG reloading capacity (to feeder/bunker vessels) (in m^3/hr)	50 – 1,500
Type of LNG loading/reloading cargo transfer system	Flexible hoses
Number of LNG 'liquid' transfer hoses	4
Number of vapor return flexible hoses	2
FSRU Heel inventory	
Minimum operational LNG Heel inventory (in m^3)	3,200

Table 1.2. LNG carrier cargo conditions requirements

LNG carrier cargo (LNG) conditions requirements[3]	
LNG (cargo) temperature (in °C)	not warmer than minus (-) 159,7
Cargo tanks pressure (in mbarg)	not above 120

1.2.Jetty with auxiliary facilities

The jetty of the Terminal consists of the jetty head, breasting dolphins for FSRU berthing, mooring dolphins for FSRU and LNG carriers mooring, quick release hooks (hereinafter: QRH), the access bridge, the HP discharge arms with connecting pipeline, pig launching station, firefighting system, Terminal control building, and associated facilities.

[1] Depending also on the results of the conducted Compatibility study.

[2] The FSRU vessel will operate with a maximum regasification capacity/send-out rate of up to 338,000 Nm3/hr in accordance with the technical capacity of the NG transmission system of the Republic of Croatia.

[3] Required characteristics of LNG/cargo that will be delivered to the Terminal, further defined in Technical Conditions of the Terminal.

The FSRU vessel, which is moored to the jetty, is connected to the mooring system and to the HP discharge arms through which NG enters the connecting pipeline and further to the NG transmission system. In addition to the mooring of the FSRU, the jetty is also designed for the indirect acceptance of the LNG carriers, which are moored/berthed side by side to the FSRU vessel during cargo transfer operations.

Mooring and berthing system of the Terminal consist of the following main elements:

1. **Jetty head** (visualized as largest segment in the area marked with number 1. on the figure 1.1. below) is located as the main part of the jetty and it is intendent for FSRU berthing. The HP discharge arms with a connection to the NG pipeline are located on the top part of the jetty head.

2. **Three (3) breasting dolphins** designated for FSRU berthing are part of the jetty (indicated in the area marked with number 1. on the figure 1.1. below).

3. **Six (6) mooring dolphins** (indicated in the area marked with number 2. on the figure 1.1. below) which are being used to moor the FSRU vessel and LNG carriers.

4. **Four (4) floating pneumatic fenders** (indicated in the area marked with number 3. on the figure 1.1. below) positioned in the parallel middle body of the FSRU and LNG carrier, and **two (2) 'baby' fenders** (not indicated on figure 1.1. below). By applying the use of mentioned fenders, acceptance of LNG carriers of storage capacity between 3,500m^3 and 265,000m^3 will be possible at the Terminal, depending on the conducted Compatibility study results.

5. **Five (5) fenders** (indicated in the area marked with number 4 on the figure 1.1. below) positioned between the FSRU and onshore part of the Terminal consisting of the jetty head (on which two fenders are located) and three breasting dolphins (one fender on each dolphin).

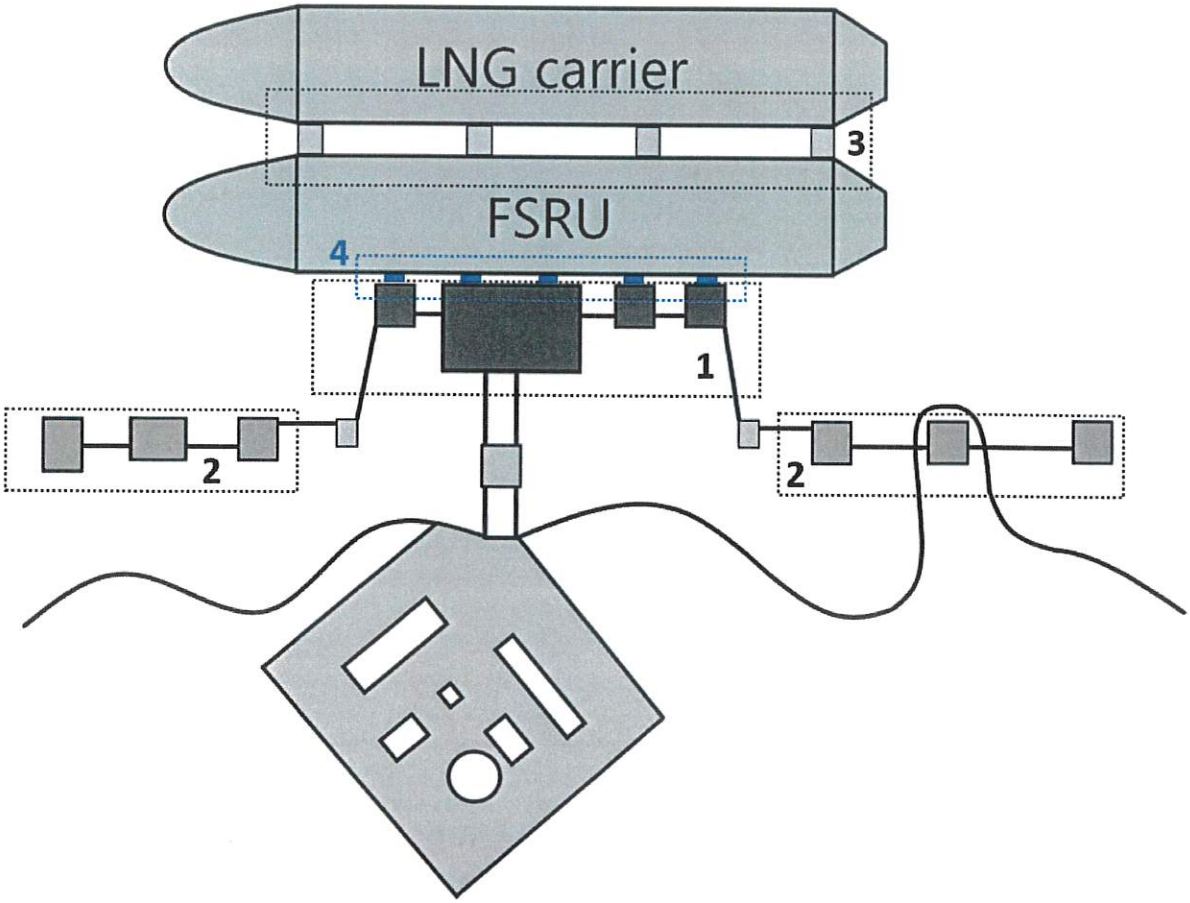

Figure 1.1. Arrangement of mooring/berthing elements of the Terminal

The jetty head, breasting dolphins and mooring dolphins for FSRU and LNG carrier mooring/berthing are connected by catwalks. Catwalks are designed in such way that authorized personnel can access all of Terminal areas. An access bridge, with access pavement and sidewalk, connects the jetty head with onshore part of the jetty. The access bridge has a central concrete structure which provides additional structural support.

The Terminal is equipped with environmental monitoring system which includes monitoring of wind speed and directions, sea water (hereinafter: SW) current and tides, wave height and the system is located on two of the furthest mooring dolphins.

On the onshore part of the jetty, pipeline pig launching station, connecting gas pipeline, water supply system, fire water tank, Terminal control building, and other auxiliary facilities are all located.

1.3.Connecting NG pipeline

The connecting NG pipeline has the following technical characteristics:

- Nominal diameter – DN 1000,
- Maximal operating pressure –100 (bar),
- Length – 4.195,9 (m).

The NG pipeline runs from the jetty head through access bridge to connection point on the onshore part of the Terminal and all the way to the Omišalj gas hub, where Terminal pipeline is connected to the NG transmission system.

At the starting and the end point of the Terminal pipeline, pig launching and receiving stations are installed to perform various maintenance operations.

1.4.Port features

IMO/ISPS number of the Port is: **HROMI-0003**

Port name in CIMIS: **Omišalj – Njivice (LNG)**

Water depth at the area of the jetty is sufficient to accommodate even Qmax vessels, as the depth is above 15,4 m. Depth surveys at the Terminal area, and on the approach channel to the Terminal will be periodically conducted.

2. LNG CARRIER APPROVAL AND REGISTRATION PROCEDURE AT THE TERMINAL

LNG carrier approval and registration procedure at the Terminal alongside with the description of process of overall exchange of documentation between Terminal User and the Terminal Operator is described in the following part of the document. Description below serves as guideline for LNG carriers that intend to moor/berth and conduct cargo transfer operations at the Terminal. It is Terminal User Point of Contact (hereinafter: POC) representative(s) responsibility to obtain all necessary permits and to fulfil all the documentation, as prescribed below.

If the Terminal User fails to obtain all necessary permits and fulfil all the documentation as prescribed below, the Terminal Operator or Port Authority might reject the LNG carrier from berthing at the Terminal.

Majority of documentation and forms mentioned below can be found on web pages of the Terminal Operator (www.lng.hr). Full set of documentation is provided only to registered Terminal Users i.e., nominated LNG carrier arriving at the Terminal. For any operation or procedure, the Terminal User needs to contact the Terminal Operator to verify the required operations and/or procedures.

The overall approval approval/registration procedure needs to be carried out in coordination between LNG carrier Master/Terminal User/authorized person, Terminal/FSRU Operator and Port Authority. To simplify the procedure, any of the following persons can be considered as POC to whom Terminal Operator and Port Authority shall designate all communication regarding approval and registration procedure at the Terminal:

- Terminal User.
- LNG carrier representative/owner/operator/charterer.
- LNG carrier Agent (hereinafter: Agent).
- Any other person having justified interest.

Terminal User needs to designate the POC for any of the approval and registration procedures, as described below. The POC representatives can be multiple, including all of the above-mentioned personnel, as applicable.

The Terminal User is fully responsible and liable to Terminal Operator for any of the responsibilities and actions done by LNG carrier representative/owner/operator/charterer, Agent, and other person having a justified reading/interest, who were designated as POC.

Document exchange procedure between POC and Terminal Operator and Port Authority consists of the two (2) segments:

- **LNG carrier approval procedure**
- **LNG carrier registration procedure**

LNG carrier approval procedure

- **Compatibility documentation exchange**
  - Documentation by which technical compatibility of the LNG carrier with the Terminal is determined, as specified below.
  - Documentation that POC needs to provide to Terminal Operator, as part of the pre-approval package, as specified below.

LNG carrier registration procedure

- **Loading port documentation exchange:**
  - Documentation that needs to be delivered by the POC to the Terminal Operator upon departure from the port of loading, as specified below.
- **Estimated time of Arrival (hereinafter: ETA) exchange:**
  - ETA that needs to be delivered by POC to the Terminal Operator before arrival on Pilot Boarding Station (hereinafter: PBS), as specified below.
- **Notice of readiness (hereinafter: NOR) exchange:**
  - NOR that needs to be delivered by POC to the Terminal Operator after arrival on PBS, as specified below.

Additionally, LNG carrier needs to send departure documentation, which includes:

- **Departure documentation exchange:**
  - Documentation/Information that needs to be delivered by POC before departure from the Terminal, as specified below.

In addition to the approval and registration procedure at the Terminal, LNG carrier navigating in the internal and territorial waters of the Republic of Croatia need to follow procedures and issue documents for registering arrival and departure to the Harbour Master Office Rijeka and Port Authority, as prescribed by Republic of Croatia regulations: *Ordinance of certificates, documents and data on maritime traffic and their delivery, collection and exchange, and on the method and conditions of granting approval for free pratique*, (Official Gazette 70/13, 55/15, 103/17, 13/20), (hereafter: OCDD), and Port Regulation which can be found on web page of the Terminal Operator (www.lng.hr). Such activities need to be coordinated between the Agent, the POC, the Port Authority and Harbour Master Office Rijeka, partially through the Croatian Integrated Maritime Information System (hereinafter: CIMIS).

2.1.LNG Carrier approval procedure

The process of verifying the compatibility of LNG carrier with the Terminal i.e., approval procedure of LNG carrier at the Terminal consists of various interconnected segments. These segments include approval of technical compatibility of the LNG carrier with the Terminal, verification of LNG carrier documentation, alongside with the signature of the Conditions of Use document (hereinafter: CoU).

After LNG carrier was nominated by the Terminal User, the Terminal User needs to specify the POC(s) to whom Terminal Operator shall designate all communication regarding approval procedure at the Terminal.

POC needs to deliver fulfilled form of **Request for Approval**, which can be found on web pages of the Terminal Operator (www.lng.hr). Based on the validity of the request the Terminal Operator will deliver the berth package to the POC. The POC **needs to submit the completed form for the approval of the LNG carrier to Terminal Operator not later than thirty (30) days prior to the arrival window of the LNG carrier at the PBS** or exceptionally outside the specified deadline when the Terminal Operator agrees therewith. Based on the received berth package, the POC should conduct the Compatibility study and deliver the results of the study and all necessary certificates/documentation to the Terminal Operator, as specified below.

The berth package consists of:

- **Berth file** – a basic technical document on which basis POC conducts the Compatibility/Optimoor study.
- **LNG carrier/vessel documentation** – part of the berth package which consists of following elements:
  - *List of necessary documentation/certificates* that POC needs to deliver to the Terminal Operator.
  - *Ship to Ship checklist* which POC needs to deliver to the Terminal Operator.
  - *CoU* that POC needs to deliver to the Terminal Operator signed.

2.1.1. Verification of technical compatibility of the LNG carrier with the Terminal

Technical compatibility of the LNG carrier with the Terminal is checked/verified by the Compatibility/ Optimoor study. The study is performed based on the Berth file which consists of further technical characteristics of the FSRU/Terminal. By conducting the Compatibility study, it is checked/verified if a specific LNG carrier can moor/berth and perform cargo transfer operations on the Terminal in physical, technical and safety aspect. Compatibility study is carried out for each individual LNG carrier planned to arrive to the Terminal.

Result of the Compatibility study will be the proposed LNG carrier to Terminal mooring plan, which needs to be verified by the Terminal Operator and FSRU O&M provider. The Terminal Operator can either accept the proposed mooring plan or reject it. If rejected, the Terminal Operator might propose an alternative mooring plan, if the plan is technical possible. POC must conduct the Compatibility study on its own expense.

2.1.2. Verification of necessary LNG carrier documentation

Alongside with the determination of technical compatibility of the LNG carrier with the Terminal, the POC needs to submit documents mentioned in text below.

2.1.2.1.List of necessary documentation/certificates

In order to verify safety/operational aspects of the LNG carrier the POC needs to deliver various documentation such as: SIRE report, Classification Certificate, Class Status Report, Pictures of the Mooring Areas, etc.

Delivered documentation will serve for verification purposes, as basis of conducting the vetting procedure, which will be done by FSRU representative(s) and Terminal Operator.

2.1.2.2.LNG carrier to Terminal compatibility checklist

In addition to the certificates/documentation delivered, the POC needs to fulfil the LNG carrier to Terminal compatibility checklist.

A part of the LNG carrier to Terminal compatibility checklist needs to be fulfilled with the results from the Compatibility study and therefore it can only be delivered after the Compatibility study was conducted.

2.1.2.3. Conditions of Use

In addition to the delivered documentation stated above, the signed CoU document needs to be delivered to POC. The CoU document prescribes conditions by which all LNG carriers calling at the Terminal must be capable of operating within the physical limitations of the Port Facilities and the Terminal's berth dimensions, cargo transfer hoses envelope and mooring equipment as detailed in the Terminal documentation, or as advised from time to time by Terminal Operator. In addition to the requirements of Applicable Laws, the conditions set in the CoU shall apply to each LNG carrier calling at the Terminal.

The CoU needs to be signed by every Master of the LNG carrier that is planned to berth at the Terminal. If an agreement on the CoU cannot be reached between respected parties and/or the POC does not deliver all necessary and requested documentation from the list above, the LNG carrier can be rejected from the Terminal and may not berth on the Terminal.

2.1.3. Terminal Acceptance Certificate

Following the successful exchange of all necessary documentation and after completion of compatibility verification procedure, which was determined to be acceptable, Terminal responsible person issues for a specific LNG carrier a **Terminal Acceptance Certificate (hereinafter: TAC)**.

The TAC issued by the Terminal responsible person is valid up to two years for each individual LNG carrier, from the certificate issuance date, if there were no modifications related to technical and safety/managerial aspects of the LNG carrier made, after the issuance of the certificate.

The Terminal Operator will publish and update a list of approved LNG carrier arriving at the Terminal on its website.

2.2.LNG carrier registration procedure

After the acceptance certificate was issued for the arriving LNG carrier, and arrival and mooring at the Terminal is allowed, the LNG carrier must conduct the LNG carrier registration procedure.
After LNG carrier was approved by the Terminal Operator, the Terminal User needs to specify the POC to whom Terminal Operator shall designate all communication regarding registration procedure at the Terminal.

Upon departure from the loading port, the POC must send an email to the Terminal Operator containing all relevant information/loading port documentation alongside with completed form of **Request for Registration** as specified in section 3 of this document. The form can be found on the web pages of the Terminal Operator (www.lng.hr).

POC needs to submit to the Terminal Operator a **completed *Request for Registration,* alongside with loading port documentation as specified in section 3 of this document, no later than ten (10) days from the estimated arrival window of the LNG carrier at the PBS**, or exceptionally outside the specified deadline when the Terminal Operator agrees therewith.

Once the loading port documentation is delivered by the POC, the Terminal Operator will deliver to the POC **further set of documentation which needs to be signed on the pre-transfer meeting**, which will be conducted on the LNG carrier, as specified below. Additionally, the Agent needs to be aware of the LNG carrier leaving the loading port, as the **Agent needs to conduct several activities in CIMIS and contact the Port Authority**.

Alongside with the delivery of necessary documentation, the POC/Agent needs to provide **Estimated Time of Arrival** (hereinafter: ETA) of the LNG carrier at the PBS to the Terminal Operator, as specified below.

As part of the pre-arrival package, the POC must send the following information to Terminal Operator:

a) Cargo Manifest
b) Bill of Lading
c) CTMS – Surveyor report
d) Cargo origin certificate
e) Cargo quantity certificate
f) Cargo quality certificate
g) Cargo Safety Data Sheet
h) Time Log/ Port Timesheet
i) Master's receipt of Documents

Cargo manifest, which needs to be delivered as part of pre-approval package must include the following information, as stated in the ROO.

In addition to the documentation stated above the following documentation must be submitted to Terminal Operator **signed** (where applicable) **and no later than three days (72 hours) prior to the arrival window at the at the PBS:**

- **Discharge order** (request by the Terminal User/POC to the Terminal Operator for a specific amount of cargo to be discharged to the Terminal, which is available on the web pages of the Terminal Operator: www.lng.hr)
- **Declaration of Security**
- **Declaration of dangerous or polluting goods**
- **Safety Letter**

By signing the Declaration of Security, Declaration of dangerous or polluting goods and the Safety Letter, the Master of the LNG carrier which will berth alongside the Terminal agrees

with the safety conditions and provision of the Terminal and Port, including the responsibilities and connected liabilities. Documents should be signed by the LNG carrier representative and Port Authority representative before POC sends NOR.

Also, further documentation must be handled between POC and Agent which will through CIMIS fulfil all necessary requirements and forms in accordance with OCDD.

2.2.1. ETA notices

ETA Notice of the LNG carrier needs to be submitted, updated, or confirmed (as the case may be) to the FSRU Master and Terminal Operator, by the POC at the following intervals:

1) **Ninety- six (96)** hours before the then current ETA
2) **Seventy-two (72)** hours before the then current ETA,
3) **Forty-eight (48)** hours before the then current ETA,
4) **Twenty-four (24)** hours before the then current ETA,
5) From the moment when the arrival window of the LNG carrier to the PBS has been estimated to be within 24 hours, the estimated arrival window of the LNG carrier to the PBS shall be updated every six hours.
6) If the cargo to be unloaded has been acquired or diverted to the Terminal, after the departure of the LNG carrier from the load port or after the relevant time specified above, then the ETA Notice shall be submitted as soon as possible after such acquisition or diversion, but in any event taking into account any applicable requirement for the final time by which the arrival of LNG carrier shall notify to the Maritime Authorities.

The ETA notices form is delivered to POC as part of the package during the LNG carrier registration documentation exchange.

In accordance with the Republic of Croatia regulations and EU directives, the Agent must announce arrival of the LNG carrier through the CIMIS at least 72 hours before the LNG carrier arrives at the PBS, or at the latest upon leaving the previous port if the navigation lasts less than 72 hours. The arrival window of the LNG carrier, which is defined as period of time assigned to an LNG carrier to arrive at the PBS, will be defined by the Terminal Operator, based on the LNG regasification capacities for the next gas year request delivered by Terminal Users, as defined in the ROO.

2.2.2. NOR exchange process description

The POC shall tender/send a NOR, to moor/berth and transfer LNG at the Terminal to the FSRU Master and the Terminal Operator as soon as the LNG carrier:

a) has arrived at the PBS,
b) has scheduled Pilotage and Towing services,
c) has cleared the necessary formalities with the Agent/Maritime Authorities in accordance with OCDD and all other relevant Competent Authorities,
d) is ready in all respects, including having prepared the Spool Pieces to proceed to moor at the Terminal and commence cargo transfer operations.

The NOR must at least include the following:

- Statement that the LNG carrier is ready in all aspects to perform safe operation at the Terminal.
- Snapshot of the CTMS, as evidence of cargo (LNG) temperature and pressure levels.

The Terminal/Port Operator, Harbour Master Office Rijeka, Pilots and Agent will coordinate Terminal berthing instructions, according to ETA.

2.3.Pre-transfer meeting documentation exchange process description

After all formal procedures are completed and Terminal Operator accepts the NOR, LNG carrier is approved to enter into the Port and berth at the Terminal. After berthing operation is completed, and before the start of cargo transfer operations, a "pre-transfer meeting" is to be held on-board the LNG carrier.

The purpose of the pre-transfer meeting is to ensure that all aspects of cargo transfer operations are clearly understood and documented by signing relevant forms.

The following forms, which were delivered to POC as part of the loading port documentation, are completed, and signed during the pre-transfer meeting:

- **Safety checklists**
- **Cargo handling agreement**
- **Communication agreement**
- **Port and Ship Security Interface Form**

After all relevant documents are signed, and Terminal/FSRU representatives makes the safety round on the LNG carrier, the LNG carrier is fully accepted by the Terminal Operator/ FSRU Master/ Port Authority and my commence with cargo transfer operations.

2.4.Departure documentation exchange process description

After cargo transfer operation is competed and LNG carrier is ready for un-berthing procedure, in accordance with the regulation of Republic of Croatia and EU directives, Agent must announce departure of the LNG carrier through the CIMIS following procedures and requirements from OCDD, which must be completed and accurately fulfilled at least 1 hour before Estimated Time of Departure (hereinafter: ETD).

Based on completed and fulfilled announcement, Harbour Master Office Rijeka, through CIMIS issues "Permit for Departure", once all pre-conditions are met.

The Terminal/Port Operator, Harbour Master Office, Pilots and Agent will coordinate un-berthing instructions and departure of LNG carrier from the Terminal, according to ETD.

Table 2.1. below provides further information on the overall LNG carrier compatibility, approval procedure and documentation that needs to be exchanged.

Table 2.1. Basic overview of the document exchange procedure:

Step	Description
1	**Compatibility documentation exchange**
1.1	LNG carrier that is intended to berth at the Terminal is nominated by the Terminal User. Terminal User dedicated the POC representative(s) which sends fulfilled form of ***Request for Approval*** to the Terminal Operator.
1.2	Based on the request the Terminal Operator delivers the ***Berth package*** consisting of: ***1. Berth file*** ***2. List of necessary documentation/certificates*** ***3. LNG carrier to Terminal compatibility checklist*** ***4. CiU***
1.3	Based on the Berth file the POC conducts the Compatibility study.
1.4	Additionally, POC needs to deliver documents/certificates, and the full list of documentation is specified below. Also, POC should deliver the fulfilled LNG carrier to Terminal compatibility checklist. Part of the checklist needs to be fulfilled with the results of the Compatibility study.
1.5	Full set of documentation (result of the Compatibility study, documentation/ certificates, and the fulfilled checklist, i.e., documentation mentioned in step 1.2 of this table) is reviewed by the Terminal Operator. Based on the information/documentation provided, the FSRU O&M provider/Terminal Operator conducts the vetting/approval procedure.

1.6	Based on the information provided, the Terminal Operator can either accept the proposed mooring plan or reject it. If rejected, the Terminal Operator might propose an alternative mooring plan.	Additionally, in parallel to the documentation exchange between the POC and Terminal Operator, the Terminal CoU document is shared to be signed by all relevant parties, as part of necessary documentation/ certificates.
1.7	If the mooring plan is technically not possible, the LNG carrier can be rejected from the Terminal and may not berth on the Terminal.	If an agreement on the CoU cannot be reached between respected parties and/or the POC does not deliver all necessary and requested documentation, the LNG carrier can be rejected from the Terminal.
1.8	Following the successful exchange of all necessary data and after completion of Compatibility study, which is determined to be acceptable, Terminal responsible person issues a ***TAC*** by which the LNG carrier is approved.	
2.	**Loading port documentation**	
2.1	Upon departure from the loading port, the POC must send an email to the Terminal Operator representative containing all necessary ***Loading port documentation***, including the ***Request for Registration***.	
2.2	Additionally, the Agent needs to be aware of the LNG carrier leaving the loading port, as the Agent needs to conduct several activities in CIMIS, as specified below.	
2.3	Alongside with the delivery of necessary documentation the POC /Agent needs to provide ***Estimated Time of Arrival notification*** of the LNG carrier to the Terminal Operator, as specified below.	
3	**Discharge Order**	
3.1	**Discharge order**, which request by the Terminal User/POC to the Terminal Operator for a specific amount of cargo to be discharged to the Terminal needs to be delivered no later than three days (72 hours) prior to the arrival window at the at the PBS.	
4	**NOR**	
4.1	Upon arrival at the PBS all formal procedures are performed by POC /Agent together with Terminal/Port/Croatian Authorities (customs, etc.).	
4.2	After all formal procedures mentioned in point above are finalized POC tenders the ***NOR*** to Terminal Operator, by which readiness of the LNG carrier to berth at the Terminal and condition of cargo is confirmed.	
4.3	Upon acceptance of the NOR by the Terminal Operator/FSRU O&M provider/Port Authority, the LNG carrier may enter into the Port and berth on the Terminal.	
4.4	The Terminal/Port Operator, Harbour Master Office Rijeka, Pilots and Agent will coordinate berthing instructions at the Terminal, according to ETA.	
5	**Pre-transfer meeting**	

5.1	After berthing operation is completed, and before the start of cargo transfer operations, a "pre-transfer meeting" is to be held on-board the LNG carrier. Authorized personnel are transported from the FSRU to the LNG carrier. A set of ***Pre-transfer documents*** is signed between respective parties.
5.2	Once all documents are signed, cargo transfer operation may start.
6	**LNG carrier departure**
6.1	After cargo transfer operation is competed, in accordance with the regulation of Republic of Croatia and EU directives, **Agent must contact the Port Authority and announce departure of the LNG carrier through the CIMIS** which must be completed and accurately fulfilled at least 1 hour before ETD.
6.2	The Terminal/Port Operator, Harbour Master Office Rijeka, Pilots and Agent will coordinate un-berthing and departure of LNG carrier from the Terminal, according to ETD.

3. TERMINAL COMMUNICATION

Communication between the Terminal/Port Authority/FSRU and LNG carriers shall be in English language. Prior berthing and when un-berthing process started, communication between Terminal/Port Authority/FSRU/Pilots/Tugboats and LNG carrier's is established through VHF channels. When LNG carrier is berthed, UHF portable radio stations will be provided to LNG carriers by FSRU Operator on the pre-transfer meeting and primary communication between Terminal/Port Authority/FSRU and LNG carrier's is established through UHF channel. UHF portable radio stations will be collected back on the post-cargo transfer meeting.

Additionally, the communication between berthed LNG carrier and FSRU vessel is achieved by using 'Hot line' i.e., Ship-to-Ship link. The ship-to-ship link is tested prior any of the operations done at the Terminal and the Ship-to-Ship link remains connected through all the cargo transfer procedure, until cargo transfer hoses are disconnected.

Also, in addition to above-mentioned means of communication, alternative communication when LNG carrier is berthed can be achieved via VHF channels, if needed.

The Communication Agreement must be completed and signed during the pre-transfer meeting. The Communication agreement defines procedures to be implemented between the Terminal/Port Authority/FSRU and the LNG carrier.

The communication matrix, including all relevant information on proper UHF/VHF channels to be used, alongside with telephone numbers and e-mail addresses of Terminal/FSRU responsible persons is provided to POC.

For any operation or procedure regarding communication, the POC to contact the Terminal Operator to verify the required procedures.

4. LNG CARRIER BERTHING PROCEDURE

Berthing and un-berthing maneuver of LNG carrier during first six months of Terminal operation, is permitted only during daylight hours, as defined in Port regulation, which can be found on web pages of the Terminal Operator (www.lng.hr).

Additionally, as described in item 4.4., until completing the dredging of shallow areas, the acceptance of the LNG carrier may be performed only during daylight, by approaching from South West, with previous turning and portside berthing i.e., only by using the below mentioned third way of approaching to the Terminal.

After that period, if it can be concluded, based on the collected experiences, that both the berthing and un-berthing maneuver are equally safe, the Harbour Master Office Rijeka can approve the mooring and unmooring of the LNG carrier during the entire day.

All of the requirement related to Maritime requirements are stated in the Maritime study 'LNG FSRU Krk', approved by Ministry of the Sea, Transport and Infrastructure, Maritime Safety Directorate, Harbour Master Office Rijeka, CLASS: UP/I-350-05/18-01/31, Registry Number: 530-04-4-2-2-18-2 ("Maritime study") and Amendment to the Maritime study approved by Ministry of the Sea, Transport and Infrastructure, Maritime Safety Directorate, Harbour Master Office Rijeka, CLASS: UP/I-350-05/18-01/31, Registry Number: 530-04-5-2-220-40.

A safety zone is established around Special Purpose Port - Industrial port LNG Terminal, Omišalj - Njivice in diameter at least 500 meters from any of the end points of the FSRU vessel or visiting LNG carrier.

4.1.Pilotage requirements at the Port/Terminal

Pilotage is compulsory when the LNG carrier is going to berth at the Terminal/ to un-berth from the Terminal. The POC and Agents must schedule Pilotage service no later than 48 hours before the LNG carrier arrives in the Rijeka bay and Pilot should be onboard of LNG carrier before NOR is sent/tendered. The POC and Agents must schedule Pilotage service no later than 2 hours before the LNG carrier is planning to un-berth from the Terminal and Pilot should be onboard of LNG carrier latest 15 minutes before starting the un-mooring procedure.

All berthing, mooring, and unmooring operations within the safety zone of the Terminal must be done with approved Pilot(s) on-board, except in emergency situations. The Master of the LNG carrier always remains in command of the LNG carrier and is responsible for safe navigation and operation whenever a Pilot is on-board.

Terminal/FSRU has the right to send a mooring master on-board the LNG carrier to assist the Pilot(s) and monitor maneuvers, if needed. The Terminal/FSRU representative is not responsible for the availability, provision or performance of Pilot(s).

The Pilotage service is initiated by a call on predetermined VHF channel. Pilot arrives to the LNG carrier with the help of a pilot boat. The LNG carrier is obligated to provide lee for the pilot boat when the Pilot is coming on board and provide to the Pilot a safe boarding to the ship with the help of pilot ladders, ship ladders, or a combination of pilot and accommodation ladders.

Usage of two Pilots is required during the first year of operation i.e., throughout year 2021, while if experience reveals that one Pilot is enough, the obligation to use two Pilots can be changed after gaining enough experience.

Pilots will be equipped with Portable Pilot Unit (hereinafter: PPU) to measure approaching LNG carrier distance and speed to Terminal.

The pilot boarding station is positioned on the following coordinates: **LAT 44° 56,2" N, LONG 14° 13,0" E.**

4.2.Towing requirements at the Port/Terminal

Tugboats support of LNG carriers arriving and departing from the Port/Terminal is mandatory. The POC and Agents must schedule Towing service before LNG carrier sending the NOR, as specified above.

Also, it is mandatory to have tugboats support available during cargo transfer operations at the Terminal. Towing service needs to be coordinated between POC and the Agent, as the Terminal is not in charge for provision of tugboats.

In line with the Maritime study, regulations, guidelines, and standards of the LNG industry, the following should be used when approaching/berthed at the/departing form the Terminal:

- **4 or more tugboats**, each with bollard force of at least 500 kN (50 t bollard force) **during the berthing manoeuvre** at the Terminal.
- **2 or more tugboats**, each with bollard force of at least 500 kN (50 t bollard force) **during the departing manoeuvre** from the Terminal.

- During the cargo transfer operations **1 or more tugboats** with bollard force of at least 500 kN (50 t bollard force) capable for firefighting support needs to be **continuously on stand-by,** in case of LNG carrier early departure or emergency situations.

In case an LNG carrier which is going to berth at the Terminal is larger in capacity/size than the FSRU 'LNG Croatia', and for which during the Compatibility/Optimoor study it was concluded that additional mooring lines need to be placed on mooring dolphins (MD) 1 and 6 of the Terminal, the LNG carrier needs to coordinate placement/un-placement of such lines with the Agent. **Terminal is not responsible for providing such mooring/unmooring services and LNG carrier representative needs to organize such activity with the Agent by themselves.** Transport of lines from LNG carrier to Terminal mooring elements (MD 1 and MD 6) is performed by using a small self-propelled boat/vessel which needs to be verified by Port Authority. Evidence of contracting such services and vessel(s) needs to be delivered to Port Authority 72 hours before arrival to the PBS.

4.3.Anchorage information

Anchorage for vessels transporting liquefied gas in a circular shape of an approximately 3 miles (M) diameter with the center at **LAT 45° 11,1' N, LONG 14° 28.3' E.** The position of the anchorage is located at approximately 1,5 M from the shores of the Island of Krk close to Njivice.

Further information about pilotage, towing and anchorages can also be found in the Maritime study.

4.4.Berthing procedure description

Objective of the mooring of the LNG carrier alongside the FSRU/Terminal is the following:

- LNG carrier successfully moored alongside the FSRU vessel/Terminal.
- Bow-to-bow, stern-to-stern, and manifolds/vapour lines of the FSRU and LNG carrier are aligned.

As per maritime regulations tugboats will be used to:

- Align LNG carrier heading with FSRU vessel heading.
- Control lateral position of the LNG carrier.
- Push / pull LNG carrier towards FSRU vessel whilst keeping a parallel alignment.

According to the conclusion arising from the Amendment to the Maritime study, following approach manoeuvre to the Terminal/Port is to be used until shallow areas in front of the Terminal are dredged. Pilots will, in agreement with LNG carrier Master, determine the optimal approach to the Terminal.

In line with conclusions form the Maritime study, for safe manoeuvring from any direction and the accommodation of the largest LNG carriers, the shallow spots (13.7 m) in front of the Terminal were planned to be dredged to the depth of at least of 15 m (Figure 5.1.).

Due to unforeseen circumstances, dredging of the shallow spots was not completed before start of commercial operations at the Terminal. Therefore, LNG carriers arriving to the Terminal are not able to approach by using above-mentioned manoeuvres (first or second approach manoeuvre).
Accordingly with the current situation, Amendment to the Maritime study 'LNG FSRU Krk' was prepared by the Faculty of Maritime Studies in Rijeka, 2020, and approved by Ministry of the Sea, Transport and Infrastructure, Maritime Safety Directorate, Harbour Master (hereinafter: Amendment to the Maritime study), which can be found on web pages of the Terminal Operator (www.lng.hr).

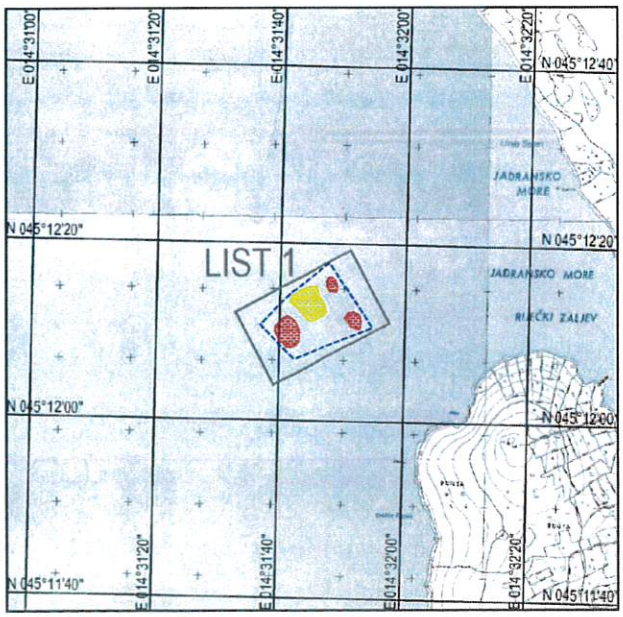

Figure 5.1. Location of shallow spots (red) and the area of placing the dredged material (yellow)

In order to enable arrival of the LNG carriers to the Terminal until shallow spots are dredged, a new (Third) approach manoeuvre (Figure 5.2.) was set as an obligatory approach manoeuvre:

- Third approach manoeuvre, i.e., the approach of the LNG carrier to the FSRU by sailing from SW, presupposes navigation of an LNG carrier from the direction of Vela Vrata strait towards the area S of the Terminal (approximately 10 NM, bearing 95°).

- Tugboats are tied approximately 2 NM form the location of the Terminal. LNG carrier is stopped (at the distance approximately 0.3 – 0.5 NM from FSRU manifold) and rotated by tugboats to the direction parallel to the FSRU (the course being approximately 224°).

- LNG carrier is towed by the tugboats, bearing of approximately 44°, until parallel to the FSRU. Upon stopping the LNG carrier parallel to the FSRU, the tugboats change the position and begin pushing towards the FSRU. Once the LNG carrier is sufficiently near the FSRU, mooring lines are placed, usually the springs first, and then the breast lines, forward lines and stern lines.

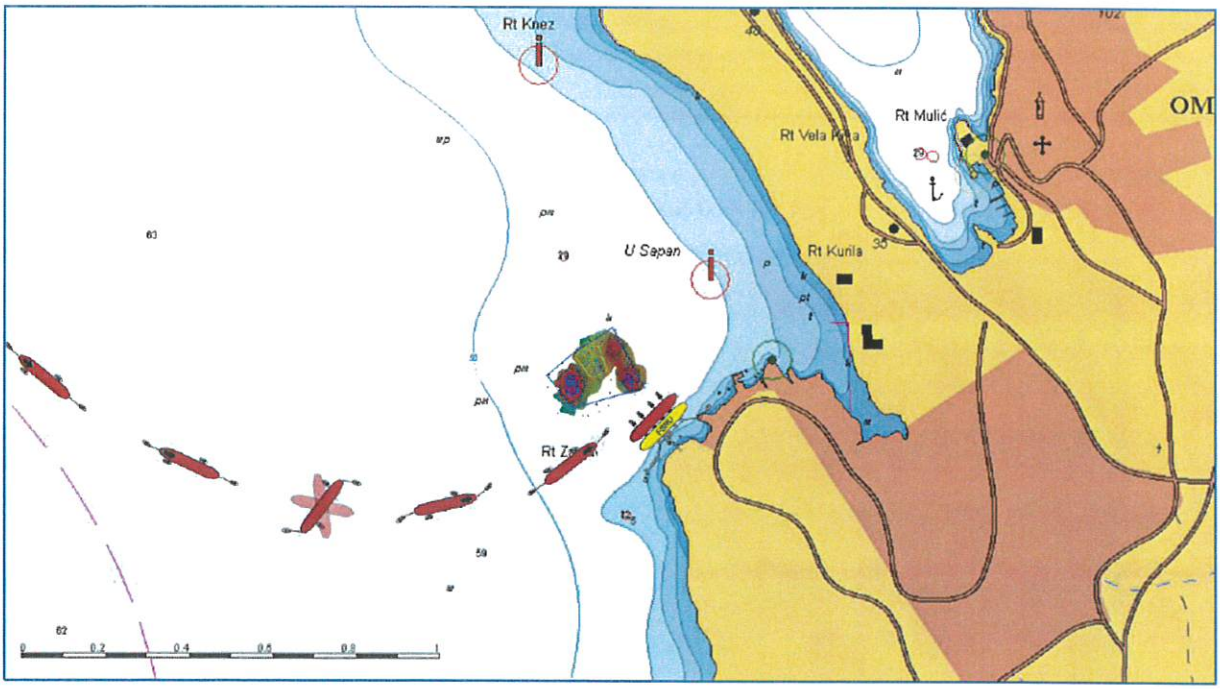

Figure 5.2. Third approach manoeuvre

For clarification purposes, figures 5.3. and 5.4. are provided in the following text.

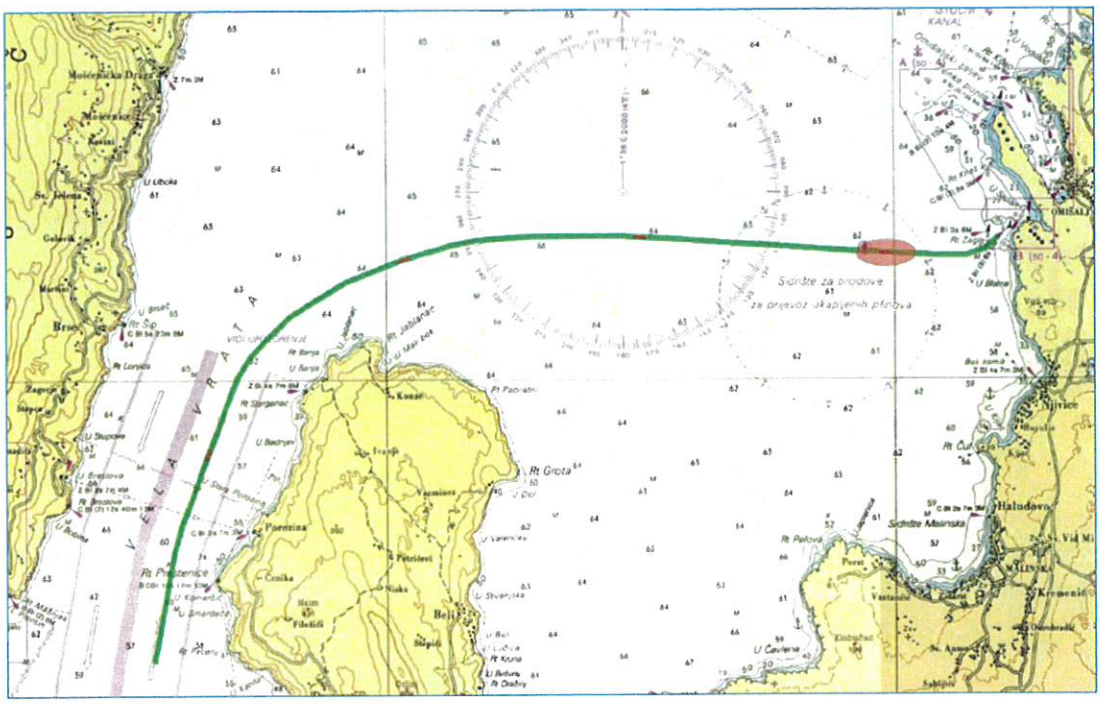

Figure 5.3. Sailing of LNG carrier from the passage of Vela Vrata until the FSRU, with the marked area where tugs are tied up (red)

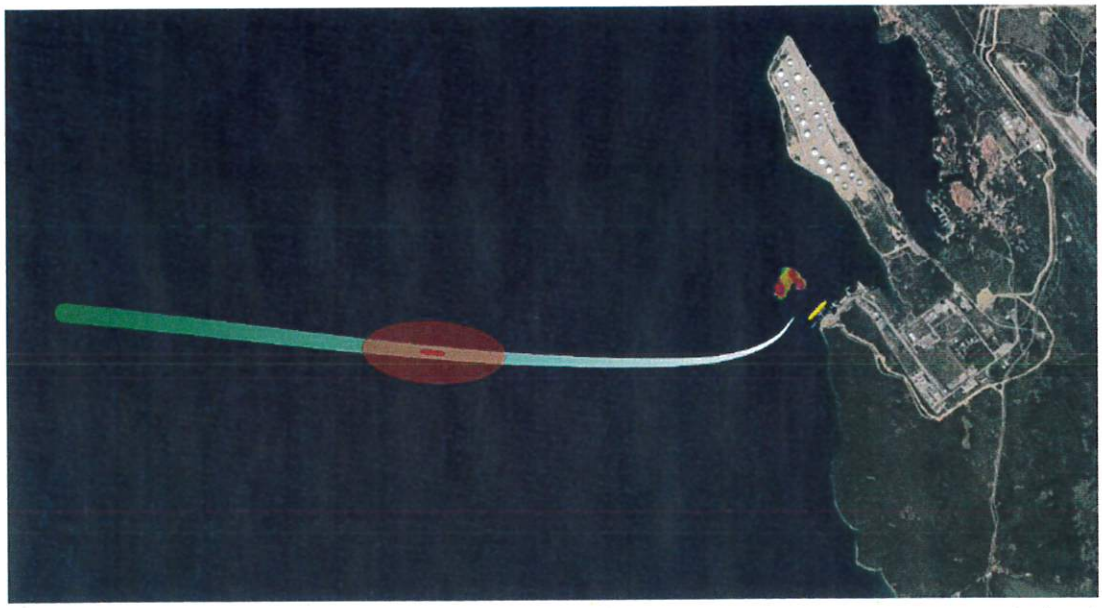

Figure 5.4. Direct approach of an LNG carrier to the FSRU, with the marked area where tugs are tied up (red)

Until completing the dredging of shallow areas, the acceptance of the LNG carrier may be performed only during daylight, by approaching from SW, with previous turning and portside berthing i.e., only by using the abovementioned third way of approaching to the Terminal.

4.5.Adverse weather conditions

Adverse weather conditions are conditions which, according to the Maritime Study or according to an order of the Port Authority or at the order of the Harbor Master Office Rijeka, delay or prevent the LNG carrier from mooring/berthing at the Terminal or on the basis of which the Master and/or representative of the LNG carrier/FSRU estimate that it is not safe to moor/berth the LNG carrier at the Terminal or on the basis of which the Master and/or representative of the FSRU estimate that it is not safe to moor/berth the LNG carrier at the Terminal.

Prior LNG carrier calling the Port/Terminal and during LNG carrier stay at Terminal LNG carrier's Master and FSRU's vessel Master, as well as Port and Terminal responsible personnel, have to receive and monitor weather reports from Republic of Croatia Hydro-Meteorological Institute (DHMZ) minimum twice a day

In addition to monitoring weather reports from DHMZ, the Terminal is equipped with environmental monitoring system which includes monitoring of wind speed and directions, SW current and tides and wave height. **Reports from Terminal environmental monitoring system are considered to be the relevant and should be used as weather reference for decision made by both LNG carrier and FSRU representative(s).**

Specific information on procedures to be performed on the Terminal, in terms of prevailing weather conditions, is provided in Technical Conditions of the Terminal and Port Regulation.

5. CARGO TRANSFER OPERATIONS

The LNG carrier is to be ready for transfer of cargo to the FSRU vessel as soon as possible, after berthing operation was completed.

As specified above, before the start of cargo transfer operations, a "pre-transfer meeting" is to be held on-board the LNG carrier. The purpose of the pre-transfer meeting is to ensure that all aspects of cargo transfer operations are clearly understood and documented by signing relevant forms. Additionally, Terminal representative(s) will have the right to inspect the LNG carrier prior start of cargo transfer operations to determine functionality of the LNG carrier.

The FSRU vessel Master will decide the commencement, continuation, or closure of cargo transfer operations according to the prevailing and forecasted environmental conditions and situation on the FSRU/Terminal.

The LNG carrier's Master is to be fully consulted during any of the actions made by the FSRU Master. The LNG carrier Master can also stop the cargo transfer operation for safety reasons as well, if he determines that LNG carrier might be endangered. The procedures for the intended cargo handling must be agreed in writing during the pre-transfer meeting.

Cargo (LNG) transfer is normally conducted through four (4) liquid cargo transfer hoses, while the vapour is returned to LNG carrier by two (2) hoses, unless otherwise agreed at the pre-transfer meeting. The CTMS system which is located on the LNG carrier must be in compliance with international LNG industry standards, guidelines, recommendations and best practice

Evidence on compliance of the CTMS with the above-mentioned requirements needs to be provided to FSRU Master/Terminal representatives as part of pre-arrival package. The certified CTMS fitted on the FSRU will only be used for FSRU internal inventory management and to verify the quantities of LNG transferred from the LNG carrier to the FSRU.

FSRU/Terminal Representative(s) and Independent Cargo Surveyors can witness LNG measurement activities during the whole cargo transfer procedure, while the Terminal User representative may also be present on the Terminal, upon approval from the Terminal side.

Before cargo transfer operations start the ESD procedures are agreed during pre-transfer meeting between FSRU and LNG carrier. The ESD procedures include warm and cold ESD test and they are to be conducted by the Terminal/LNG carrier/FSRU representatives, where applicable. Once the Cold ESD test is successfully performed, transfer of the LNG from the LNG carrier to the FSRU may commence.

A post-cargo transfer meeting will be held on the LNG carrier after the cargo transfer procedure is conducted.

The FSRU, Terminal Representative(s) and Port representative(s) and the designated responsible person(s) appointed by the LNG carrier's Master for cargo handling operations on board the LNG carrier must attend this meeting. The purpose of the post-cargo transfer meeting is to:

- confirm quantity and quality of the cargo which was transferred from the LNG carrier to the FSRU vessel,
- discuss any observations made during the operation,
- discuss on any lessons learned during the operation that can be used to improve future operations, and
- complete evaluation forms and other necessary documentation.

6. SERVICES AT THE TERMINAL

The local requirements of the LNG carrier are to be arranged by the Agent. The FSRU Master/ Representative may assist in these arrangements if requested, and if able to do so.

Provision, stores, and crew changes	There are no facilities for provisions of storing or crew changes at the Terminal. The LNG carrier's Master and Agents must schedule crew changes or stores deliveries prior to berthing, after un-berthing, or while at anchor. While the LNG carrier is berthed alongside the Terminal, support vessels may not approach the LNG carrier and stores and/or spares may not be loaded or unloaded.
Repairs & hull cleaning	Repair and hull cleaning activities at the Terminal and/or within Port/Terminal safety zone are not permitted.
Medical care	Emergency medical evacuation to shore may be organized by the Agent at the expense of the LNG carrier. If the Agent or LNG carrier's representative requests medical evacuation, the Agent is responsible for logistical arrangements for the evacuees upon arrival on shore.
Bunkers and portable water	There are no bunkering or potable water facilities at the Terminal, fuel supply of LNG carriers is not permitted at the Terminal or within the Port/Terminal Exclusion Zone. The POC and Agent(s) must schedule fuel bunkering or water supply prior to berthing, after un-berthing, or while at anchor and the Agent is responsible for logistical arrangements for fuel or water supply.
Garbage/ sewage facilities at the Terminal	According to Croatian maritime laws/Regulations, the POC and Agent must schedule garbage/sewage handling to be provided from the starboard side of LNGC in accordance with the Port plan for handling of waste prior to arriving at the Terminal. Port plan for handling of waste can be found at Terminal Operator web pages: (www.lng.hr)
Towing service	The POC and Agent(s) must schedule Towing service before sending the NOR. The Terminal is not in charge for provision of tugboats.
Pilotage service	The POC and Agent must schedule Pilotage service 48 hours before the LNG carrier arrives in Rijeka bay. Pilot(s) should be onboard LNG carrier before sending the NOR. The POC and Agent(s) must schedule Pilotage service no later than 2 hours before the LNG carrier un-berths from the Terminal. Pilot(s) should be onboard of LNG carrier 15 minutes before starting the un-mooring procedure. The Terminal is not in charge for provision of Pilotage service.

The availability of other services shall be verified directly with the Agent, as required by procedures and authorizations from Croatian Authorities, Port Authorities and Terminal.

7. EMERGENCY PROCEDURES

The safety requirements at the Terminal are, among other guidelines and regulations, based on Oil Companies International Marine Forum (hereinafter: OCIMF), Society of International Gas Tankers and Terminal Operators (hereinafter: SIGTTO) and other LNG industry accepted standards. The LNG carrier's personnel are responsible for the safety of the LNG carrier. The LNG carrier's Master and crew must take all necessary safety precautions for the handling with hazards of LNG loading, unexpected weather conditions and other relevant circumstances.

Extraordinary circumstances are all circumstances which can endanger the environment, the FSRU, LNG carrier, vessels in the vicinity of the Terminal and Terminal facilities. In case of work accidents, usual procedures set forth by work protection system on LNG terminals prescribed by ISM system of FSRU vessel and LNG carrier, shall be applied.

To ensure quick and safe disconnection of the LNG carrier from the FSRU, the FSRU is equipped with:

- Emergency Release Couplings (hereinafter: ERC) on the cargo transfer hoses connection.
- Remote QRH system.

Additional, to ensure quick and safe disconnection of the LNG carrier and/or the FSRU from the jetty, the jetty system is equipped with:

- ERC on the HP discharge arms connection.
- Remote QRH system.

Both systems can be operated from the CCR of the FSRU vessel in an event of an emergency which can place any of the vessels in extreme risk. Tugboats are on permanent standby during cargo transfer operations, as per maritime and Terminal requirements.

Boilers, main engines, steering machinery and other equipment essential for maneuvering of the LNG carrier must be kept in state of readiness whilst the LNG carrier is berthed at the Terminal, so the LNG carrier can un-berth from the Terminal under her own engine power at short notice, in case of emergency. However, tugboats should be also available to assist the LNG carrier in such emergency situations, as defined above. Response to specific emergencies will be agreed during the pre-transfer meeting.

8. ENVIRONMENTAL PROTECTION

All vessels operating in the waters of the Republic of Croatia, including the waters of the Terminal/ Port must follow all applicable Croatian Laws and Regulations, EU laws and International Conventions to prevent pollution, ballast water management, residues management and emissions.
The Master of the LNG carrier may contact the Terminal Administration and the Agent if there are doubts regarding these regulations in the Port and Terminal area.

All LNG carrier transferring LNG at the Terminal must be in compliance with the applicable International Convention for the Prevention of Pollution from Ships (hereinafter: MARPOL) requirements and other applicable environmental regulations. LNG carriers are warned that pollution of any kind and irrespective of the quantity is viewed as extremely serious act and must be reported immediately to Port Authorities/Terminal Operator.

Cargo transfer hoses connections are leak tested by the FSRU crew with nitrogen before cargo transfer operation starts and LNG carrier crew needs to maintain a lookout to detect and prevent leaks during cargo transfer operations. The leak test pressure is agreed between the LNG carrier representative and FSRU vessel representative and is dependent on the planned maximum operating pressure.

All unused LNG carrier cargo and bunker connections must remain closed and blanked during the stay of the LNG carrier at the Terminal. The internal transfer of LNG carrier bunkers is not permitted whilst berthed alongside the FSRU vessel.

Venting of cargo vapor to the atmosphere is not permitted in the safety area of the Terminal. If such serious incident occurs, the LNG carrier Master must report all incidents referring to cargo (LNG) vapor venting to the FSRU/ Terminal Operator immediately after such incident has occurred and take action to prevent further accidental venting of the cargo in the atmosphere.

Due to highly sensitive gas detection system installed on the FSRU vessel, it is important that even small gas leaks are reported immediately to the FSRU and Terminal representative to prevent ESD action from activation during cargo transfer operation.

In case of an emergency, if venting occurs on the LNG carrier, cargo transfer operations must be stopped immediately, and FSRU vessel Master and Terminal/Port must be notified immediately.

The discharge of bilge and sewage effluents, oil, or any mixture containing oil to the sea is not permitted. Bilge overboard valves must be visibly locked and sealed shut. The list of locked sealed valves is to be provided to the FSRU Master/Terminal Operator.

During the voyage from the PBS to the Terminal, stay at the Terminal and while inside the safety zone of the Terminal it is prohibited to use hypochlorite device(s). Additionally, ballast overflow is not permitted for LNG carriers during voyage from the PBS to the Terminal, while located inside the safety zone or moored at the Terminal.

While located inside the safety zone or moored at the Terminal, LNG carrier must ensure air emissions are in compliance with all applicable laws and regulations. Excessive smoke emissions from the LNG carrier's funnel and soot blowing are not permitted in the Exclusion/Restricted areas of the Terminal. Gas Combustion Unit (hereinafter: GCU) usage is only permitted for safety/operation reasons, with approval from the Terminal, which is agreed during the pre-transfer meeting.

Safety limit of cargo pressure in both LNG carrier and FSRU vessel is agreed during the pre-transfer meeting. Where LNG carrier has different mean of handling BOG, i.e., reliquefication plant can be used, if agreed on the pre-transfer meeting.

If the pollution prevention rules are not followed the LNG carrier may be rejected until appropriate actions are taken to prevent further risk of pollution.

In terms of emissions, and for reference information, if the vessels carrying LNG to the Terminal are not using NG as a fuel, they must use fuel with up to 0.5% sulfur in Croatian territorial waters, while the vessels that will be moored at the Terminal must use fuel with sulfur content of up to 0.1%, after 1st of January 2020, pursuant to regulations of Republic of Croatia.

9. LNG CARRIER UN-BERTHING PROCEDURE

In accordance with the national regulation and EU directives, the Agent must announce departure of the LNG carrier through the CIMIS which must be completed and accurately fulfilled at least 1 hour before ETD, as specified above.

The POC and Agent(s) must schedule Pilotage service and Towing series no later than 2 hours before the LNG carrier plans to un-berth from the Terminal and Pilot should be onboard of LNG carrier no later than 15 minutes before starting the un-mooring procedure.

In accordance with procedures from the Port Regulation and completed announcement of departure through CIMIS and scheduled Pilotage and Towing services Port Authority and Harbour Master Office Rijeka will give the permission for departure.

The un-berthing principle from the Terminal is to manoeuvre the LNG carrier into a position parallel to the FSRU heading at about 100 meters off, and then move ahead from the position of the Terminal (as shown in Figure 10.1. below).

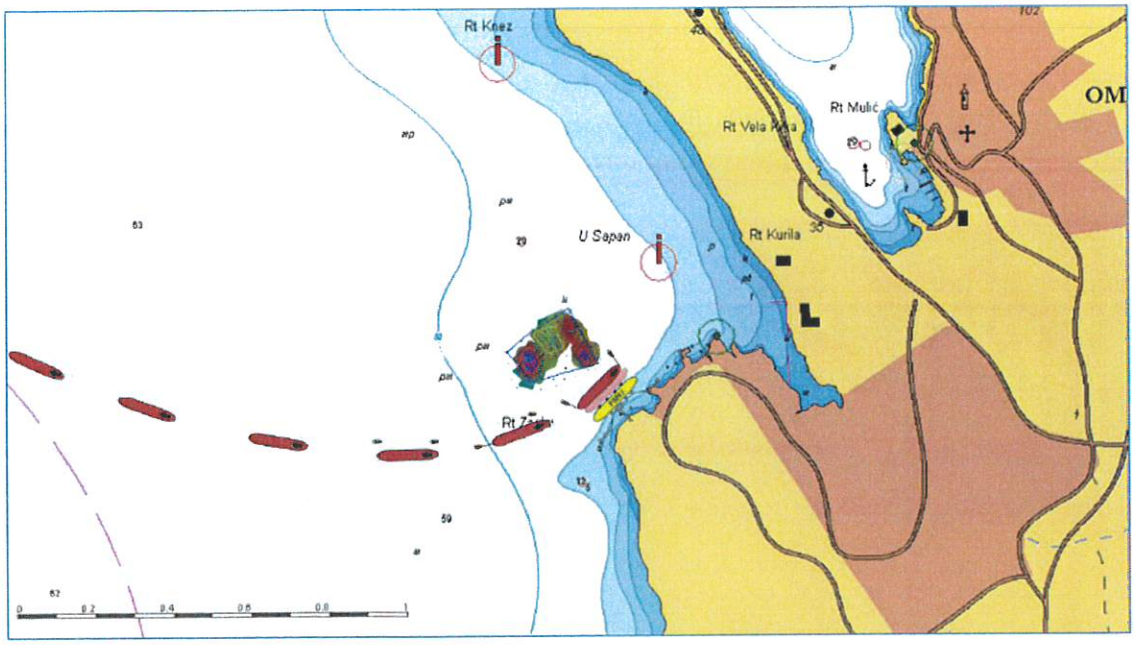

Figure 10.1. Un-berthing principle from the Terminal (figure take from the Amendment to the Maritime study, where area that needs to be dredged is indicated)

Standard workflow for un-berthing of LNG carrier from the Terminal procedure is the following:

- Pilot(s) onboard LNG carrier.
- The tugboats forward and aft of the LNG carrier are made fast.
- Single up
- All lines are let go and recovered to the LNG carrier.
- The tugboats are used to pull the LNG carrier from the Terminal.
- When the LNG carrier is safely clear of the Terminal, it is to use its own (slow ahead) propulsion.

For the un-berthing manoeuvre of the LNG carrier the main factor determining the manoeuvring mode is the prevailing direction and speed of the wind.

As opposed to arriving, the departing manoeuvre for the LNG carrier berthed at the portside of the FSRU is simpler considering that there are no obstacles in front of the bow of the LNG carrier, or in the direction of departure, so there is no need to rotate the LNG carrier. Once the mooring lines are released, the LNG carrier moves away from the Terminal with the help of one tugboat accepted on the stern, one tugboat accepted on the bow and/or bow thrusters. At a safe distance from the Terminal, of at least one width of the vessel, and using the main ship thruster and the rudder, the LNG carrier moves forward and is set an appropriate departing angle. Under favourable conditions tugboats can be released immediately upon leaving the safety zone, i.e., on a distance of 2-3 length of the LNG carrier from the Terminal.

Prior to unmooring both vessels i.e., the FSRU and LNG carrier the masters of both vessels need to understand the order in which lines will be released in order that winches can be properly manned. Unmooring operations should be conducted in accordance with procedures agreed between both master's and particular attention should be given to prevailing weather and tidal conditions.

The recommended unmooring sequence will be aligned between LNG carrier Master and Pilot after alignment with FSRU vessel Master. Before releasing the lines, the tugboats must be fastened to the forward and aft ends of the vessel on a long line.

Upon entry into force of this version of the document, its previous version KUO-1-1-1 shall be repealed.

Managing Director

LNG HRVATSKA d.o.o. za poslovanje ukapljenim prirodnim plinom ZAGREB Radnička cesta 80 OIB 53902625891

Hrvoje Krhen