

	Company:	<b>LNG Croatia LLC (LNG Hrvatska d.o.o.)</b> Slavonska avenija 1B, Zagreb, Croatia		Version/Revision 3/0	
	Facility:	<b>LNG Terminal</b>		Document number: TUO-1-3	
	Document title:	Terminal Technical Characteristics		Page/of 1 / 35	Date of creation: 25.07.2022
	Valid from:	29.07.2022			

## TERMINAL TECHNICAL CHARACTERISTICS

	Company:	<b>LNG Croatia LLC (LNG Hrvatska d.o.o.)</b> Slavonska avenija 1B, Zagreb, Croatia	Version/Revision 3/0	
	Facility:	<b>LNG Terminal</b>	Document number: TUO-1-3	
	Document title:	Terminal Technical Characteristics	Page/of 2 / 35	Date of creation: 25.07.2022
	Valid from:	29.07.2022		

## Contents


<i>DEFINITIONS</i> .....	3
<i>ABBREVIATIONS</i> .....	5
<i>1. TECHNICAL CHARACTERISTICS OF THE TERMINAL</i> .....	6
1.1. <i>FSRU</i> .....	6
1.2. <i>Jetty with auxiliary facilities</i> .....	7
1.3. <i>Connecting NG pipeline</i> .....	10
<i>2. LNGC APPROVAL AND REGISTRATION PROCEDURE AT THE TERMINAL</i> .....	11
2.1. <i>LNGC approval procedure</i> .....	12
2.1.1. <i>Verification of technical compatibility of the LNGC with the Terminal</i> .....	13
2.1.2. <i>Verification of necessary LNGC documentation</i> .....	14
2.1.2.1. <i>List of necessary documentation/certificates</i> .....	14
2.1.2.2. <i>LNGC to Terminal compatibility checklist</i> .....	14
2.1.2.3. <i>CoU</i> .....	14
2.1.3. <i>Terminal Acceptance Certificate</i> .....	15
2.2. <i>LNGC registration procedure</i> .....	15
2.2.1. <i>ETA notices</i> .....	17
2.2.2. <i>NOR exchange process description</i> .....	17
2.3. <i>Pre-transfer meeting documentation exchange process description</i> .....	18
2.4. <i>Departure documentation exchange process description</i> .....	18
<i>3. TERMINAL COMMUNICATION</i> .....	21
<i>4. LNGC BERTHING PROCEDURE</i> .....	22
4.1. <i>Approaching manoeuvres</i> .....	22
4.2. <i>Pilotage requirements at the Port/Terminal</i> .....	25
4.3. <i>Towing requirements at the Port/Terminal</i> .....	25
4.4. <i>Anchorage information</i> .....	26
4.5. <i>Adverse weather conditions</i> .....	26
<i>5. CARGO TRANSFER OPERATIONS</i> .....	28
<i>6. SERVICES AT THE TERMINAL</i> .....	30
<i>7. EMERGENCY PROCEDURES</i> .....	31
<i>8. ENVIRONMENTAL PROTECTION</i> .....	32
<i>9. LNGC UN-BERTHING PROCEDURE</i> .....	34

	Company:	<b>LNG Croatia LLC (LNG Hrvatska d.o.o.)</b> Slavonska avenija 1B, Zagreb, Croatia	Version/Revision 3/0	
	Facility:	<b>LNG Terminal</b>	Document number: TUO-1-3	
	Document title:	Terminal Technical Characteristics	Page/of	Date of creation:
	Valid from:	29.07.2022	3 / 35	25.07.2022

## DEFINITIONS


Term	Meaning
<b>Adverse Weather Conditions</b>	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.
<b>Agent</b>	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.
<b>Amendment to the Maritime study</b>	Amendment to the Maritime study 'LNG FSRU Krk' prepared by the Faculty of Maritime Studies in Rijeka, 2020, as specified below.
<b>Arrival Window</b>	A period of time assigned to an LNG carrier to arrive at the Pilot Boarding station.
<b>Boil-Off Gas</b>	Gas evaporated from LNG in cargo tanks of the FSRU/LNG carrier.
<b>Cargo</b>	LNG amount to be discharged from the LNG carrier to the Terminal.
<b>Conditions of Use</b>	An agreement which elaborates on responsibilities and connected liabilities of LNG carriers, as specified below.
<b>Estimated Time of Arrival</b>	Estimated time of LNG carrier arrival at the Pilot Boarding Station.
<b>FSRU Vessel</b>	The Floating Storage and Regasification Unit operated by the FSRU O&M provider and owned by Terminal Owner/Operator.
<b>FSRU O&amp;M provider</b>	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: <i>Golar Viking Management d.o.o.</i>
<b>Harbour Master Office Rijeka</b>	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.
<b>LNG</b>	Natural gas which has been converted to a liquid state at or below its boiling point (-160 °C) and at a pressure of approximately 1.01325 bar.
<b>LNG Carrier</b>	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.
<b>LNG Carrier representative</b>	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.
<b>LNG Heel</b>	Minimum LNG amount, expressed in m <sup>3</sup> , which shall be constantly available at the cargo tanks of the FSRU/LNG carrier.



	Company: <b>LNG Croatia LLC (LNG Hrvatska d.o.o.)</b> Slavonska avenija 1B, Zagreb, Croatia	Version/Revision 3/0	
	Facility: <b>LNG Terminal</b>	Document number: TUO-1-3	
	Document title: Terminal Technical Characteristics	Page/of 4 / 35	Date of creation: 25.07.2022
	Valid from: 29.07.2022		

<b>Notice of readiness</b>	Notice issued by the responsible person of the LNG carrier concerning the readiness of the LNG carrier for cargo transfer operations at the Terminal.
<b>Maritime study</b>	Maritime Study 'LNG FSRU Krk' prepared by the Faculty of Maritime Studies in Rijeka, 2017, as specified below.
<b>Pilot</b>	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.
<b>Port</b>	Special Purpose Port - Industrial port LNG Terminal, Omišalj – Njivice.
<b>Port Authority</b>	Official Representatives of Special Purpose Port - Industrial port LNG Terminal, Omišalj – Njivice.
<b>Port Regulation</b>	Ordinance on order in Special Purpose Port - Industrial port LNG Terminal, Omišalj – Njivice.
<b>Rules of operation of the LNG Terminal</b>	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.
<b>Surveyor</b>	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.
<b>Terminal</b>	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.
<b>Terminal User</b>	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.
<b>Terminal Owner/ Operator</b>	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.



	Company:	<b>LNG Croatia LLC (LNG Hrvatska d.o.o.)</b> Slavonska avenija 1B, Zagreb, Croatia	Version/Revision 3/0	
	Facility:	<b>LNG Terminal</b>	Document number: TUO-1-3	
	Document title:	Terminal Technical Characteristics	Page/of 5 / 35	Date of creation: 25.07.2022
	Valid from:	29.07.2022		

## 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

	Company: <b>LNG Croatia LLC (LNG Hrvatska d.o.o.)</b> Slavonska avenija 1B, Zagreb, Croatia	Version/Revision 3/0	
	Facility: <b>LNG Terminal</b>	Document number: TUO-1-3	
	Document title: Terminal Technical Characteristics	Page/of 6 / 35	Date of creation: 25.07.2022
	Valid from: 29.07.2022		

## 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 87/21) 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](http://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:

- Liquefied 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 (hereinafter: LNGC), in terms of cargo (LNG) conditions are provided in table 1.2. below.



	Company:	<b>LNG Croatia LLC (LNG Hrvatska d.o.o.)</b> Slavonska avenija 1B, Zagreb, Croatia	Version/Revision 3/0	
	Facility:	<b>LNG Terminal</b>	Document number: TUO-1-3	
	Document title:	Terminal Technical Characteristics	Page/of	Date of creation:
	Valid from:	29.07.2022	7 / 35	25.07.2022

**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 LNGCs and bunker/ feeder vessels that can berth alongside FSRU/on the Terminal (in m <sup>3</sup> )	3,500 – 265,000 <sup>1</sup>
Regasification system	
Maximum NG send-out rate (in Sm <sup>3</sup> /hr) <sup>2</sup>	451,840
Nominal NG send-out rate (in Sm <sup>3</sup> /hr)	338,000
Minimum NG send-out rate (in Sm <sup>3</sup> /hr)	60,000
Operational pressure of the regasification system (in barg)	70 – 95
Maximum cargo tanks operating pressure (in mbarg)	400
LNG transfer (loading/reloading) system	
LNG Gross storage capacity on the FSRU (in m <sup>3</sup> )	140,206
Capacity of storage tanks at normal filling level (98,5%) (in m <sup>3</sup> )	138,104
Maximum LNG loading/transfer capacity (in m <sup>3</sup> /hr)	8,000
Minimum LNG loading/transfer capacity	TBD (pre-transfer meeting)
LNG reloading capacity (to feeder/bunker vessels) (in m <sup>3</sup> /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 <sup>3</sup> )	2,800

**Table 1.2.** LNGC cargo conditions requirements

LNGC cargo (LNG) conditions requirements <sup>3</sup>	
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 LNGCs 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.


<sup>1</sup> Depending also on the results of the conducted Compatibility study.

<sup>2</sup> The FSRU vessel will operate with a maximum regasification capacity/send-out rate of up to 338,000 Nm<sup>3</sup>/hr in accordance with the technical capacity of the NG transmission system of the Republic of Croatia.

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

This document is the property of LNG Croatia LLC (LNG Hrvatska d.o.o.). This document is disclosed for information and guideline purposes only and shall not be binding. LNG Croatia LLC shall not be liable or responsible for any losses or incurred damages resulting from the use of this document. This document can be periodically updated by LNG Croatia. The latest version of the document available on LNG Croatia LLC website ([www.lng.hr](http://www.lng.hr)) is relevant.




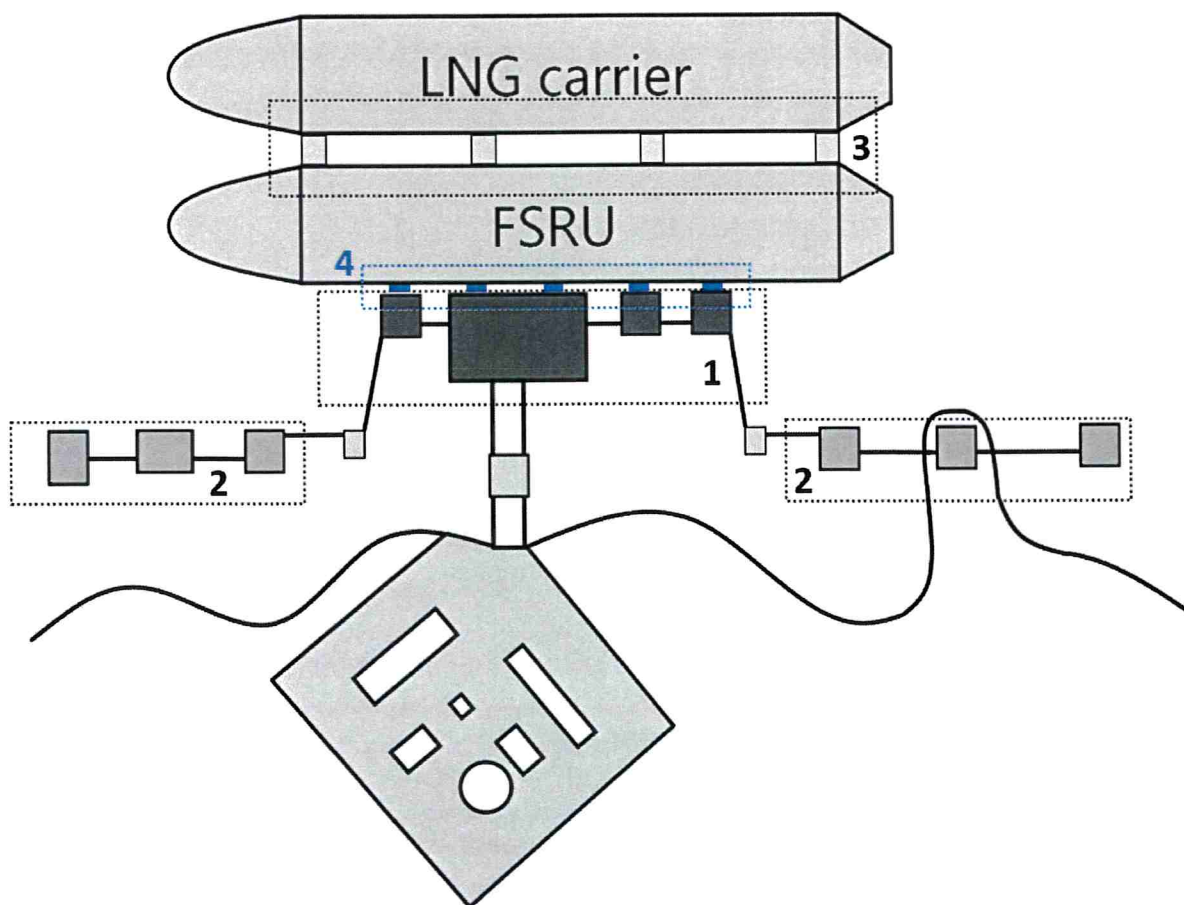
	Company:	LNG Croatia LLC (LNG Hrvatska d.o.o.) Slavonska avenija 1B, Zagreb, Croatia		Version/Revision 3/0	
	Facility:	LNG Terminal		Document number: TUO-1-3	
	Document title:	Terminal Technical Characteristics		Page/of	Date of creation:
	Valid from:	29.07.2022		8 / 35	25.07.2022

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 LNGCs, 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 intended 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 LNGCs.
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 LNGC, and **two (2) 'baby' fenders** (not indicated on figure 1.1. below). By applying the use of mentioned fenders, acceptance of LNGCs of storage capacity between 3,500m<sup>3</sup> and 265,000m<sup>3</sup> is 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).

	Company:	LNG Croatia LLC (LNG Hrvatska d.o.o.) Slavonska avenija 1B, Zagreb, Croatia	Version/Revision 3/0	
	Facility:	LNG Terminal	Document number: TUO-1-3	
	Document title:	Terminal Technical Characteristics	Page/of	Date of creation:
	Valid from:	29.07.2022	9 / 35	25.07.2022




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

The jetty head, breasting dolphins and mooring dolphins for FSRU and LNGC 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.

	Company:	LNG Croatia LLC (LNG Hrvatska d.o.o.) Slavonska avenija 1B, Zagreb, Croatia		Version/Revision 3/0	
	Facility:	LNG Terminal		Document number: TUO-1-3	
	Document title:	Terminal Technical Characteristics		Page/of	Date of creation:
	Valid from:	29.07.2022		10 / 35	25.07.2022

### 1.3. Connecting NG pipeline

The connecting NG pipeline has the following technical characteristics:

- Nominal diameter – DN 1000,
- Maximal operating pressure –100 (barg),
- 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.



	Company:	LNG Croatia LLC (LNG Hrvatska d.o.o.) Slavonska avenija 1B, Zagreb, Croatia	Version/Revision 3/0	
	Facility:	LNG Terminal	Document number: TUO-1-3	
	Document title:	Terminal Technical Characteristics	Page/of 11 / 35	Date of creation: 25.07.2022
	Valid from:	29.07.2022		

## 2. LNGC APPROVAL AND REGISTRATION PROCEDURE AT THE TERMINAL

LNGC 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 LNGCs 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 LNGC 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](http://www.lng.hr)). Full set of documentation is provided only to registered Terminal Users i.e., to POCs of the nominated LNGC 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/registration procedure needs to be carried out in coordination between Master of the LNGC/Terminal User/responsible 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,
- LNGC representative/owner/operator/charterer,
- LNGC 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 LNGC representative/owner/operator/charterer, Agent, and other person having a justified reading/interest, who were designated as POC.

	Company:	LNG Croatia LLC (LNG Hrvatska d.o.o.) Slavonska avenija 1B, Zagreb, Croatia		Version/Revision 3/0	
	Facility:	LNG Terminal		Document number: TUO-1-3	
	Document title:	Terminal Technical Characteristics		Page/of	Date of creation:
	Valid from:	29.07.2022		12 / 35	25.07.2022

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

- **LNGC approval procedure**
- **LNGC registration procedure**

### **LNGC approval procedure**

- **Compatibility documentation exchange**
  - Documentation by which technical compatibility of the LNGC 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.

### **LNGC 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.

In addition to the approval and registration procedure at the Terminal, LNGC 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](http://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. LNGC approval procedure**

The process of verifying the compatibility of LNGC with the Terminal i.e., approval procedure of LNGC at the Terminal consists of various interconnected segments. These segments include



	Company:	<b>LNG Croatia LLC (LNG Hrvatska d.o.o.)</b> Slavonska avenija 1B, Zagreb, Croatia	Version/Revision 3/0	
	Facility:	<b>LNG Terminal</b>	Document number: Tuo-1-3	
	Document title:	Terminal Technical Characteristics	Page/of 13 / 35	Date of creation: 25.07.2022
	Valid from:	29.07.2022		

approval of technical compatibility of the LNGC with the Terminal, verification of LNGC documentation, alongside with the signature of the Conditions of Use document (hereinafter: CoU).

After LNGC 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](http://www.lng.hr)). **The completed form for the approval of the LNGC shall be delivered to Terminal Operator not later than thirty (30) days prior to the arrival window of the LNGC at the PBS** or exceptionally outside the specified deadline when the Terminal Operator agrees therewith. Based on the validity of the received request, the Terminal Operator will deliver the Berth Package to the POC. Based on the received Berth Package, the POC shall 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.
- **LNGC 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.
  - *LNGC to Terminal compatibility 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 LNGC with the Terminal**

Technical compatibility of the LNGC 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 LNGC 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 LNGC planned to arrive to the Terminal.

Result of the Compatibility study will be the proposed LNGC to Terminal mooring plan, which needs to be verified by the Terminal Operator and FSRU O&M provider. The Terminal



	Company: <b>LNG Croatia LLC (LNG Hrvatska d.o.o.)</b> Slavonska avenija 1B, Zagreb, Croatia	Version/Revision 3/0	
	Facility: <b>LNG Terminal</b>	Document number: TUO-1-3	
	Document title: Terminal Technical Characteristics	Page/of 14 / 35	Date of creation: 25.07.2022
	Valid from: 29.07.2022		

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 LNGC documentation**

Alongside with the determination of technical compatibility of the LNGC 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 LNGC 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. LNGC to Terminal compatibility checklist**


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

A part of the LNGC 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. CoU**

**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 LNGCs 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 LNGC calling at the Terminal.

The CoU needs to be signed by every Master of the LNGC 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 LNGC can be rejected from the Terminal and may not berth on the Terminal.

	Company:	LNG Croatia LLC (LNG Hrvatska d.o.o.) Slavonska avenija 1B, Zagreb, Croatia		Version/Revision 3/0	
	Facility:	LNG Terminal		Document number: TUO-1-3	
	Document title:	Terminal Technical Characteristics		Page/of	Date of creation:
	Valid from:	29.07.2022		15 / 35	25.07.2022

### 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 LNGC a **Terminal Acceptance Certificate (hereinafter: TAC)**.

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

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

### 2.2. LNGC registration procedure


After the acceptance certificate was issued for the arriving LNGC, and arrival and mooring at the Terminal is allowed, the LNGC must conduct the LNGC registration procedure. After LNGC 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](http://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 LNGC 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 LNGC, as specified below. Additionally, the Agent needs to be aware of the LNGC leaving the loading port, as the **Agent needs to conduct several activities in CIMIS and contact the Port Authority**.



	Company:	LNG Croatia LLC (LNG Hrvatska d.o.o.) Slavonska avenija 1B, Zagreb, Croatia		Version/Revision 3/0	
	Facility:	LNG Terminal		Document number: TUO-1-3	
	Document title:	Terminal Technical Characteristics		Page/of	Date of creation:
	Valid from:	29.07.2022		16 / 35	25.07.2022

Alongside with the delivery of necessary documentation, the POC/Agent needs to provide **Estimated Time of Arrival** (hereinafter: ETA) of the LNGC 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) **Bill of Lading,**
- b) **Independent surveyor's report on the cargo loaded at the port of loading,**
- c) **Cargo Manifest ,**
- d) **Cargo Origin Certificate,**
- e) **Cargo Quantity Certificate,**
- f) **Cargo Quality Certificate,**
- g) **Cargo Safety Data Sheet,**
- h) **Declaration on the activities of the carrier at the port of loading (Time Log/Port Timesheet),**
- i) **Master's receipt of Documents.**


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 ; Discharge Order form is available on the web pages of the Terminal Operator ([www.lng.hr](http://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 LNGC 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 LNGC 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.



	Company:	<b>LNG Croatia LLC (LNG Hrvatska d.o.o.)</b> Slavonska avenija 1B, Zagreb, Croatia	Version/Revision 3/0	
	Facility:	<b>LNG Terminal</b>	Document number: TUO-1-3	
	Document title:	Terminal Technical Characteristics	Page/of	Date of creation:
	Valid from:	29.07.2022	17 / 35	25.07.2022

### 2.2.1. ETA notices

**ETA Notice of the LNGC 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 LNGC to the PBS has been estimated to be within 24 hours, the estimated arrival window of the LNGC to the PBS shall be updated **every six hours**.

If the cargo to be unloaded has been acquired or diverted to the Terminal, after the departure of the LNGC 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 LNGC shall notify to the Maritime Authorities.


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

In accordance with the Republic of Croatia regulations and EU directives, the Agent must announce arrival of the LNGC through the CIMIS at least 72 hours before the LNGC 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 LNGC, which is defined as period of time assigned to an LNGC 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 LNGC:

- 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 port side manifold to proceed to moor at the Terminal and commence cargo transfer operations.

	Company:	LNG Croatia LLC (LNG Hrvatska d.o.o.) Slavonska avenija 1B, Zagreb, Croatia		Version/Revision 3/0	
	Facility:	LNG Terminal		Document number: TUO-1-3	
	Document title:	Terminal Technical Characteristics		Page/of	Date of creation:
	Valid from:	29.07.2022		18 / 35	25.07.2022

The NOR must at least include the following:

- Statement that the LNGC 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, LNGC 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 LNGC.

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 are completed and signed during the pre-transfer meeting:

- Communication agreement,
- Cargo handling agreement,
- Safety checklist(s).

**After all relevant documents are signed, and Terminal/FSRU representatives makes the safety round on the LNGC, the LNGC 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 LNGC is ready for un-berthing procedure, in accordance with the regulation of Republic of Croatia and EU directives, Agent must announce departure of the LNGC 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.



	Company:	LNG Croatia LLC (LNG Hrvatska d.o.o.) Slavonska avenija 1B, Zagreb, Croatia	Version/Revision 3/0	
	Facility:	LNG Terminal	Document number: TUO-1-3	
	Document title:	Terminal Technical Characteristics	Page/of	Date of creation:
	Valid from:	29.07.2022	19 / 35	25.07.2022


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

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

**Table 2.1.** Basic overview of the document exchange procedure:

Step	Description	
<b>1</b>	<b>Compatibility documentation exchange</b>	
<b>1.1</b>	LNGC 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 <i>Request for Approval</i> to the Terminal Operator.	
<b>1.2</b>	Based on the request the Terminal Operator delivers the <i>Berth Package</i> consisting of: <ul style="list-style-type: none"> <li>1. <i>Berth file</i></li> <li>2. <i>List of necessary documentation/certificates</i></li> <li>3. <i>LNGC to Terminal compatibility checklist</i></li> <li>4. <i>CoU</i></li> </ul>	
<b>1.3</b>	Based on the Berth file the POC conducts the Compatibility study.	
<b>1.4</b>	Additionally, POC needs to deliver documents/certificates, and the full list of documentation is specified below. Also, POC should deliver the fulfilled LNGC to Terminal compatibility checklist. Part of the checklist needs to be fulfilled with the results of the Compatibility study.	
<b>1.5</b>	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/FSRU O&M provider. Based on the information/documentation provided, the FSRU O&M provider/Terminal Operator conducts the vetting/approval procedure.	
<b>1.6</b>	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.
<b>1.7</b>	If the mooring plan is technically not possible, the LNGC 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 LNGC can be rejected from the Terminal.


This document is the property of LNG Croatia LLC (LNG Hrvatska d.o.o.). This document is disclosed for information and guideline purposes only and shall not be binding. LNG Croatia LLC shall not be liable or responsible for any losses or incurred damages resulting from the use of this document. This document can be periodically updated by LNG Croatia. The latest version of the document available on LNG Croatia LLC website ([www.lng.hr](http://www.lng.hr)) is relevant.

	Company:	LNG Croatia LLC (LNG Hrvatska d.o.o.) Slavonska avenija 1B, Zagreb, Croatia	Version/Revision 3/0	
	Facility:	LNG Terminal	Document number: TUO-1-3	
	Document title:	Terminal Technical Characteristics	Page/of	Date of creation:
	Valid from:	29.07.2022	20 / 35	25.07.2022

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 <b>TAC</b> by which the LNGC is approved.
2.	<b>Loading port documentation</b>
2.1	Upon departure from the loading port, the POC must send an email to the Terminal Operator representative containing all necessary <b>Loading port documentation</b> , including the <b>Request for Registration</b> .
2.2	Additionally, the Agent needs to be aware of the LNGC 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 <b>Estimated Time of Arrival notification</b> of the LNGC to the Terminal Operator, as specified below.
3	<b>Discharge Order</b>
3.1	<b>Discharge Order</b> , 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 PBS.
4	<b>NOR</b>
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 <b>NOR</b> to Terminal Operator, by which readiness of the LNGC 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 LNGC 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	<b>Pre-transfer meeting</b>
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 LNGC. Authorized personnel are transported from the FSRU to the LNGC. A set of <b>Pre-transfer documents</b> is signed between respective parties.
5.2	Once all documents are signed, cargo transfer operation may start.
6	<b>LNGC departure</b>
6.1	After cargo transfer operation is completed, in accordance with the regulation of Republic of Croatia and EU directives, <b>Agent must contact the Port Authority and announce departure of the LNGC through the CIMIS</b> 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 LNGC from the Terminal, according to ETD.

This document is the property of LNG Croatia LLC (LNG Hrvatska d.o.o.). This document is disclosed for information and guideline purposes only and shall not be binding. LNG Croatia LLC shall not be liable or responsible for any losses or incurred damages resulting from the use of this document. This document can be periodically updated by LNG Croatia. The latest version of the document available on LNG Croatia LLC website ([www.lng.hr](http://www.lng.hr)) is relevant.



	Company:	LNG Croatia LLC (LNG Hrvatska d.o.o.) Slavonska avenija 1B, Zagreb, Croatia		Version/Revision 3/0	
	Facility:	LNG Terminal		Document number: TUO-1-3	
	Document title:	Terminal Technical Characteristics		Page/of	Date of creation:
	Valid from:	29.07.2022		21 / 35	25.07.2022

### 3. TERMINAL COMMUNICATION

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

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.

	Company:	LNG Croatia LLC (LNG Hrvatska d.o.o.) Slavonska avenija 1B, Zagreb, Croatia		Version/Revision 3/0	
	Facility:	LNG Terminal		Document number: TUO-1-3	
	Document title:	Terminal Technical Characteristics		Page/of	Date of creation:
	Valid from:	29.07.2022		22 / 35	25.07.2022

#### 4. LNGC BERTHING PROCEDURE

**Objective of the mooring of the LNGC alongside the FSRU/Terminal is the following:**

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

**As per maritime regulations, tugboats will be used to:**

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

According to the Maritime study, two approach manoeuvres to the Port/Terminal are to be used. However, Pilots will, in agreement with Master of the LNGC, determine the optimal approach to the Terminal. Approaching manoeuvres are described in section below.

##### 4.1.Approaching manoeuvres

During pilotage operations, when entering the safety/restricted zone of the Terminal and while berthed alongside the Terminal, LNGC must have the chain stoppers, locking pins and other securing devices in place on all anchors to prevent accidental release.

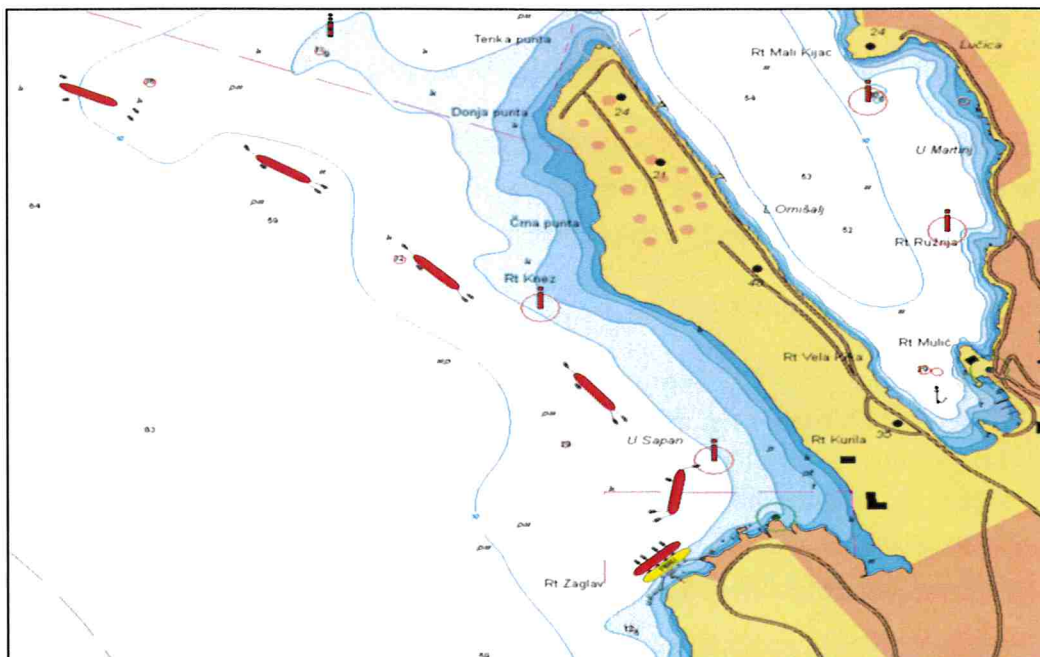
If the LNGC becomes sub-standard from the arrival from PBS to the Terminal, the LNGC will not receive authorization from the Port Authority/ Master of the FSRU to start the berthing operation, until all outstanding issues are resolved. Master of the LNGC needs to report immediately any deficiencies that may occur to the Port Authority and Master of the FSRU.

##### *First approach manoeuvre*

- Approaching from the inner part of the Rijeka bay and by directly arriving at the Terminal. In this case, approaching LNGC must approach the Terminal from NNW in direction of the red mark directly in front of Cape Knez.




	Company: <b>LNG Croatia LLC (LNG Hrvatska d.o.o.)</b> Slavonska avenija 1B, Zagreb, Croatia	Version/Revision 3/0	
	Facility: <b>LNG Terminal</b>	Document number: TUO-1-3	
	Document title: Terminal Technical Characteristics	Page/of 23 / 35	Date of creation: 25.07.2022
	Valid from: 29.07.2022		



**Figure 4.1.** First approach manoeuvre

- Two tugboats for towing are accepted on the bow and one on the stern of LNGC through the fairlead, while one tugboat for pushing is accepted on the starboard.
- From the red mark of the Cape Knež LNGC navigates along the coastline until it reaches other red mark in front of the Cape Kurila. Between the final mark and the Terminal, almost parallel with the Terminal, LNGC must rotate through 90° to the right using tugboats. In the final stage, LNGC is placed parallel to the Terminal to a location approximately one width of LNGC away from the Terminal. Bow tugboat is then released and placed along the portside on the bow for pushing.
- Upon arriving and stopping parallel to the Terminal, the side tugboats begin pushing LNGC towards the Terminal. The thrust force depends on direction and speed of the wind, and to a lesser extent on the effect of sea currents and waves. In the event LNGC needs to be moved longitudinally, the main ship thruster will be used. The usual speed of LNGC's approach to the Terminal should be up to 0.15 m/s and is limited by the use of tugboats for pushing at the end part of the bow and stern. The speed of LNGC's approach can also be regulated using side tugboats which can shift from pushing LNGC to pulling LNGC and vice versa, using the direction opposite the action of the bow thrusters. Based on the agreement between the Pilot and Master of the LNGC, in the final stage of side approach of LNGC, tugboat that pulls on the bow and/or stern can release its towage and commence pushing.

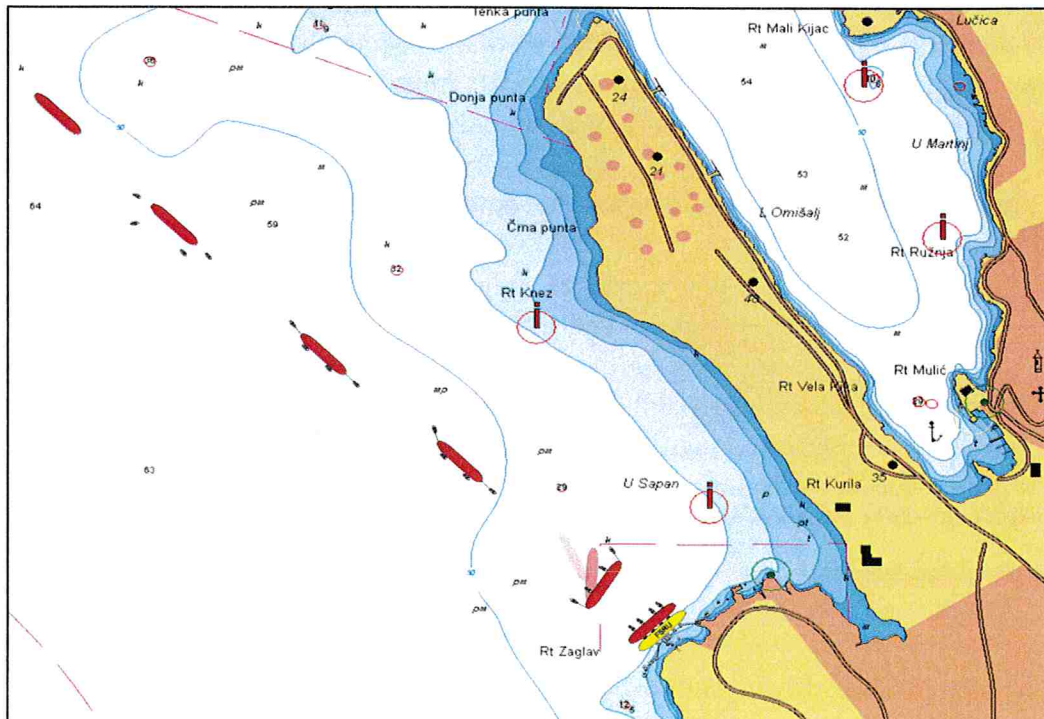
	Company:	LNG Croatia LLC (LNG Hrvatska d.o.o.) Slavonska avenija 1B, Zagreb, Croatia		Version/Revision 3/0	
	Facility:	LNG Terminal		Document number: TUO-1-3	
	Document title:	Terminal Technical Characteristics		Page/of	Date of creation:
	Valid from:	29.07.2022		24 / 35	25.07.2022

- Once the LNGC is sufficiently near the Terminal, mooring lines are placed, usually the springs first, and then the breast lines, forward lines and stern lines.

This approach won't be used by the largest LNGCs. For the largest LNGCs, with relatively modest manoeuvring capacity, the manoeuvre of direct arrival, which is described below as 'second approach manoeuvre', is used, if possible.

### ***Second approach manoeuvre***


- LNGC approaches the Terminal directly by bow at a reduced speed. In this case, the direction of arrival is not critical. Two tugboats are accepted on the bow and stern of the LNGC, one is accepted for pulling through fairlead or other suitable place, and another side tugboat is accepted for pushing. One to two lengths of LNGC before the Terminal, using its own thrust and with the help of a tugboat, LNGC is almost completely stopped, and starts rotating sideward through 90°.
- The power used for rotating is mostly that of the tugboat on the bow for pulling and the tugboat on the side of the stern. Other tugboats help and also serve to limit the speed of LNGC's rotation. When LNGC is placed parallel to the Terminal, it is pushed sideways towards the Terminal. In this case, portside berthing manoeuvre and starboard berthing manoeuvre are the same. The final sideward approach to the Terminal and mooring takes place as in the previous case.



**Figure 4.2. Second approach manoeuvre**

This document is the property of LNG Croatia LLC (LNG Hrvatska d.o.o.). This document is disclosed for information and guideline purposes only and shall not be binding. LNG Croatia LLC shall not be liable or responsible for any losses or incurred damages resulting from the use of this document. This document can be periodically updated by LNG Croatia. The latest version of the document available on LNG Croatia LLC website ([www.lng.hr](http://www.lng.hr)) is relevant.



	Company:	LNG Croatia LLC (LNG Hrvatska d.o.o.) Slavonska avenija 1B, Zagreb, Croatia		Version/Revision 3/0	
	Facility:	LNG Terminal		Document number: TUO-1-3	
	Document title:	Terminal Technical Characteristics		Page/of	Date of creation:
	Valid from:	29.07.2022		25 / 35	25.07.2022

#### 4.2. Pilotage requirements at the Port/Terminal

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

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

The pilot boarding station of Costal pilotage is positioned on the following coordinates: **LAT 44° 56,2" N, LONG 14° 13,0" E**, while the pilot boarding station of Port pilotage is positioned on the following coordinates: **LAT 45° 11,781" N, LONG 14° 29,157" E**.

**The Terminal/FSRU representative is not responsible for the availability, provision or performance of Pilot(s).**

#### 4.3. Towing requirements at the Port/Terminal

Tugboats support of LNGCs arriving and departing from the Port/Terminal is mandatory. The POC and Agents must schedule Towing service before LNGC 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 LNGC early departure or emergency situations.

This document is the property of LNG Croatia LLC (LNG Hrvatska d.o.o.). This document is disclosed for information and guideline purposes only and shall not be binding. LNG Croatia LLC shall not be liable or responsible for any losses or incurred damages resulting from the use of this document. This document can be periodically updated by LNG Croatia. The latest version of the document available on LNG Croatia LLC website ([www.lng.hr](http://www.lng.hr)) is relevant.

	Company:	LNG Croatia LLC (LNG Hrvatska d.o.o.) Slavonska avenija 1B, Zagreb, Croatia		Version/Revision 3/0	
	Facility:	LNG Terminal		Document number: TUO-1-3	
	Document title:	Terminal Technical Characteristics		Page/of	Date of creation:
	Valid from:	29.07.2022		26 / 35	25.07.2022

In case an LNGC 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 (MD1 and MD6) of the Terminal, the LNGC needs to coordinate placement/un-placement of such lines with the Agent. **Terminal is not responsible for providing such mooring/unmooring services and LNGC representative needs to organize such activity with the Agent by themselves.** Transport of lines from LNGC to Terminal mooring elements MD1 and MD6 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.

#### 4.4. 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.


#### 4.5. Adverse weather conditions

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

Prior LNGC calling the Port and during LNGC's stay at Terminal, Master of the LNGC and Master of the FSRU, as well as Port and Terminal responsible personnel, have to receive and monitor weather reports from Croatian Meteorological and Hydrological Service (hereinafter: 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, SWT current and tides and wave height.



	Company:	LNG Croatia LLC (LNG Hrvatska d.o.o.) Slavonska avenija 1B, Zagreb, Croatia		Version/Revision 3/0	
	Facility:	LNG Terminal		Document number: TUO-1-3	
	Document title:	Terminal Technical Characteristics		Page/of	Date of creation:
	Valid from:	29.07.2022		27 / 35	25.07.2022

**Reports from Terminal environmental monitoring system are considered to be the relevant and should be used as weather reference for decision made by Port Authority, LNGC 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.**

	Company:	LNG Croatia LLC (LNG Hrvatska d.o.o.) Slavonska avenija 1B, Zagreb, Croatia		Version/Revision 3/0	
	Facility:	LNG Terminal		Document number: TUO-1-3	
	Document title:	Terminal Technical Characteristics		Page/of	Date of creation:
	Valid from:	29.07.2022		28 / 35	25.07.2022

## 5. CARGO TRANSFER OPERATIONS

The LNGC 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 LNGC. 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 LNGC prior start of cargo transfer operations to determine functionality of the LNGC.

The Master of the FSRU vessel 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 Master of the LNGC is to be fully consulted during any of the actions made by the Master of the FSRU. The Master of the LNGC can also stop the cargo transfer operation for safety reasons as well, if he determines that LNGC 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 LNGC by two (2) hoses, unless otherwise agreed at the pre-transfer meeting. The CTMS system which is located on the LNGC 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 Master of the FSRU /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 LNGC 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 LNGC. The ESD procedures include warm and cold ESD test and they are to be conducted by the Terminal/LNGC/FSRU representatives, where applicable. Once the Cold ESD test is successfully performed, transfer of the LNG from the LNGC to the FSRU may commence.




	Company:	<b>LNG Croatia LLC (LNG Hrvatska d.o.o.)</b> Slavonska avenija 1B, Zagreb, Croatia	Version/Revision 3/0	
	Facility:	<b>LNG Terminal</b>	Document number: TUO-1-3	
	Document title: Terminal Technical Characteristics		Page/of 29 / 35	Date of creation: 25.07.2022
	Valid from: 29.07.2022			

A post-cargo transfer meeting will be held on the LNGC 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 Master of the LNGC for cargo handling operations on board the LNGC 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 LNGC 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.

	Company:	LNG Croatia LLC (LNG Hrvatska d.o.o.) Slavonska avenija 1B, Zagreb, Croatia		Version/Revision 3/0	
	Facility:	LNG Terminal		Document number: TUO-1-3	
	Document title:	Terminal Technical Characteristics		Page/of	Date of creation:
	Valid from:	29.07.2022		30 / 35	25.07.2022


## 6. SERVICES AT THE TERMINAL

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

<b>Provision, stores, and crew changes</b>	There are no facilities for provisions of storing or crew changes at the Port. Master of the LNGC and Agents must schedule crew changes or stores deliveries prior to berthing, after un-berthing, or while at anchor. While LNGC is berthed alongside the Terminal, support vessels may not approach LNGC and stores and/or spares may not be loaded or unloaded.
<b>Repairs &amp; hull cleaning</b>	Repair and hull cleaning activities within Port/Terminal safety zone are not permitted.
<b>Medical care</b>	Emergency medical evacuation to shore may be organized by the Agent at the expense of LNGC. If the Agent or LNGC's representative requests medical evacuation, the Agent is responsible for logistical arrangements for the evacuees upon arrival on shore.
<b>Bunkers and portable water</b>	There are no bunkering or potable water facilities at the Port, fuel supply of LNGCs is not permitted within the Port/Terminal exclusion/safety 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.
<b>Garbage/ sewage facilities at the Terminal</b>	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, which can be found as Annex 7 to this TCT prior to arriving at the Terminal. The material cannot be transferred to FSRU under any circumstances

**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.**



	Company:	<b>LNG Croatia LLC (LNG Hrvatska d.o.o.)</b> Slavonska avenija 1B, Zagreb, Croatia	Version/Revision 3/0	
	Facility:	<b>LNG Terminal</b>	Document number: TUO-1-3	
	Document title:	Terminal Technical Characteristics	Page/of 31 / 35	Date of creation: 25.07.2022
	Valid from:	29.07.2022		

## 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 Master of LNGC arriving at the Port/Terminal is always fully responsible for the safe navigation and operation of their LNGC. Master of the LNGC's and crew must take all necessary safety precautions while conducting cargo (LNG) transfer operations including efficient handling with any connected hazard.

Throughout the stay in the Port/Terminal, LNGC needs to have sufficient qualified crew onboard the vessel for safe operation activities, which are also capable to respond to any emergency situation that might occur.

To ensure quick and safe disconnection of LNGC from the Terminal, the FSRU/Terminal is, respectively, equipped with:

- Emergency Release Couplings (hereinafter: ERC) on the cargo transfer hoses connection and the connection between the FSRU and the onshore HP offloading arms.
- Remote QRH system.

Both systems can be operated from the FSRU CCR in the event of an emergency situations which can place any of the vessels in extreme risk.

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 on permanent stand-by in case of LNGC early departure or emergency situations

Boilers, main engines, steering machinery and other equipment essential for maneuvering of the LNGC must be kept in state of readiness whilst the LNGC is berthed at the Terminal, so the LNGC 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 LNGC in such emergency situations, as defined above. Response to specific emergencies will be agreed during the pre-transfer meeting.

	Company:	LNG Croatia LLC (LNG Hrvatska d.o.o.) Slavonska avenija 1B, Zagreb, Croatia	Version/Revision 3/0	
	Facility:	LNG Terminal	Document number: TUO-1-3	
	Document title:	Terminal Technical Characteristics	Page/of	Date of creation:
	Valid from:	29.07.2022	32 / 35	25.07.2022

## 8. ENVIRONMENTAL PROTECTION

All vessels operating in the waters of the Republic of Croatia, including the waters of the Port/Terminal 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 LNGC /POC may contact the Port Authority and the Agent if there are doubts regarding environmental protection regulations in the Port and Terminal area. All LNGC transferring cargo 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. LNGC representatives, alongside with all visiting vessels/personnel 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 Authority and Terminal Operator.

LNGC crew is to maintain constant lookout during the cargo transfer operation in order to detect and prevent leaks that may occur. Cargo transfer hoses connections are leak tested by the FSRU crew with nitrogen before cargo transfer operation start. The test pressure is agreed between LNGC representative and FSRU vessel representative during the pre-transfer meeting and is dependent on the planned maximum operating pressure.

All unused LNGC's cargo and bunker connections must remain closed and blanked during the stay at the Terminal. Internal transfer of LNGC bunkers is not permitted whilst berthed alongside the Terminal.

**Venting of cargo vapor to the atmosphere from LNGCs is strictly prohibited in the Restricted area of the Port/Terminal.**

If such serious incident occurs, Master/representative of the LNGC must report all incidents referring to cargo vapor venting to the atmosphere to the FSRU, Terminal and Port Authority immediately after such incident has occurred. Additionally, Master/representative of the LNGC must immediately take action to prevent further accidental venting of the cargo into the atmosphere.

Due to the highly sensitive gas detection system installed on the FSRU vessel, it is important that even small gas leaks are reported immediately to the FSRU, Terminal and Port Authority to prevent ESD action from activation during cargo transfer operation. **In case of emergency, if venting occurs on LNGC, cargo transfer operations must be stopped immediately, and Master of the FSRU and Terminal/Port Authority must be notified immediately.**

This document is the property of LNG Croatia LLC (LNG Hrvatska d.o.o.). This document is disclosed for information and guideline purposes only and shall not be binding. LNG Croatia LLC shall not be liable or responsible for any losses or incurred damages resulting from the use of this document. This document can be periodically updated by LNG Croatia. The latest version of the document available on LNG Croatia LLC website ([www.lng.hr](http://www.lng.hr)) is relevant.



	Company:	<b>LNG Croatia LLC (LNG Hrvatska d.o.o.)</b> Slavonska avenija 1B, Zagreb, Croatia	Version/Revision 3/0	
	Facility:	<b>LNG Terminal</b>	Document number: TUO-1-3	
	Document title:	Terminal Technical Characteristics	Page/of	Date of creation:
	Valid from:	29.07.2022	33 / 35	25.07.2022

The discharge of bilge and sewage effluents, oil, or any mixture containing oil to the sea is not permitted while the LNGC is inside the Port/Terminal area. Bilge overboard valves must be visibly locked and sealed shut. The list of locked sealed valves is to be provided to the Master of the FSRU /Port/Terminal representative on the pre-transfer meeting.

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

LNGC while inside the Port/Terminal area or moored at the Terminal must ensure air emissions are in compliance with all applicable laws and regulations. Excessive smoke emissions from LNGC's funnel and soot blowing are not permitted in the restricted/safety area of the Terminal. Use of Gas Combustion Unit (hereinafter: GCU) usage is to be fully avoided and is only permitted for safety/operation reasons, with approval from the Terminal.

Safety limit of cargo pressure in both LNGC and FSRU vessel CT systems is agreed during the pre-transfer meeting. Where LNGCs have different mean of handling BOG, i.e. reliquefaction plant, such systems can be used. However, such situations must be agreed on the pre-transfer meeting.

If the pollution prevention rules are not followed the LNGC 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, pursuant to regulations of Republic of Croatia they must use fuel with up to 0.5% sulphur in Croatian territorial waters. Also, if needed for safety reasons, in Port/Terminal area LNGCs must use fuel with sulphur content of up to 0.1%, at all times.

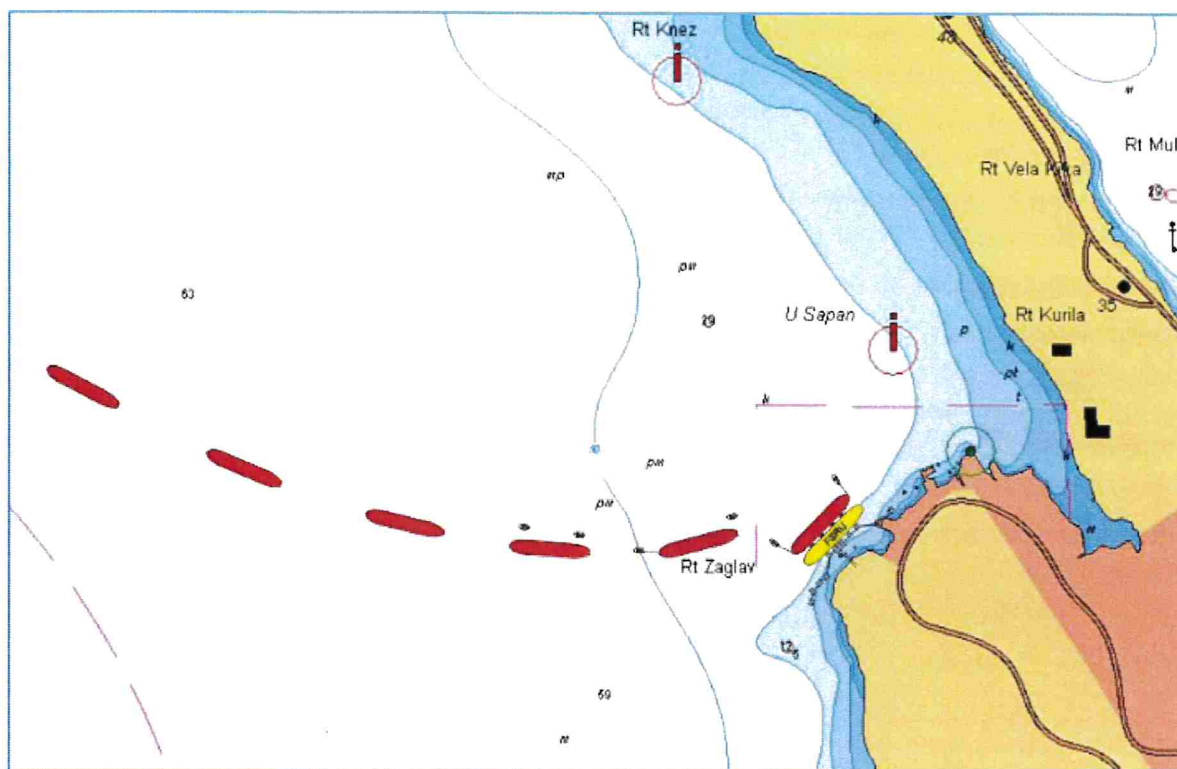
	Company:	LNG Croatia LLC (LNG Hrvatska d.o.o.) Slavonska avenija 1B, Zagreb, Croatia		Version/Revision 3/0	
	Facility:	LNG Terminal		Document number: TUO-1-3	
	Document title:	Terminal Technical Characteristics		Page/of	Date of creation:
	Valid from:	29.07.2022		34 / 35	25.07.2022

## 9. LNGC UN-BERTHING PROCEDURE

In accordance with the national regulation and EU directives, the Agent must announce departure of LNGC in accordance with Port Regulation.

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

The Port Authority, Harbour Master Office, Pilots, Tugboats will coordinate un-berthing instructions and departure of LNGC from the Terminal, according to ETD.





	Company:	LNG Croatia LLC (LNG Hrvatska d.o.o.) Slavonska avenija 1B, Zagreb, Croatia	Version/Revision 3/0	
	Facility:	LNG Terminal	Document number: TUO-1-3	
	Document title:	Terminal Technical Characteristics	Page/of	Date of creation:
	Valid from:	29.07.2022	35 / 35	25.07.2022

Standard workflow for un-berthing of LNGC from the Terminal is the following:

- Approval for departure have been issued from Port Authority.
- Visibility before un-berthing should be > 1 NM.
- Pilot(s) are onboard the LNGC.
- Tugboats are placed forward and aft of the LNGC and are made fast.
- Single up action is conducted.
- All mooring lines are let go from the FSRU and are recovered to the LNGC.
- Once the mooring lines are released, the LNGC moves away from the Terminal with the help of tugboats.
- The tugboats are used to pull the LNGC from the Terminal in a way that the tugboats manoeuvre the LNGC into a position parallel to the FSRU heading at about 70 meters off (70 meters from the FSRU).
- At a safe distance from the Terminal, and by using the main ship thruster and rudder, the LNGC moves forward and is set to an appropriate departing angle.
- Under favourable conditions tugboats can be released 1 NM distance of the LNGC from the Terminal.
- When the LNGC is safely clear of the Terminal, it needs to use its own propulsion by moving (at slow ahead speed) ahead from the position of the Terminal.

**The recommended unmooring sequence will be aligned between Master of the LNGC and Pilot after alignment with Master of the FSRU. 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 TUO-1-2 shall be repealed.

Managing Director

  
**LNG HRVATSKA**  
 d.o.o. za poslovanje ukapljenim  
 prirodnim plinom  
 ZAGREB, Slavonska avenija 1B  
 OIB: 53902625891

