

	Company:	LNG Croatia LLC (LNG Hrvatska d.o.o.) Radnička cesta 80, Zagreb, Croatia	Version/Revision 2/0	
	Facility:	LNG Terminal	Document number: TUO-25-2	
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Ship-To-Truck Terminal Technical Characteristics

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DEFINITIONS

Term	Meaning
ADR	European treaty regarding dangerous goods which contains regulations for traffic regarding packaging, securing of loads, and labelling of dangerous goods.
Adverse Weather Conditions	Conditions which, according to the Port Regulation or according to an order of the responsible person delay or prevent the Truck from entry at the Terminal, as specified below.
Agent	A legal entity registered for agency services performing the agency services in the name and for the benefit of the client concerning the arrival/departure of Trucks at the Port, including the required administration related to the cargo.
Boil-Off Gas	Gas evaporated from LNG in cargo tanks.
Cargo	LNG amount to be discharged from the FSRU vessel to Truck.
Croatian Regulation on handling of dangerous substances	Regulation on handling of dangerous substances, the conditions and manner of performing transport in maritime traffic, loading and unloading of dangerous substances, bulk and other cargo in ports, and the manner of preventing the spreading of spilled oil in ports.
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: <i>Golar LNG Ltd.</i>
Harbour Master Office	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 safety and issues documents and approvals for navigation, arrivals and departures from/to Croatian Ports.
LNG	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.
MSDS	Material Safety Data Sheet
Truck representative	Truck representative that is authorized to conduct activities on behalf of the Truck owner/operator, including the exchange of documentation with Terminal and Port Authority.
Port	Special Purpose Port - Industrial port LNG Terminal, Omišalj – Njivice LNG. IMO: HROMI-0003, position: LAT $45^{\circ}12'02.7''\text{N}$, LONG $14^{\circ}31'58.6''\text{E}$
Port Authority	Official Representatives of Special Purpose Port - Industrial port LNG Terminal, Omišalj – Njivice LNG.

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Port Regulation	Ordinance on order in Special Purpose Port - Industrial port LNG Terminal, Omišalj – Njivice and Regulation on determining the class and quantity of dangerous substances that may be handled in the Port, which may be carried by a ship or vehicle entering the Port area of the Special Purpose Port - Industrial port LNG Terminal, Omišalj – Njivice and the locations where such substances can be manipulated.
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.
STT Booklet	Ship-To-Truck Terminal Technical Conditions and Transfer Operations Procedures
Slot	A 4-hour period of time assigned to a Truck to arrive at the Terminal, load LNG and exit from the Terminal.
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.
Terminal Maintenance	Regular and extraordinary works, including works concerning the dry dock, required for safe and reliable Terminal operation during which the services of the Terminal are suspended, or their availability is limited.
Terminal Operator	Operator of the onshore part of the Terminal
Terminal Owner	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.
Truck	Special purpose Truck vehicle certified for transport of LNG.

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ABBREVIATIONS

Abbreviation	Meaning
ADR	The European Agreement concerning the International Carriage of Dangerous Goods by Road
BOG	Boil-off Gas
DHMZ	Croatian Meteorological and Hydrological Service
ESD	Emergency Shut Down
FSRU	Floating Storage & Regasification Unit
GIIGNL	International Group of Liquefied Natural Gas Importers
ISPS	International Ship and Port Facility Security code
LNG	Liquefied Natural Gas
MSDS	Material Safety Data sheet
PFSO	Port Facility Security Officer
POC	Point of Contact
ROO	Rules of operation of the Liquefied Natural Gas (LNG) Terminal
STT	Ship To Truck

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1. INTRODUCTION

The Ship-To-Truck Terminal Technical Characteristics represent a document which main purpose is to serve as general instruction for entry of Trucks into the area of Special Purpose Port - Industrial port LNG Terminal, Omišalj – Njivice (hereinafter: Port) and safe and efficient discharging operation of LNG from FSRU vessel to Truck.

Loading of LNG from FSRU vessel to Truck will be conducted at main Jetty platform using spray pump installed in cargo tanks of the FSRU vessel, via cryogenic hose connected from port liquid manifold to Truck. Only one loading operation at the time is allowed. Truck loading operations are not allowed when LNG Carrier is in the Port area. Also, Truck entrance into the Port area is not allowed while another vehicle is present on the Jetty.

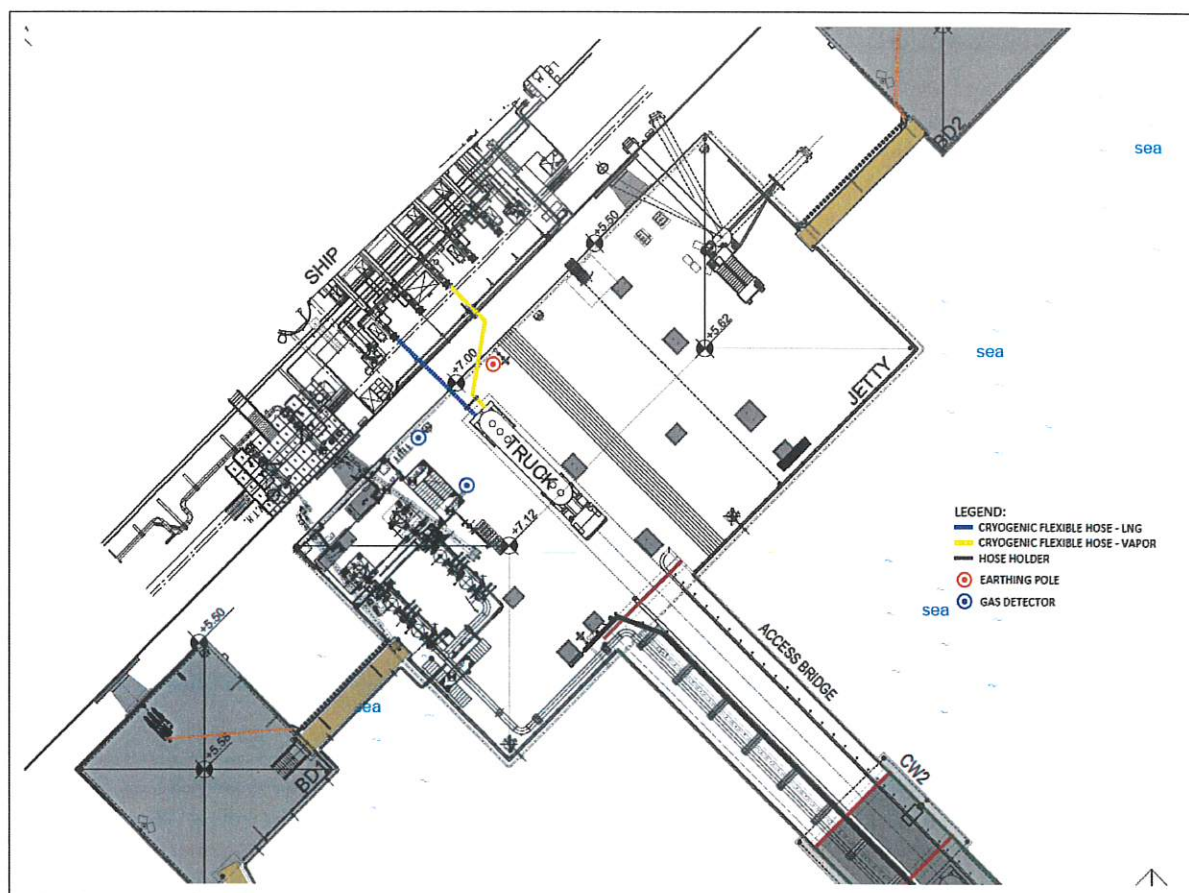


Figure 1.1 Ship-To-Truck visualization

Terminal Technical Characteristics is prepared in line with STT Booklet, Rules of operation of the Liquefied Natural Gas Terminal (hereinafter: ROO), Port Acts and applicable laws and regulations of the Republic of Croatia.

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Terminal Technical Characteristics also adopted recommendations coming from LNG industry forums and guidelines, such as:

- International Group of Liquefied Natural Gas Importers (hereinafter: GIIGNL)
- Society of International Gas Tanker and Terminal Operators (hereinafter: SIGTTO)
- International Safety Guide for Oil Tankers and Terminals (hereinafter: ISGOTT)

The STT Terminal Technical Characteristics is ownership of LNG Croatia LLC (LNG Hrvatska d.o.o.), which has control and is responsible for changes made to the STT Terminal Technical Characteristics. The latest version of the document is the relevant one.

Services and other assistance of any kind whatsoever provided to Truck calling/arriving at the Port/Terminal shall be provided subject to all applicable laws and regulations. Only Trucks which have successfully passed the overall approval process as defined further in this STT Terminal Technical Characteristics will be accepted and can enter the Port/Terminal, approach to the FSRU and load LNG from FSRU vessel.

PURPOSE AND SCOPE OF THE DOCUMENT

Purpose and scope of this document is to generally presents Ship to Truck LNG Transfer Operations within LNG Terminal Krk and procedures to be adopted during Ship to Truck LNG Transfer Operations.

The major steps are:

- Approval procedure,
- Adverse weather limit at the Port and Terminal,
- Communication and notification,
- Truck arrival at the Port/Terminal,
- Truck parking and preparing for LNG loading,
- Pre-transfer meeting documentation exchange process description,
- Loading,
- Exit,
- Emergency procedures,
- Rules and guidance for safe and efficient operation.

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2. BASIC TECHNICAL CHARACTERISTICS OF THE PORT AND TERMINAL

The Port and Terminal are located on the Island of Krk, Republic of Croatia.

Port

In the Port area the provisions of the ISPS Regulations, Regulation (EC) No 725/2004 and the Act on the Security of Maritime Ships and Port Areas with all their subsequent amendments as well as the provisions of the Port Facility Security Plan must be applied. All the persons present in the Port shall act according to the instruction of the PFSO in accordance with the Port Facility Security Plan and the Security level applied in the Port. Port and Terminal Exclusion area are under the video surveillance permanently watched by Security personnel, FSRU Crew and Terminal personnel.

Terminal

Terminal is owned and operated by LNG Croatia LLC (LNG Hrvatska d.o.o.). The FSRU, as integral part of the Terminal, is owned by LNG Croatia LLC and operated by FSRU O&M provider. The Terminal is operated in accordance with all relevant international standards and legislations and laws and regulations of Republic of Croatia, guidelines, and requirements, including the requirements arising from the ROO.



Figure 2. 1. LNG Terminal Krk

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Table 2. 1. Main technical characteristics of the FSRU vessel

FSRU general information	
International Maritime Organization (hereinafter: IMO) number	9256767
Name	LNG Croatia
MMSI	538006747
Current FSRU port of registry	Majuro
Current FSRU Flag state	Marshall Islands
Current FSRU vessel classification society	DNV GL
Length overall (in m)	280.17
Width moulded (in m)	43
LNG transfer (loading/reloading) system information	
Maximum LNG reloading capacity to Truck (in m ³ /hr)	40
Type of LNG loading/reloading cargo transfer system	Flexible hoses

Table 2. 2. Additional important information

Other important information		
Port and Terminal Location	Croatia, Island Krk, Omišalj Municipality, Poje 10	
Current Terminal time zone	Summertime	Wintertime
	UTC (+2) CEST	UTC (+1) CEWT

Table 2. 3. Truck conditions requirements

Truck requirements	
Cargo tank temperature (in °C)	not warmer than minus (-) 50
Maximum cargo tanks pressure (in barg) - before loading	3.0
Maximum gross weight (in tons) – after loading	40
Width over all Max (in m)	2.6
Coupling Options (CryoDC units or threaded connection need to be installed on Truck before arrival)	LNG: 2,5” CryoDC male Tank Unit ANSI 150 Flange BOG: 1,5” CryoDC male Tank Unit ANSI 150 Flange LNG: male coupling DN65 PN40 LNG, Tr 104 x 8-LH BOG: male coupling DN40 PN40 LNG, Tr 69 x 8-LH
High Level Alarm	must be equipped with High Level Alarm

The Cargo Tank must meet the following conditions, otherwise the loading operation may be refused by the Terminal:

- Be under natural gas or nitrogen atmosphere (the Terminal reserves the right to carry out checks),
- Not warmer than minus (-) 50 °C (unless it has scheduled a Cooling Down) in cryogenic conditions.

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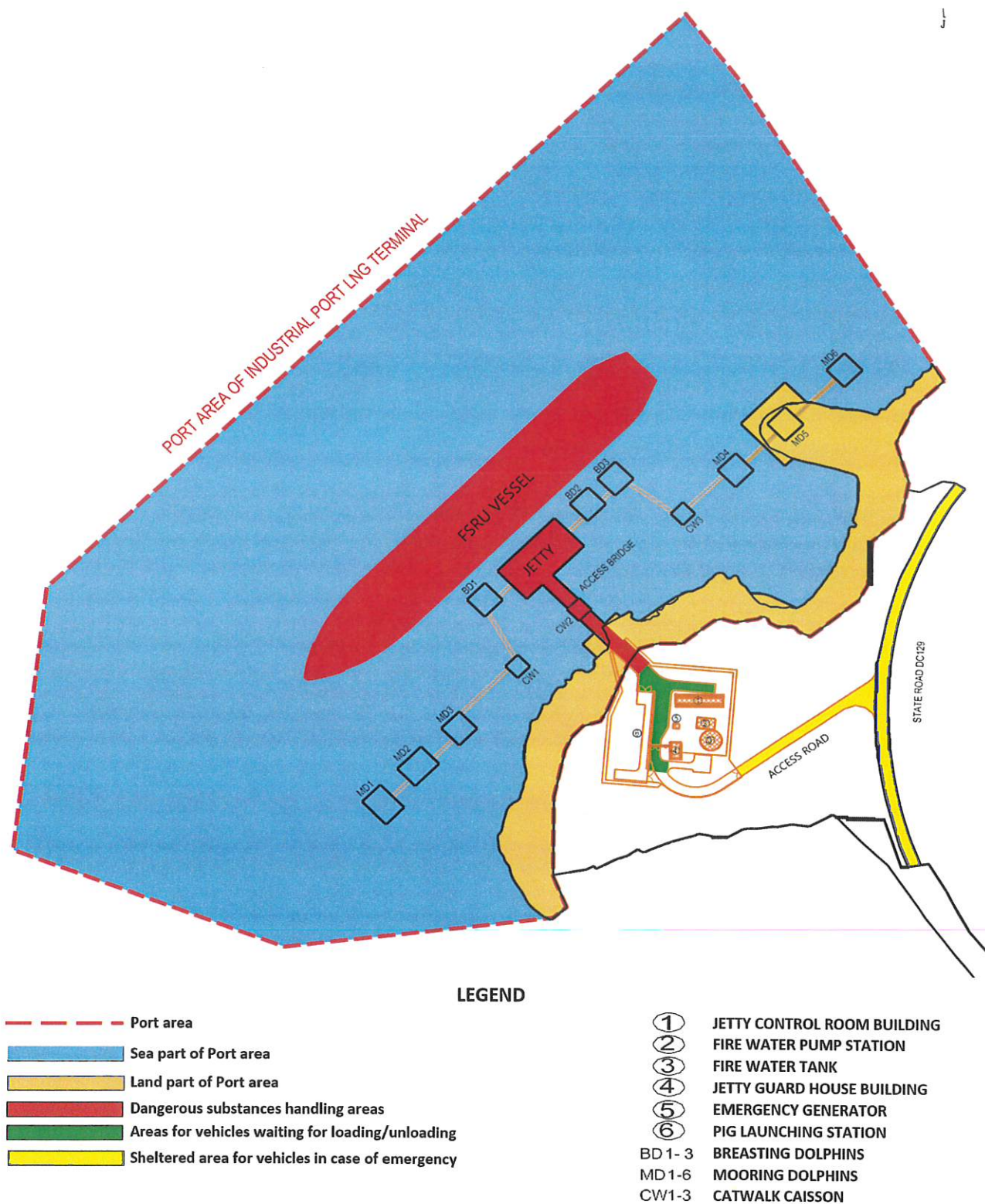


Figure 2.2. Dangerous substances handling areas

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3. ADVERSE WEATHER LIMIT AT THE PORT AND TERMINAL

Adverse weather conditions are conditions which, according to the Port Regulation or according to an order of the Port Authority or order of the Harbour Master Office, delay or prevent the Truck to enter the Port and at the Terminal or based on which the FSRU Master and/or Truck representative estimate that it is not safe to start/proceed with LNG loading activities.

Prior Truck calling the Port and during Truck's stay at Terminal, Truck Driver and FSRU's vessel Master, as well as Port Authority, must monitor weather reports and forecasts from Croatian Meteorological and Hydrological Service.

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.

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, FSRU and Truck representative.

Ship to truck operation will be carried out only during acceptable weather condition. The Port Authority will deliver an updated weather report from Terminal environmental monitoring in case weather is expecting to get worse, and such update will be delivered immediately upon such weather worsening is identified.

Boundary Limitations

Boundary Limitations for entering of the Truck into the Port and Terminal area and loading operations are as follows:

- Max wind speed 25.0 knots (mean),
- Max sea state 0.5 Hs (m),
- Max swell 0.5 Hs (m),
- Max surface current 1.5 (knots),
- Mooring failure or tension alarms for more than 12 minutes,
- Lighting in vicinity/ approaching of the lightning storm.

When boundary limitation has been reached, loading operations should be stopped, cargo hoses disconnected, and Truck should leave Terminal and Port area.

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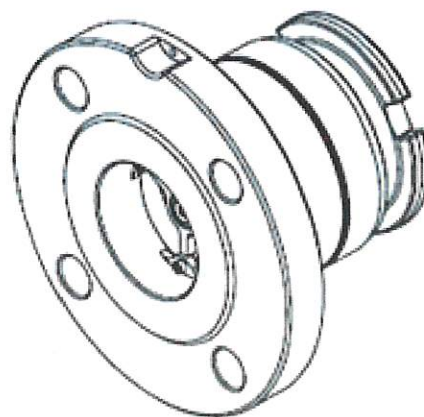
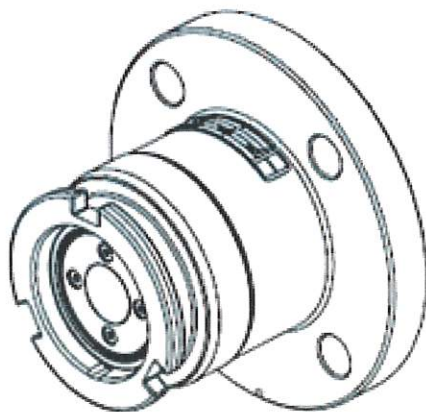
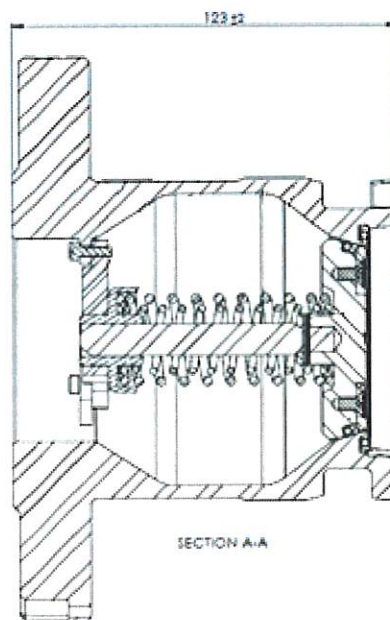
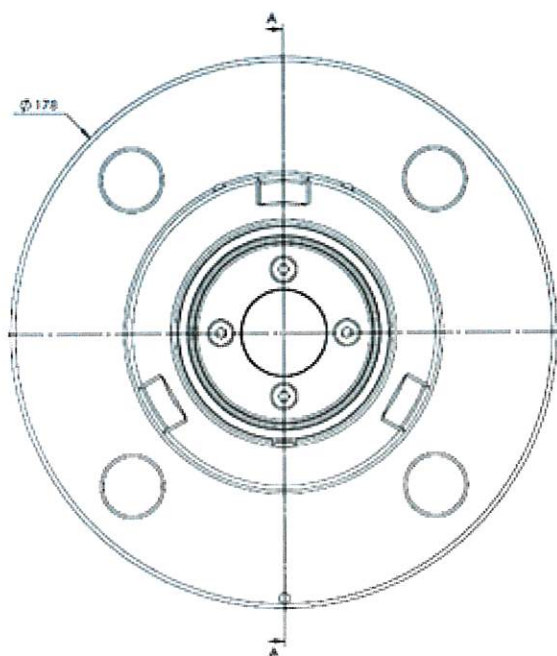
FSRU Master and/or Truck Driver and/or Terminal representative can decide about termination of loading operations, disconnection of cargo transfer hoses, and leaving the Truck from the Terminal and Port area in any moment, if they estimate that safety of their respective facility (FSRU vessel, Truck, Terminal) is endangered. The Port Authority shall be promptly informed about the decision, which will forward the decision to the Harbour Master's Office – both need to give the permission for leaving the Truck from the Terminal and Port area.

Upon entry into force of this version of the document, its previous version TUO-25-1 shall be repealed.

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Coupling on Truck (LNG line)

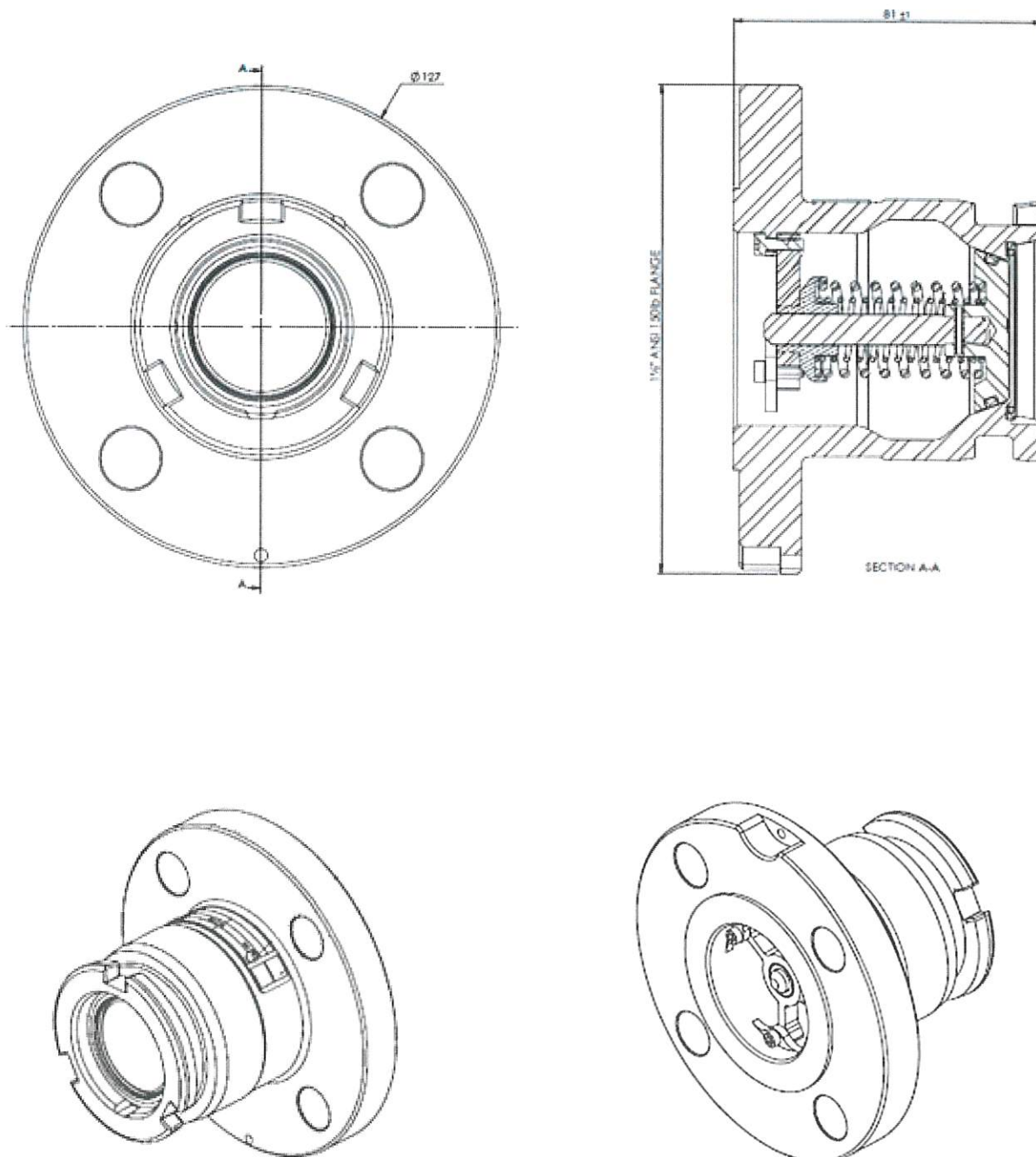
Example of 2.5" Cryo DC male Tank Unit ANSI 150 Flange



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Coupling on Truck (Vapour line)

Example of 1.5" Cryo DC male Tank Unit ANSI 150 Flange



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Example of coupling connection (hose unit + tank unit that needs to be installed on Truck before arrival)

1)



2)



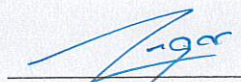
3)



4)



Director of Operations and Technical Affairs Division


Ivan Fugaš

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