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INTRODUCTION

1. PURPOSE:

Providing relevant information and establishing the criteria and conditions to promote safe and efficient marine operations regarding the transfer and regasification of liquefied natural gas (LNG) in the SPEC LNG Terminal – Sociedad Portuaria El Cayao Terminal.

2. SCOPE:

This Manual brings together the best practices in the industry and existing regulations regarding safe operations in LNG terminals and vessels and it is intended to provide users of the SPEC LNG Terminal and technical personnel procedures to conduct activities without accidents involving human life or environmental contamination.

3. DEFINITIONS:

In this Manual, the following words and expressions shall have the meaning ascribed thereto:

- **Shipping Agent:** a shipping agent is the person that represents the ship-owner onshore for all purposes related to the vessel.

- **Shipping Agency**: refers to the company that represents the ship-owner ashore, which has been appointed to act on the ship owner's behalf with local authorities and the Terminal for all purposes related to the vessel.

- **Vessel owner:** refers to the natural or legal person who prepares, equips and ships the vessel on its own behalf, receives the profits produced by the vessel and assumes the responsibilities regarding the vessel. The vessel owner may or may not own the vessel.

- **National Maritime Authority**: General Maritime Authority (DIMAR, by its Spanish acronym).

- **Unloading vessel**: refers to the vessel from which the LNG is transferred.

- **Master:** refers to the master of a LNG carrier or to a FRSU, depending on the context.

- **Notice of Readiness (NOR**): refers to the document that informs the Company that the LNG carrier has arrived to the Practical Pilot Waiting Area of the Port of Cartagena de Indias and that it is ready to start unloading once it has arrived to the terminal. The NOR shall be sent via e-mail or any other mutually agreed channel and shall be signed by the Master of the LNG carrier, indicating date and time of issuance. It must be addressed to the Person in Charge designated by the SPEC LNG Terminal. The notice must be issued once the LNG carrier receives Free Circulation by the Port Authorities of Cartagena.

- **Authorized Equipment**: refers to equipment that has been approved and certified by a competent authority, such as a classification company or the maritime authorities.

- **FRSU**: Floating Storage Regasification Unit.

- **Plant or Terminal Manager**: refers to the person in charge of the operation of the Terminal.

- **Inert Gas**: refers to a gas (such as nitrogen) or a mix of escaping gases, which do not contain enough oxygen to cause hydrocarbon combustion.

- **Shift Supervisor:** refers to the person designated by the SPEC LNG Terminal as the person in charge of connecting and disconnecting the unloading arms and of supervising all the unloading operations of the LNG carriers.

- **Free Circulation**: in general terms, refers to the authorization issued by the Maritime Authority to allow access of people to the vessel in order to disembark its passengers and crew and start loading or unloading procedures.

- **Operation Manual of the Terminal or Manual**: refers to this manual which comprises the corresponding Agreements on the USE of the LNG Terminal made between the Company and its Clients.

- **Ship-to-Ship Transfer (STS)**: refers to the operation by which LNG is transferred between vessels positioned and moored alongside each other. It includes approaching, mooring, hose connection, safe transfer procedures, hose disconnection, unmooring and departure.

- **Arm Operator:** refers to the person in charge of connecting the arms to start the unloading operation.

- **Port Facilities Security Officer (PFSO)**: refers to the person who has been designated to be in charge of the coordination and application of the ISPS code in the port facilities of the Terminal.

- **Ship Security Officer (SSO):** refers to the person onboard the vessel who has been designated to be in charge of the coordination and application of the ISPS Code.

- **Person in charge of Maritime Operations**: Refers to the person in charge of the maritime operations of the LNG Terminal, who will carry out POAC duties and who will be responsible for the operation and for verifying the certificates that grant the LNG vessel the compatibility and suitability to provide its service. He/she will track the evolution of the LNG vessel since its arrival to the port and will oversee the safety of the vessel during its stay and the mooring and departure procedures, act during emergency situations and coordinate the communication between the Terminal, the LNG vessel and the Port Authorities.

- **SPEC LNG Terminal**: Spanish acronym for El Cayao Port Company.

- **Hot Work**: work involving a combustion source or temperatures high enough to produce the combustion of a flammable gas mixture. This includes any work requiring the use of welding, heating or welding equipment, cutting torches, electrical tools, portable electrical equipment that is not intrinsically safe or that is not contained in an explosion-proof box.

4. OVERVIEW OF THE TERMINAL:

The SPEC LNG Terminal is a port facility intended for the use, operation and management of a terminal to import liquefied natural gas (LNG).

Natural gas will be received in its liquid state and it will be converted to gaseous stated through a regasification plant.

The Liquefied Natural Gas Regasification Plant includes offshore and onshore facilities to receive, store and re-gasify LNG and to carry the natural gas to the point of connection with

the National Transportation System (NTS), see Figure 1.

Figure 1. General View

The terminal has the necessary facilities to process liquefied natural gas (LNG) through a regasification plant located on a Floating Storage Regasification Unit and to transport the gas through a marine/terrestrial pipeline to Mamonal station, the National Gas Transportation System (SNT, by its Spanish acronym).

During operation at the facilities, the FSRU, which will be permanently docked, will receive LNG from LGN carriers (LNGC) through cryogenic hoses using Ship-to-Ship (STS) configuration and will store the LNG in LNG tanks to later perform the vaporization process. See Figure 2.

Figure 2. General Layout of the Terminal

The FSRU will be connected to the high-pressure gas pipeline –which will be located on the walkway to access the deck– through a high-pressure unloading arm located on the deck platform, in order to send the gas to onshore facilities.

Once the high-pressure gas pipeline reaches the onshore area of the project, it will go underground up to natural gas metering station.

This is the starting point of the gas pipeline connecting the LNG terminal with the National Transport System, which will reach Mamonal industrial zone.

The components of this phase are:

- Floating Storage and Regasification Unit (FSRU).
- A pier including a docking platform, a walkway for pedestrian access and the gas pipeline over the walkway.
- Onshore facilities that include the onshore pipeline, the gas measuring station and other auxiliary services.
- The pipeline connecting with the National Transport System (SNT).

A maneuverability study made by SPEC classified different types of LNG carriers that could arrive at the SPEC LNG Terminal without compromising their navigation until reaching the side of the FSRU.

LNG VESSEL	CAPACITY (M^3)	LENGTH OVERALL (METERS)	BEAM (METERS)	MAXIMUM DRAFT (METERS)	DWT
1	266,000	345	54	13	130,000
2	150,000	284	44	12	74,590
3	135,000	276	45	11	67,131
4	70,000	239	37	9	34,809
5	22,000	140	27	7	10,940

Table 1 Classification of LNG carriers.

Floating Storage and Regasification Unit (FSRU)

An FSRU is a vessel similar to conventional LNG carriers, built and certified to operate in stationary form as a unit of reception, storage and regasification of LNG. It is a new generation vessel designed according to the DNV-GL requirements (Ship Class Requirements), based on a flexible maintenance solution which allows to perform renewal survey at site.

It is equipped with GTT Mark III tanks made of a reinforced membrane surrounded by ballasts tanks with double bottom and double side structure. Its total storage volume is 170,000 m^3, distributed among four (4) cargo tanks.
Its general characteristics are described in Table 2, which shows the features of a membrane-type FSRU with a capacity of 173,400 m^3.

CHARACTERISTICS	VALUE
Gross LNG storage capacity	170,000 m^3
Length overall (LOA)	294 m
Length between perpendiculars (LBP)	282 m
Beam (Width)	46 m
Molded depth	26 m
Design draft	11.6 m
Ballast draft (Meters)	9.3

Design draft	11.6 m
Full-load displacement draft	116.973 Tons

Table 2 General Characteristics of the FSRU.

LNG will be stored in tanks at atmospheric pressure and at about temperature of -162° C, and will be heated and vaporized on the basis of onshore demand. A double-shell reinforced insulation system protects the load from exposure to heat exchange with the environment and reduces the rate of evaporation of the liquid.

The regasification unit located on the FSRU has a capacity of 400 MMSCFD regasification (N+1). In addition, it has a system for handling the "Boil Off Gas" (BOG) generated in the process as well as all the auxiliary systems required.

Off-Shore Facilities.

The terminal will receive LNG carriers with a capacity up to 170,000 m3 and a maximum draft of 12 meters and will have a quayside depth of 19 meters. The functional requirements of the Port Terminal include the following structures:

Unloading Platform.

Berthing and Mooring Dolphins.

A 700-meters-long walkway for pedestrian access, connecting the onshore facilities with the unloading platform and industrial nautical equipment.

A high-pressure gas pipeline will go above the walkway.

A simulation study made by the SPEC LNG Terminal assessed the exact information to determine which type of vessels could access the terminal without risking the LNG carrier and the FSRU. Some types of LNG were classified, along with the FSRU, resulting in the data shown in Table 3.

Vessel	LNG Carrier 145K m3	FSRU	LNG Carrier 173K m3	LNG Carrier Qmax
Type	Moss	Membrane	Membrane	Membrane
Capacity [m3]	145K	173.4K	173.4K	266K
Displacement [tonnes]	102,400	114,830	114,830	178,500
LOA [m]	289.50	299.90	299.90	345.00
LPP [m]	277.00	288.00	288.00	332.00
Beam [m]	49.00	45.80	45.80	53.80
Loaded Draught [m]	11.40	11.50	11.50	12.00
Ballast Draught [m]	9.40	9.94	9.94	9.60
Ship Model. Ballast	***3313***	***3535***	***3535***	***3532***
Ship Model. Loaded	***3314***	***3536***	***3536***	***3533***

Table 3 Types of vessels that can access the SPEC LNG Terminal

Mooring and Fendering Systems

The SPEC's mooring systems consists of the following elements:

- Six (6) Mooring Dolphins (MD1, MD2, MD3, MD4, MD5, MD6)
- Four (4) Berthing Dolphins (BD1, BD2, BD3, BD4)
- Six (6) Triple Quick Release Hooks (QRH) with an SWL (Safe Working Load) of 150, each one positioned in each mooring dolphin.
- Four (4) Double Quick Release Hooks (QRH) with a resistance of 150 tons, each one positioned in each berthing dolphin.
- Four (4) fenders for berthing the FSRU.

- No mooring buoys

- Mooring line tension monitoring system

- Meteo-marine and vessel approach monitoring system

Mooring Dolphins

Six (6) concrete structures with a working platform that has a width of 80cm and an area of 7 x 6m, in order to ensure the safety of the mooring staff. Its top is 8 meters above mean sea level.

The triple quick release hooks are located in the mooring dolphins, where the bow (MD1, MD2, MD3) and stern (MD4, MD5, MD6) morring lines are secured. The mooring dolphins are located as follows: three on each side of the dock central platform, after the berthing dolphins and 33 meters towards the shore starting at the the external lines of the berthing and mooring dolphins respectively.

Berthing Dolphins

Four (4) concrete structures with a working platform that has a width of 80cm and an area of 7 x 6m, in order to ensure the safety of the mooring staff. Its top is 8 meters above mean sea level.

These platforms are supported by 8 inclined steel piles with a diameter of 1.219m and a width of 2.5.

The double quick release hooks are located in the berthing dolphins, where the vessel's bow (BD1, BD2) and stern (BD4, BD3) springs mooring lines are secured.

The berthing dolphins are located as follows: two on each side of the pier central platform (Loading/Unloading Platform). The separation between most inner dolphins (BD2 and BD3) is 49.4m, while the separation between the most outer dolphins (BD1 and BD4) is 110m.

Quick Release Hooks

These are mooring hooks that, as their name implies, allow the rapid release of the morring lines holding the ship to its dock, optimizing the morring lines release in each sailing maneuver and, more importantly, in cases of emergency. They also reduce the efforts and physical stress of the mooring staff, positively impacting workplace ergonomics.

Each triple hook is anchored to the mooring dolphin platform and each double hook is

anchored to the berthing dolphin platform.
Quick release hooks have a SWL of 150 metric tons.

Mooring line tension monitoring system

An equipment which monitors the tension of each mooring line and activates an alarm when critical values are reached.

Meteo-marine and vessel approach monitoring system

A system that allows monitoring the lateral speed of the vessel approaching the dock, both at the bow and the stern, as well as wind speed, wave height, atmospheric pressure and ambient temperature.

Fenders

Flat rectangular fenders with an area of 3.5 x 3.5 meters, an elevation of 6.3 meters above mean sea level, measured at the center point of the fender, will be used, ensuring that the maximum pressure against the ship's hull is 21.7 psi.

Fenders are designed to absorb a pressure of 133.9 tons for a vessel with a lateral contact speed of 0.16, with a pressure deflection of 52.5% (about 1 meter) for 178.10 tons. [1]

The following table shows the recommended approach speeds according to vessel size and considering the design of the fenders.

REFERENCE VESSEL	CAPACITY [m^3]	LENGHT [Meters]	DWT	Lateral Contact Speed (maximum)	
				m/sec	Knots
1	266,000	345	130,000	0.10	0.20
2	150,000	284	74,590	0.14	0.28
3	135,000	276	67,131	0.15	0.30
4	70,000	239	34,809	0.19	0.38
5	22,000	140	10,940	0.29	0.58

[1] "Moored Vessel Basic Study". #DD54602A-MAR-RP-003. Foster Wheeler, Proes, Y&V. 2013

Table 4 Lateral Contact Speed

The mooring and fendering system of the Terminal is designed to allow safe maneuverability of all types of LNG carries to be loaded or unloaded on the SPEC LNG Terminal.

There exist mooring hooks that revolve around fixed points and equipped with a quick release mechanism, which must be operated at the Terminal following the instructions of the vessel's Captain. The mooring procedures for the FSRU and the LNGC must comply with the standards regulating these types of operations.

5. PROCEDURE AND CONDITIONS FOR MOORING THE FSRU AND THE LNG CARRIER

General

An inspection shall be made 48h before the arrival of the LNG carrier. The purpose of such inspection is to visually confirm that the mooring lines and arrangements for cargo transfer are ready to receive the LNG Carrier.

The Captain is responsible for keeping his LNG Carrier safely moored at all times. The dock has a mooring line tension monitoring system that can be observed from the FSRU's central control room and the dock's control room.

Berthing shall be carried out with the support of two azimuth tugboats with a 60 ton bollard pull each.

The following configuration[2] (Figure 3) must be considered when mooring the FSRU. (Capital letters indicate the location of the mooring lines in Figure 3).

Forward	Astern
3 ropes (J)	3 ropes (A)
2 ropes (I)	2 ropes (B)

[2] Optimoor Mooring Study FSRU "HÖEGH GRACE" (Abril 24/2015)-

3 ropes (H)	3 ropes (C)
2 ropes (G)	2 ropes (D)

Table 5 Distribution of Mooring Lines

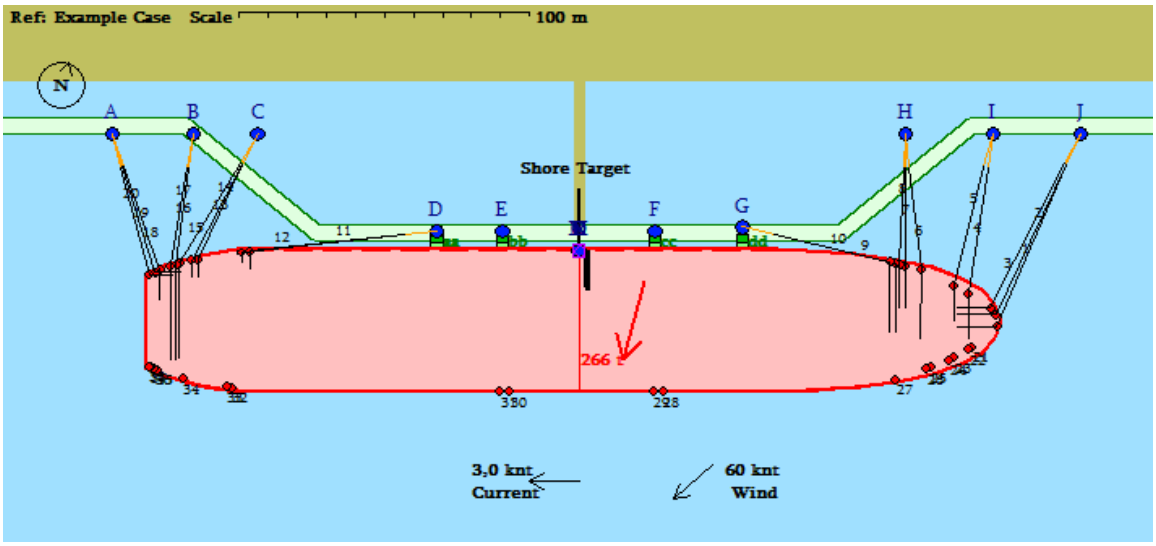

Figure 3. Mooring Configuration of LNG Carrier / FSRU

Dock mooring operations must be coordinated with the Captain of the FSRU and the onshore operations supervisors, in order to ensure that each line is sequentially managed and guaranteeing a safe and efficient operation.

The sequence and number of lines are agreed upon by the Captain of the Carrier and the Practical Pilot.

When mooring operations are carried out between the LNG Carrier and the FSRU, all the lines of the LNG Carrier must be moored to the FSRU (Figure 4), under STS procedures and standards.

Mooring lines must be organized and distributed in such a way that both ships are properly moored next to each other.

The mooring lines of the LNG Carrier are the ones used to moor it to the FSRU, i.e. the lines are sent from the LNG Carrier.

The mooring plan adopted will depend on the size of each carrier, the size difference between the FSRU and the LNG Carrier, the estimated freeboard and displacement difference between both ships, expected water and wind conditions and the degree of refuge expected form the location at the SPEC LNG Terminal (Figure 4).

It is important to guarantee that the mooring lines allow the minimal movement between both ships, e.g. when there are freeboard changes.

A good practice for mooring ships for STS operations is to have the mooring lines located on the same direction made of a similar material.

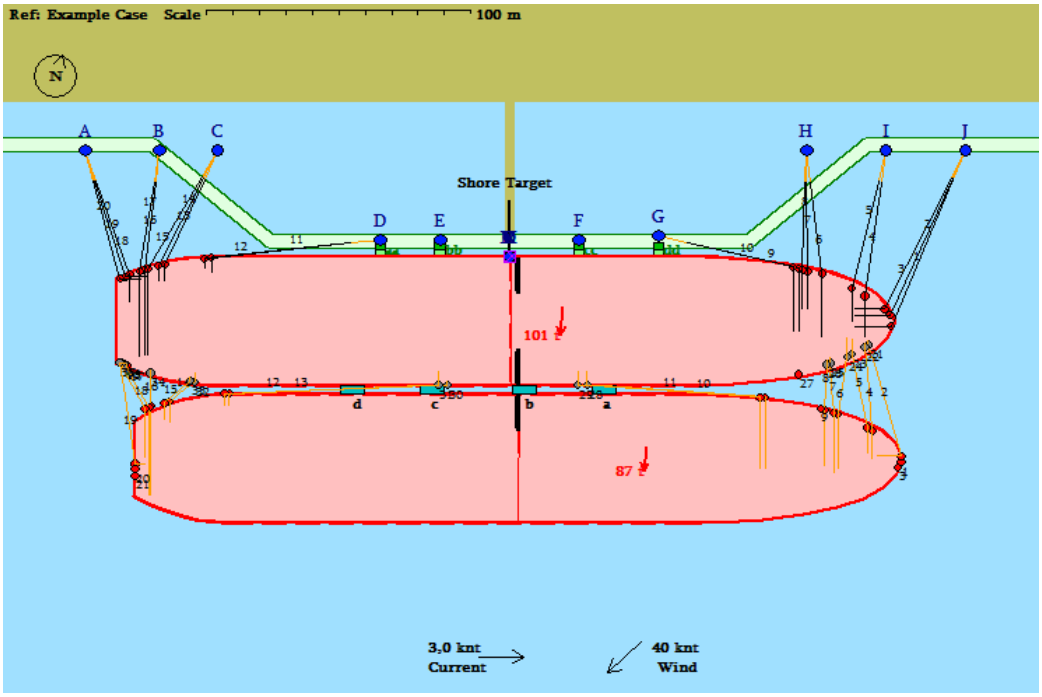

Figure 4. Mooring configuration – LNG Carrier to FSRU

The LNG Carrier must have additional available lines, in case there is a need to reinforce the moorings due to extreme weather conditions or in case one of the lines fails.

It is normal that the mooring lines are sent from the maneuver vessel. However, reinforcement lines can also be sent from the FSRU due to prevailing weather or meteorological conditions.

The sequence and number of lines between the FSRU and the LNG Carrier next to it are agreed upon by the LGNC's Captain, the FSRU's Captain and the Practical Pilot, according to the previously agreed mooring sequence.

Mooring Lines Monitoring

There is a control system to measure the traction forces of the mooring lines which sends such information to the carrier and the Terminal.

Each mooring hook has dynamometric cells to measure the traction of each mooring line.

6. GEOGRAPHIC LOCATION:

The Terminal is located in Colombia, South America, on the shores of the Caribbean Sea, in the Inner Bay of Cartagena de Indias, on the southwest side of the Bay of Cartagena, on the following geographic coordinates: Latitude 10º 16’ 29.01” N and Longitude 75º 33’ 14.55” O, on the left side of Canal del Dique, approximately 3.3 km straight over the coast (See Figure 5).

Figure 5 Terminal Location

7. GENERAL INFORMATION – ARRIVAL TO THE SPEC LNG TERMINAL

The access channel to arrive to the Terminal is appropriately signaled, meeting all IALA requirements. The LNG Carrier access the Inner Bay of the Port of Cartagena through a one-way public channel and later must turn to starboard to take the access channel that takes it to the SPEC LNG Terminal, as shown in Figure 6.

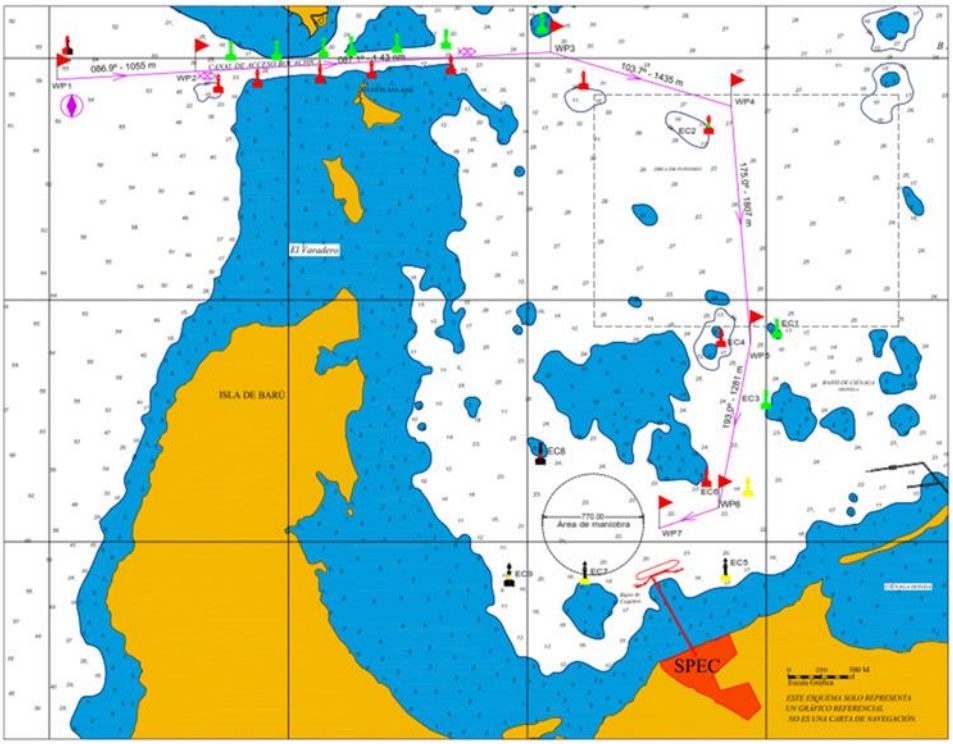

Figure 6 General Information – Arrival to the SPEC LNG Terminal

Specific signaling information is available in the Port of Cartagena entry card.

This section, or subsequent sections here should contain the following information;

- Manoeuvring challenges in the approach to the SPEC LNG Terminal, starting from outside the Bocachica channel.
- Underwater environment.
- Restrictions for passing through the Bocachica channel, as given in the Operational Limits document should be included here, or referred to.
- LNGC anchorage area and manoeuvring area should be indicated in the charts (Fig 6),

and described here, or if described elsewhere in this document a reference to the relevant section should be included.

Communication:

Language

The language used in communication will be English. The use of another language, for example Spanish (as a second language), must be agreed in advance to ensure proper communication between the parties.

Messages previous to arrival:

Once the LNG load is finished, the Terminal Operator will be notified of the origin, quality and quantity of the shipment through Certificates of Quantity and Quality sent via e-mail from the port of origin.

When the Carrier departs from the port of loading, the Terminal Operator shall receive the following information via e-mail:

- Date and time of departure
- Estimated Time of Arrival (E.T.A.) to the port of discharge
- Departure Draft
- Additional special requirements if determined by the Captain

A first notification must be sent at the time of departure of the LNG Carrier from the point of departure, which shall include:

AA Name of the LNG Carrier and distinctive sign
BB Date and time of loading and departure
CC Estimated Time of Arrival (ETA)
DD Amount of LNG loaded (in m3) on board the LNG Carrier
EE Any operational deficiency that might affect the performance of the LNG Carrier at the Terminal or Port of Arrival
FF Density from CTS at load port

Notification during navigation between departure and arrival

While the Carrier is navigating, reasonable efforts must be made to send daily notifications at 12 PM with the following information:

AA Name of the LNG Carrier and distinctive sign
BB Ship Position (Latitude and Longitude)
CC Estimated Time of Arrival (ETA)
DD Liquid temperature and pressure of the loaded tanks

Second Notification: 96 hours before arrival

The LNG Carrier must send a second notification 96 hours before the ETA set out in the First Notification, establishing the ETA at this current moment.

AA Name of the LNG Carrier and distinctive sign

BB Updated ETA

If the ETA notified in BB changes by more than 6 hours and before the Third Notification is made, the LNG Carrier must notify the corrected ETA.

Third Notification: 72 hours before arrival

The LNG Carrier must send a third notification 72 hours before the ETA set out in the Second Notification (according to correction), establishing the ETA at this current moment.

AA Name of the LNG Carrier and distinctive sign
BB Updated ETA

If the ETA notified in BB changes by more than 6 hours and before the Fourth Notification is made, the LNG Carrier's Captain must notify the corrected ETA.

Fourth Notification: 48 hours before arrival

The LNG Carrier must send a fourth notification 48 hours before the ETA set out in the Third Notification (according to correction), establishing the ETA at this current moment.

AA Name of the LNG Carrier and distinctive sign
BB Updated ETA

If the ETA notified in BB changes by more than 6 hours and before the Fifth Notification is made, the LNG Carrier's Captain must notify the corrected ETA.

Fifth Notification: 36 hours before arrival

The LNG Carrier must send a fifth notification 36 hours before the ETA set out in the Fourth Notification (according to correction), establishing the ETA at this current moment.

AA Name of the LNG Carrier and distinctive sign
BB Updated ETA

If the ETA notified in BB changes by more than 6 hours and before the Sixth Notification is made, the LNG Carrier's Captain must notify the corrected ETA.

Sixth Notification: 24 hours before arrival

The LNG Carrier must send a sixth notification 24 hours before the ETA set out in the Fifth Notification (according to correction), establishing the ETA at this current moment.

AA Name of the LNG Carrier and distinctive sign
BB ETA confirmation
CC Estimated amount of LNG (in m3) to be discharged at the Terminal.
DD Liquid temperature and pressure update of the sensors of each LNG tank inside the LNG Carrier.

If the ETA notified in BB changes by more than 3 hours and before the Final Notification is made, the LNG Carrier's Captain must notify the corrected ETA.

Final Notification: 12 hours before arrival

The LNG Carrier must send a final notification 12 hours before the ETA set out in the Sixth Notification (according to correction), establishing the ETA at this current moment.

AA Name of the LNG Carrier and distinctive sign
BB ETA confirmation
CC Estimated amount of LNG (in m3) to be discharged at the Terminal.

DD Liquid temperature and pressure update of the sensors of each LNG tank inside the LNG Carrier.

Such information will be required by the SPEC LNG Terminal in order to define the discharge conditions and prepare the Terminal so the discharge is carried out under best conditions.

If the ETA notified in BB changes by more than 1 hour, the LNG Carrier's Captain must notify the corrected ETA.

Upon Arrival:

A NOR and a final report indicating the time of arrival of the LNG carrier must be sent together with the estimated quantity of LNG to be unloaded at the Terminal, its temperature, density and the pressure of each tank of the LNG Carrier. To the extent technically feasible, the Captain will make Reasonable Efforts to inform the SPEC LNG Terminal the bubble point and density of the LNG.

Once the LNG Carrier has arrived at the pilot station and is ready to start unloading, the Captain shall send the NOR by email to the Maritime Agency, copying all parties involved.

All operational changes made on board and/or at the SPEC the terminal that may affect unloading operations will be communicated by email or fax as soon as possible.

Pre-Arrival Communications:

The communication procedures shall include, without limitation, the following items:

a. Agreeing upon one single communication language between the crews of the vessels participating in the loading or unloading procedures.

b. Contact should be established through the appropriate VHF channel and then switch to work channel agreed. Approach, docking and undocking operations shall not start until adequate communication between all ships involved has been established.

c. Connection and disconnection procedures must be communicated to the Maritime Traffic Station via radio communication, indicating the time of

occurrence of each event.

d. During unloading procedures, crews in charge of vital positions on the vessels involved shall have common and reliable communication channels at all times, including backup equipment. Equipment and spare batteries shall be available.

e. If a communication failure occurs during loading operations, the previously coordinated alarm signal should be activated and all operations must be suspended immediately. Operations will not resume until communications have not been successfully restored.

8. CONTINGENCY PLAN DURING LNG TRANSFER OPERATIONS:

The SPEC LNG Terminal has established a contingency plan to address any emergency that may occur during LNG transfer operations.

Emergency Coordinator:

Refers to the person designated by the HSEQ Manager to be in charge of the safety of each operation and handling emergencies.

Responsibilities of the Emergency Coordinator:

- Knowing the established response procedures.
- Maintaining an updated inventory of the emergency equipment.
- Maintaining an inventory of auxiliary personnel and emergency suppliers.
- Ensuring execution of training programs.

In case of emergency, the Emergency Coordinator is in charge of:

- Make a preliminary assessment of the emergency.
- Activating the emergency brigade.
- Coordinating the logistics of the procedures included in the Contingency Plan.
- Providing the necessary equipment according to the Contingency Plan.
- Locating and providing auxiliary personnel and emergency suppliers.
- Developing procedures to restore operations.

- Cooperating during emergency research.

Emergency Chief / On-Site

Is the person designated to be in charge of all the "emergency operation" and at the forefront of the scene.The Emergency Chief reports to the Emergency Coordinator and must inform the development of the Contingency Plan and must also be in constant communication with the Technical, Operations and Logistics areas, according to the corresponding coordination systems to make their support flow throughout the process.

Responsibilities of the Emergency Chief:

- Knowing their responsibilities within the Contingency Plan.
- Maintaining an inventory of emergency equipment and materials.
- Verifying the participation of the brigades during the training process.
- Participate in drills and training.

In case of emergency, the Emergency Chief is in charge of:

- Activating the Contingency Plan according to the type of emergency.
- Programming supplies, according to the type of emergency.
- Organizing support service personnel.
- Coordinating transportation of required materials and equipment.
- Designating responsibilities to the Emergency Brigade.
- Presenting a report with available materials and equipment after the emergency.
- Evaluating the behavior of the Brigade to improve procedures.

Technical Coordination:

An officer from the technical division must be designated to be in charge of technical coordination in case of emergency. He/she knows the strategies and corporate directions of the emergency planning company.

Responsibilities of Technical Coordination:

- Knowing their responsibilities within the Contingency Plan.

- Defining the technical strategies for emergency control.
- Participating in drills and training.

In case of emergency, the Technical Coordination is in charge of:

- Managing the technical documentation to address emergencies.
- Managing environmental matters as well as sensitive resources and areas.
- Presenting reports to show the progress of contingency management.
- Presenting the company's internal reports.
- Presenting reports to local and environmental authorities.

Operational Coordination:

An officer from Operations must be designated to be in charge of operation coordination in case of emergency. He/she knows the operational activities to manage emergencies.

Responsibilities of Operational Coordination:

- Knowing their responsibilities within the Contingency Plan.
- Participating in drills and training.

In case of emergency, the Operational Coordination is in charge of:

- Suspending operations and coordinating control activities.
- Managing and coordinating restoring, monitoring and emergency control procedures.

Logistics Coordination:

An officer from Logistics must be designated to be in charge of logistics coordination in case of emergency. He/she knows the logistics activities to manage emergencies.

Responsibilities of Logistics Coordination:

- Knowing their responsibilities within the Contingency Plan.
- Participating in drills and training.

In case of emergency, the Logistics Coordination is in charge of:

- Managing the company's internal communications in order to rapidly enable logistics support.
- Managing and coordinating national and institutional services for rapid provision and mobilization of resources and support, such as agreements and/or conventions.
- Managing and coordinating personnel to engage in control activities.

Level of Emergency Response and Protection Priorities

Emergencies are classified in three (3) levels of response according to its significance, characteristics and magnitude:

LEVEL 1:

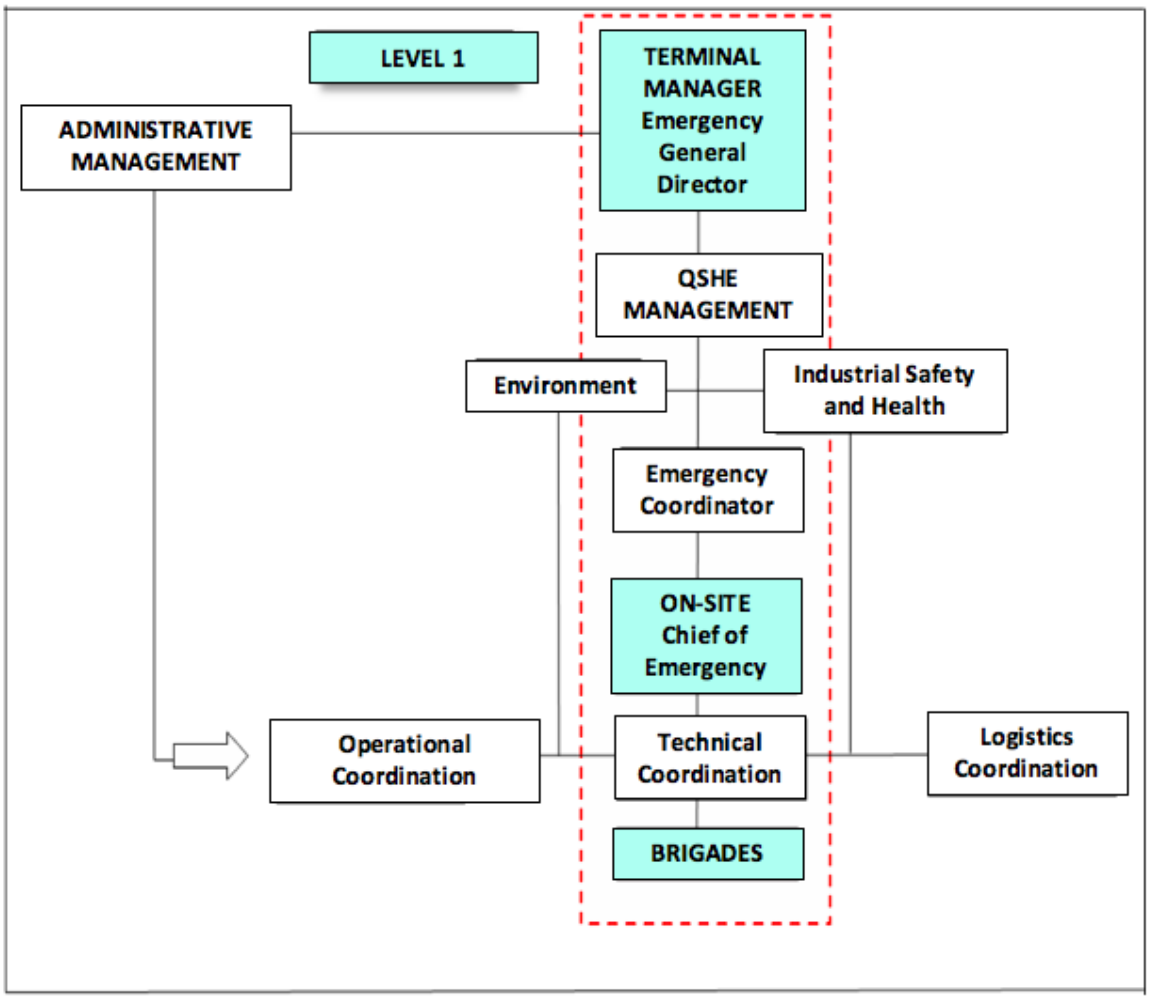

Figure 7 LEVEL 1 RESPONSE

These are emergencies that only affect one area of the operation and correspond to tolerable risks.

In such cases, the emergencies can be controlled with the resources and personnel of the area affected. Emergency functions or groups will be activated according to the criteria of the Emergency Chief.

LEVEL 2:

These are emergencies that have a wider scope than the operational area. Risk are still

tolerable.

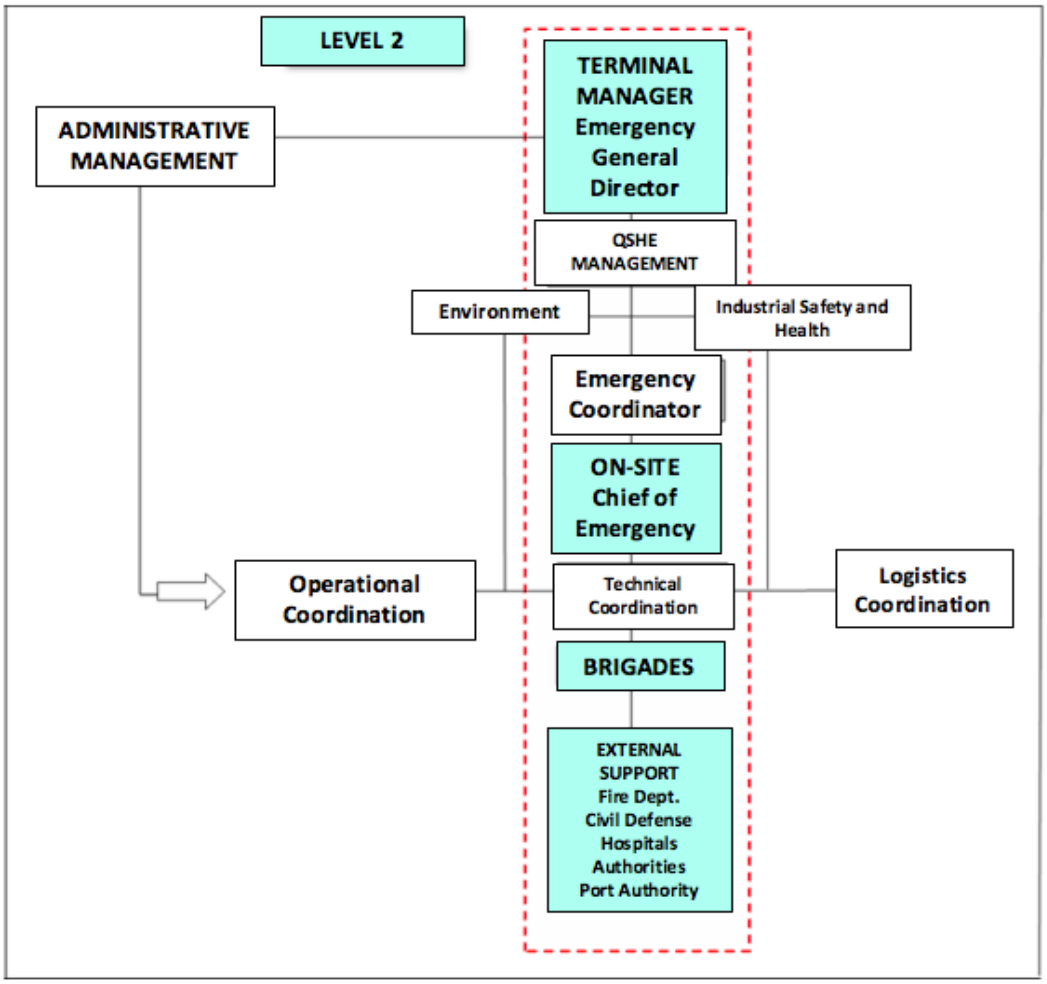

Figure 8 LEVEL 2 RESPONSE

In such cases, emergencies must be controlled with the support of internal resources and other external resources, which are partially activated. Regional entities must provide their support.

LEVEL 3:

These are large-magnitude emergencies whose risks are inadmissible. They pose environmental or contamination risks.

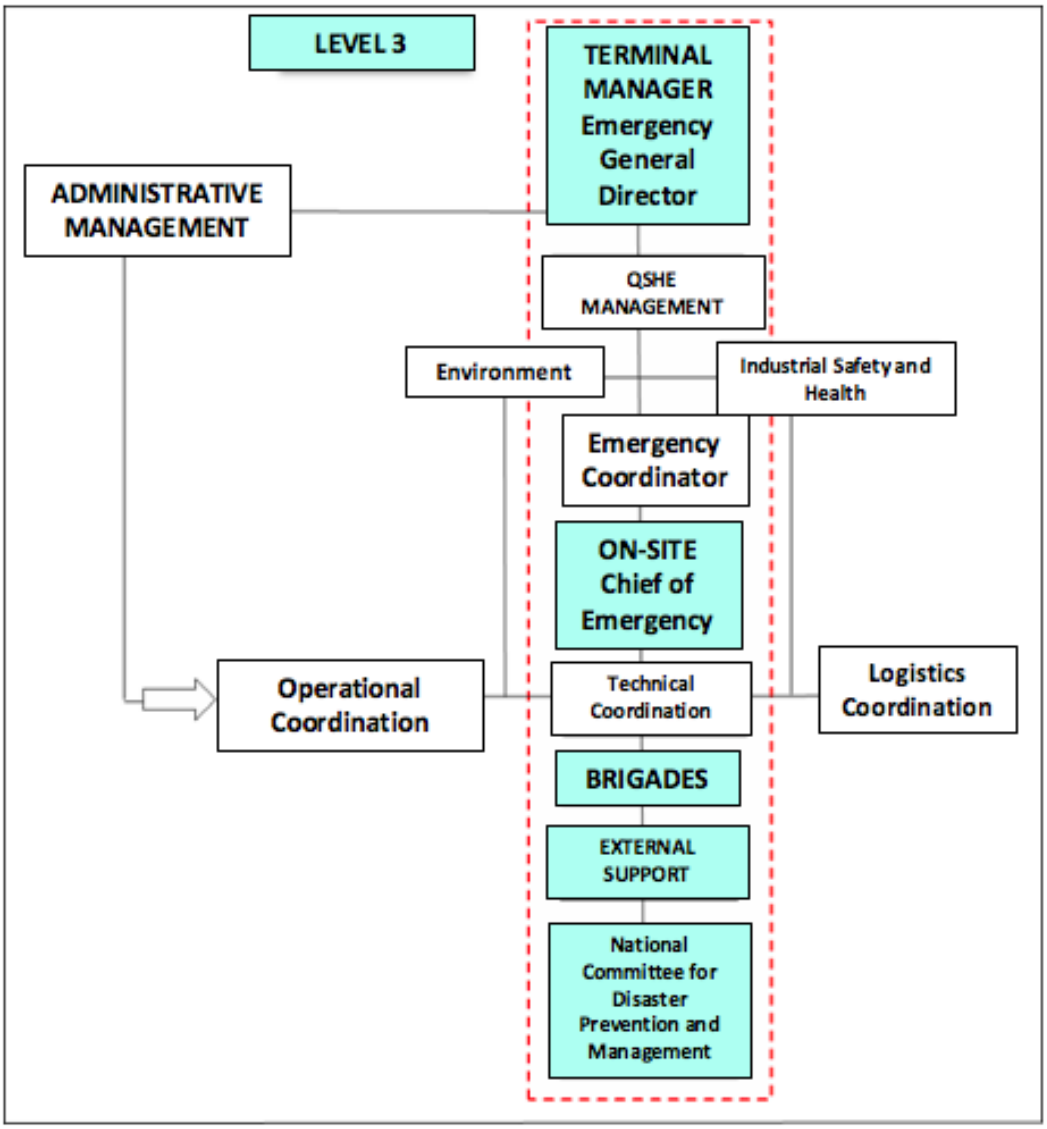

Figure 9 LEVEL 3 RESPONSE

In such cases, emergencies must be controlled through immediate, massive and total intervention of internal and external resources. The National Committee for Disaster Prevention and Response must provide its support.

9. PROCEDURES FOR EMERGENCY MANAGEMENT:

In case there is a LEVEL 1 emergency situation which affect Terminal facilities with no impact

on the vessel operation, the Terminal's control room shall notify the situation to the Vessel, in order to suspend discharge.

In LEVEL 2 and LEVEL 3 emergency situations, the Vessel and the Terminal must act in accordance with the Contingency Plan for Emergencies, which might comply with the ISGOTT reference guide (International Safety Guide For Oil Tankers and Terminals) made by SIGTTO (Society of International Gas Tanker and Terminal Operators Ltd).

In case there is an emergency situation affecting the discharge procedures, the following actions must be taken immediately:

- Activating ESD (Emergency Shut Down), emergency shut down of discharge procedures.

- Notifying the emergency to the Vessel's control room.

- Activating firefighting measures (in case they have not been activated automatically).

- Activating the Emergency Plan: the Terminal operator himself must inform the Vessel's Captain and they must coordinate joint measures and maintain constant communication with port authorities.

For LEVEL 2 and LEVEL 3 risks, the response must be general and the following guide must be followed in order to take immediate actions to control the emergency:

- Identifying and notifying the emergency site.
- Activating notification procedures.
- Temporary suspension of all operations.
- Checking the emergency plan.
- Take safety measures in order to prevent accidents and fires.
- Evacuating all professional, technical and operational personnel from the area.
- Activating the actions of the contingency plan.

Procedures for Emergency Notification

In order to notify emergencies, the appropriate channels must be established to ensure that the persons in charge of leading and coordinating the contingency plan are aware of the events and activate the plan.

Reporting the Incident or Emergency: any person who observes an unsafe condition, incident, accident, and emergency must immediately report it to his/her supervisor or the HSEQ operation manager, who is responsible for transmitting it to the Emergency Chief and for reporting the event, location and scope.

Emergency Assessment: The Emergency Chief shall immediately notify the Emergency Coordinator, who will go to the site and perform an accurate evaluation of the facts, in order to determine the need to activate the required response level and the Contingency Plan.

Activation Lines for Operational response: corresponds to the flow of information required to enable resource mobilization. Primarily, activation is usually done by telephone or any equivalent channel. If NO activation of the Contingency Plan is necessary, only LEVEL 1 response shall be activated.

The Plan Coordinating Director: (HSEQ Manager) shall proceed to assess the emergency situation and establish the accurate response level required. If the emergency exceeds the response capacity, all support companies and entities shall be notified in order to be prepared to provide any necessary support.

Support Teams in case of Emergencies:

First Aids:

Elements and/or materials for immobilization of patients, transportation of injured individuals, first aid kit and emergency medicine. Management is carried out by a health professional.

Firefighting:

ABC dry chemical extinguishers, Carbon Gas (CO2) extinguishers, water sprinkler firefighting system, foam firefighting system, FSRU firefighting system, LNGC fire system.

Transportation Equipment:

Everything needed to mobilize the personnel facing the emergency (stretchers, harnesses, ambulances, helicopters).

Spill Control:

Although LNG does not contaminate water since it cannot mix or dilute in it, rather it is quickly gasified once it comes into contact with water (rapid phase transition phenomenon), it is possible to confine the product in the water for a very short period of time, but this does not imply the use of floating containment barriers, or absorption barrier or skimmers or any other water containment system.

Communication Equipment:

Radiotelephones, loudspeakers, radios.
Personal protective equipment: helmets, gloves, masks, boots, safety clothing, etc.
Electric generator.
Tools, extensions, reflectors.

10. PORT SERVICES:

With the firm intention of hiring the best port services, equipment and professional staff, necessary evaluation visits were conducted to ensure this process. As a result, in order to comply with all Port/Terminal Regulations SPEC strongly recommended the Terminal's Preferred Agent (TPA):

Practical Pilot Services:

The request for maritime practical pilotage service must be managed through the Terminal's Preferred Agent (TPA) representing the ship-owner or the carrier. The place for the embarkation and/or disembarkation of the practical pilot is carried out three miles away to the west from the sea buoy, (75°35'56"W / 10°19'06"N); in the mooring area or in the site designated by the Port Authority of Cartagena for both berthing and departure. Such procedure is ruled by the Maritime General Direction and must comply with the Convention on the International Regulations for Preventing Collisions at Sea (Colregs). The required information will be available through the sailing directions and signals to sailors.

Tugboats

Contracting Tugboat Service.

The use of tug service will be provided by companies that meet the full requirements established by the port and maritime authorities and the standards set by the SPEC LNG Terminal. This shall be coordinated under owners request with the Terminal's Preferred Agent (TPA).

Legal Regulations on Tugboat Services.

The use of the tugboat for maneuvers within the maneuvering area is subject to the rules

and regulations issued by the Colombian maritime authority -DIMAR- and existing international standards and recommendations set forth by the International Maritime Organization -IMO-, especially regarding the technical publication approved by the international organization called "Using Harbor Tugs: a Practical Guide" (*Tug Use in Port - 2nd Edition*) or the one replacing it.

In the event that the regulations on the use of tugs issued by the DIMAR differ from the regulations or recommendations set forth by the IMO, the ones providing the highest safety levels shall prevail.

Anchorage and Boarding Point for the Practical Pilot

Practical pilot boarding point: The place for the embarkation and/or disembarkation of the practical pilot is carried out three miles away to the west from the sea buoy, (75°35’56”W / 10°19’06”N);. Anchorage outside the bay up to 12 nautical miles is prohibited, except for cases where the carrier is sent to quarantine area.

A) Anchorage: In compliance to DIMAR Resolution AR 0474 of 2014, the anchorage area serving carriers is located inside the bay of the port of Cartagena.

Anchorage Area "CP05 – CHARLIE", Carriers (Please see recent Notice to Mariners N° 227 October 28 / 2016)

Managing the Carrier’s Supplies

If necessary, the request of the vessel should be informed through the shipping agency and provisions will be provided by the authorized port operator. This activity cannot be performed while the LNG carrier is in the terminal. It must be done after discharge and operations are completed. Such operations can be carried out while the carrier is anchored, in compliance with the standards established by the Authority.

Refueling

The ability to supply refueling at the Terminal is not available.

Refueling is not allowed, however, if that is refueling is required refueling, this requirement may be approved and relevant requests shall be made by establishing a security protocol between the parties and after the approval of the Maritime Authority.

To this effect, the LNG Carrier's Captain shall inform the Terminal and the Maritime Agency as soon as possible. Refueling may only be made before or after completion of loading, however, the FSRU must stop the loading operation until refueling is completed. All contamination control equipment shall be installed and all safety procedures for transfer must be followed.

Water Supply

Supply might be carried out on the water, through a barge duly authorized and coordinated by the Maritime Authority and the Terminal.

If the terminal has this service available, it may provide such supply and the customer will pay the costs incurred for analyzing the water to be received.

Waste Management

Wastes must be delivered to the port operator registered by the port company for this purpose and must be handed inside sealed plastic bags. All wastes removed from the FSRU must be classified and document, according to MARPOL. All the costs of waste removal must be covered by the Maritime Agency representing the FSRU Master.

General Information on Protection

The dock meets the requirements set forth by the International Ship and Port Facility Security Code (ISPS Code). The Colombian Maritime Authority has issued a compliance statement.

11. WEATHER CONDITIONS:

Meteorology and Oceanography

- Weather forecast, wave height and tide height can be checked on https://www.cioh.org.co/, the website of the Caribbean Centre for Oceanographic and Hydrographic Research (CIOH, by its Spanish Acronym), an agency of the General Maritime Direction.

According to the information provided by this chart, the highest astronomic tide mentioned in the reference plane is 0.30 mts and the average is 0.15 mts.

Cartagena Bay is comprised by protected waters. The prevailing currents in the bay move southwest with an intensity of 0.1 knots, reaching 0.6 knots during summer months.

Weather

Due to its geographic location in the southwest area of the Caribbean Sea, the weather of the Bay of Cartagena is under the influence of the North-South displacements of the Intertropical Convergence Zone (ITCZ).

The ITCZ is a low-pressure, semicontinous belt located between the subtropical regions of the Northern and Southern hemispheres. This belt is also known as Subtropical Ridge, Intertropical Front or Equatorial Front.

The ITCZ movement in North or South direction is a result of subtropical physical phenomena, in addition, the sector is under the influence of atmospheric circulations of trade winds (winds from the N and NE), which come from High Pressure Centers in the East Atlantic Ocean. The incidence of East – Southeast winds is also noticeable in certain time of year.

In the area, two main climatic periods are identified: the Dry Season (summer) and Humid Season (winter), plus a transitional season[3].

Precipitation: The humid season in the port of Cartagena goes from April to November, and sometimes it even extends until the second week of December. Precipitation ranges between 29 and 244 mm/month, with the latter becoming the highest rate of rainfall in the month of October.

The Dry Season goes from December to March, with an average of .0 y 37 mm/month. In addition, the number of days with rainfalls ranges between 0.0 and 17.0 days throughout the year.

[3] Information from the Oceanographic and Hydrographic Research Center (CIOH-DIMAR)

Dry Season: during this season, going from December to March, Northwestern trade winds are prevalent and are generated due to the decrease of the high-pressure system of the Azores High, which interact with the ITCZ.

Winds range between 5 and 10 knots, and can even surpass such values and reach 30 knots[4].

Winds

The wind is perhaps the oceanographic element with the highest influence on the operations of the SPEC LNG Terminal and the ship maneuvers, since the latter have a relative low draft vs the surface exposed to the wind, impacting maneuver operations.

The positive aspect that contributes to carry out operations safely is the terminal's geographic position, since it is located in safeguarded Cartagena Bay.

As we have mentioned before, the two yearly seasons are the Dry Season, from January to April, and the Raining Season from May to December, plus a transitional dry period that goes from June to August, called "Veranillo de San Juan" (Saint John's Little Summer).

The prevailing direction of the winds is NE. Their monthly means and highs are shown in the following table:

MONTHLY MEAN [kn]											
JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
7.2	7.8	7.9	7.2	5.0	4.2	4.7	4.3	4.0	3.8	4.5	5.8
MONTHLY HIGH [kn]											
JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
25.0	29.9	24.9	25.2	23.4	22.9	24.9	26.7	22.5	24.9	20.2	26.0

Table 7. Monthly Winds.

The following figure shows the wind roses for each month of the year and the fact that only in January NE winds reach 11-17 knots.

[4] Institute of Hidrology, Meterology and Environmental Studies (IDEAM)

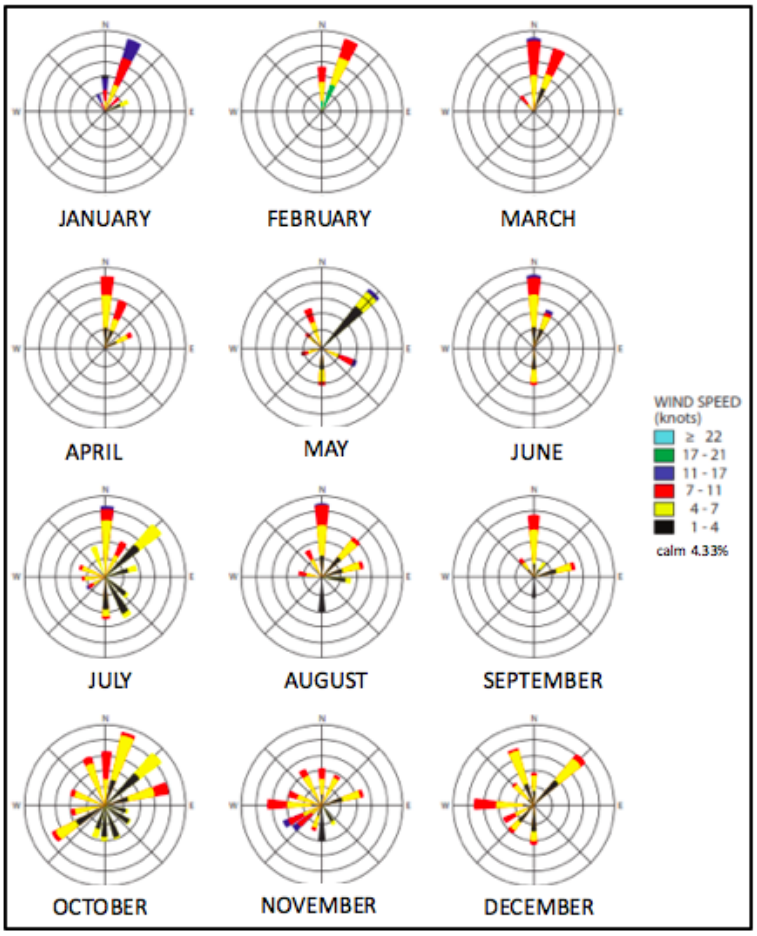

Figure 10. Wind roses during different months.

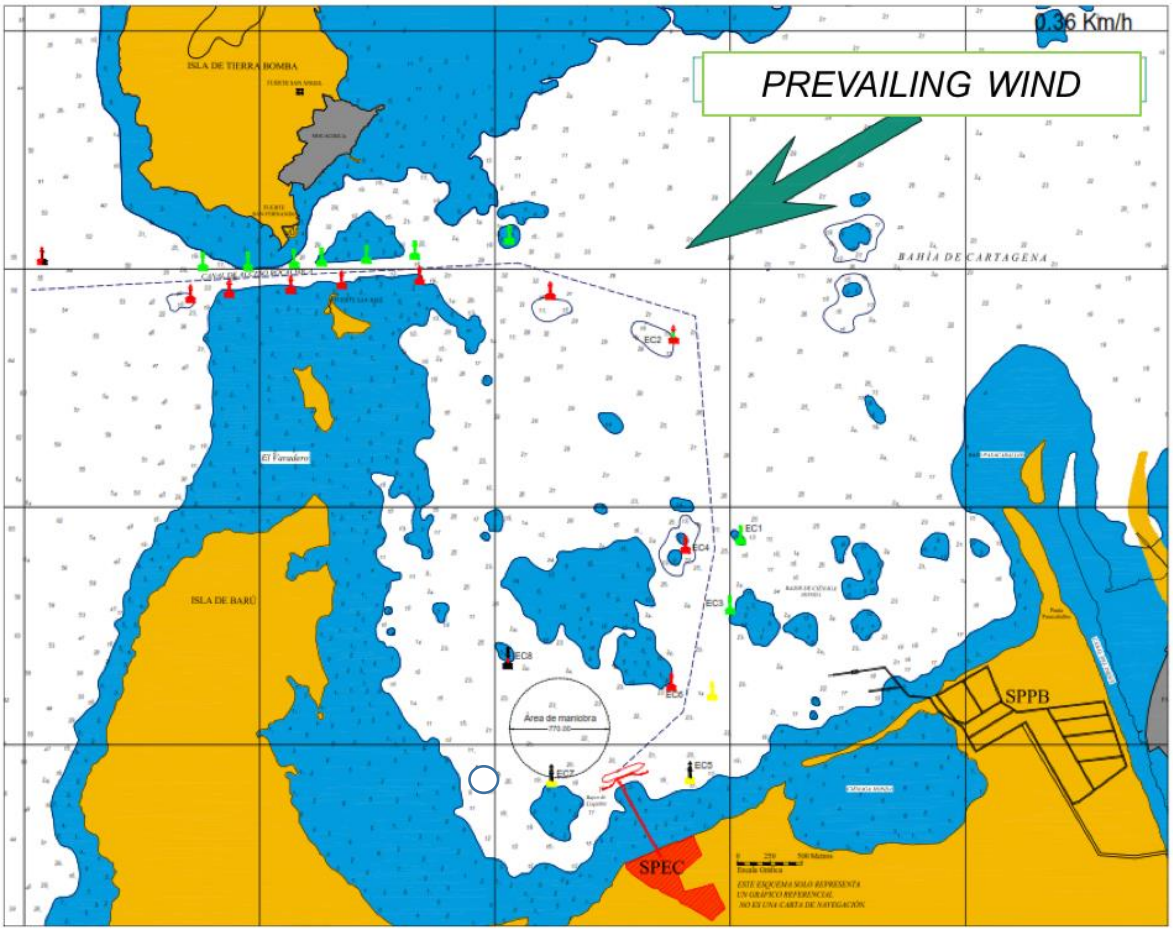

Figure 11. Annual average prevailing wind in the maneuvering area (NE).

Weather Conditions and Criteria for Using the Terminal.

Activity	Visibility (Miles)	Winds (Knots)	Current (Knots)	Waves (Meters)	Actions
Berthing / Departure	5 Nm	<20 knots	0.4	0.72	If these parameters are exceeded, all current operations must be

Table 8

Note: In the event that the LNC Carrier must departure the terminal due to bad weather conditions, the Master must issue a formal request to unmoor the ship. Mooring can only be performed again once weather conditions return to the aforementioned parameters. If the tension of the mooring line is constant and the wind is only a temporary burst, the Carrier does not need to abandon the Port.

All weather limiting conditions should preferably be described or referred to, i.e. for the terminal in general, and for the StS Operation phases (berthing, LNG transfer, departure)

Ref comment above, a reference to the Operational Limits document could be included, this document could be included as an appendix to this manual

12. CONTAMINATION AND ENVIRONMENT:

General:

LNG Carrier operating at the Terminal must take all necessary precautions to avoid contaminations, including:

Air Contamination

There are restrictions on the emission of hydrocarbon gases from the facilities during operations; therefore, such activities must be kept in the minimum levels.

Boiler blowdown and any soot generating operation are not allowed.

The following measures shall be taken to avoid contamination:

- In the event of leakages or spills of hydrocarbons or contaminating liquids, the shift supervisor must inform the incident and take initial measures to contain contamination and request any necessary assistance to complete cleaning and recovering operations.

- No oil or oily mix can escape the LNG Carrier while it is located at the dock or within the port limits.

- Throwing liquid or solid wastes or elements is not allowed. Garbage must be kept on board inside adequate containers.

- The absorbing cleaning material or sawdust used to clean the spill must be collected and send ashore for final elimination.

- Scuppers should be closed during the unloading of LNG; however, it is necessary to ensure that any accumulation of water on the deck is drained.

- Before starting and eventually during the unloading operation, periodic inspections must be conducted to ensure that no contaminated water escapes through the hull valves. The outboard discharge valves through which oil might escape shall be locked while the LNG carrier is docked. If blocking them is not feasible, appropriate means must be used to mark the valves and indicate clearly that they must remain closed.

- Unused fuel connections must be closed and empty.

Ballast

During normal operations, LNG carriers cannot discharge their ballast at the terminal. However, any LNG carrier whose intent is to discharge ballast while in the dock must change their ballast water at least 12 miles from shore before reaching the port, as set out in the Ballast Water Management Plan and the IMO guidelines. The respective report on ballast water must be delivered to the Maritime Authority upon arrival, when requested.

Releveant Local / Terminal restrictions as given in the Operational Limits document should be included in this section, or referred to

Physical Safety Policy

It is described in the Protection Plan approved by the Maritime Authority for SPEC.

Violation to SPEC Policies

In the event that during operations there are incidents considered to be violations to the policies of the SPEC LNG Terminal, the procedure established for such cases must be applied immediately, prioritizing the violating incident, i.e. if the violation resulted in an emergency, mitigation and control shall be top priority.

Exclusion zone

Refers to the 500 meters radio zone around the FSRU.

13. GENERAL RULES OF THE TERMINAL:

Alcohol, illicit drugs, weapons, matches and cigarette lighters are prohibited.

Visitors shall comply with all the indications and rules, in addition to all instructions given by a representative of the port society.

When a dangerous situation or suspicious package (abandoned bag or box) is detected, an alert must be sent to any representative of the Port Society. DO NOT TOUCH OR MOVE the package.

Every vehicle or package will be subject to checks. You MUST have an ID with photo to enter the plant, otherwise entry will be denied.

Any person acting suspiciously, taking pictures, recording videos, etc. or showing any sign of unauthorized entry, must be reported to the security staff.

While you remain in the Terminal, you must not touch or make any adjustment to knobs, valves or other controls. If you accidentally make any change to any control, you should notify any representative of the port authority to take appropriate action.

If a fire occurs in the dock, you should immediately notify a representative of the port society and tried to extinguish the fire (if safe to do so) using a portable fire extinguisher (if there is one nearby). If efforts are useless, the area must immediately evacuated.

Clothing Requirements for Visitors:
All visits and crewmembers transiting through the process area and/or dock area must meet the requirements of the SPEC protocols and must wear long-sleeved shirts, long pants and closed shoes. The plant will provide helmets when appropriate (for visitors - but not crew) and they must be worn at all times in the Terminal

Permission to go ashore

Transit through the Terminal is not allowed, unless authorized by the corresponding

authorities. The Master of each LNG Carrier shall coordinate with his Shipping Agent and Shift Supervisor to transfer his staff from the terminal to the main port and vice versa. No personnel from LNGC can transit over the FSRU to the jetty.

The LNG Carrier's crew shall use closed shoes, helmets, long sleeves and long pants when transiting down the pier.

The Shipping Agency shall leave a copy of the crew list at the main safety office and crew members going aboard or ashore must carry an ID with photo.

The LNG Carrier's crew shall pay special attention to potential fire sources.

Electronic equipment such as cellphones, cameras and computers shall not be used and they must be kept off while in the plant or the dock.

Visits to the LNG Carrier / Terminal

People who are not part of the LNG Carrier operations and require access to the dock and the LNG carrier must obtain a permit from the Terminal, and have the authorization of the Master of the LNG Carrier to come aboard. A 24-hour notification shall be required to enter the terminal area. Visitors must arrange their permissions with the Security Officer of the Terminal.

Representatives of the Maritime Authority, Port Authority, Customs and the Port Health Agency do not require any permissions.

Entry to the terminal by people without prior notification will not be allowed.

Visitors to the LNG carrier should enter the area by the main entrance and must wait until the LNG carrier has docked safely, authorized by the OPIP (Port Facility Protection Officer).

Under no circumstances visitors can walk through the terminal, unless they are accompanied by authorized Terminal personnel. The crew of the LNG carrier can walk along the pier unescorted, but must do so directly to/from the dock without stopping.

Under no circumstances visitors can make use of electronic devices, cellphones, cameras or computers while in the Terminal and they must be kept off.

Smoking is not allowed in the Terminal.

Safety Management System:

All foreign ships performing STS operations must have a certified safety management system, in compliance with Chapter 9 of the SOLAS Convention/74 as amended. National ships not covered by Chapter 9 of the SOLAS Convention/74 as amended, must be certified with the National Safety Management Standard.

Security Statement and Conditions of Use of the Terminal

While berthed at the terminal, Captains of LNG carriers using the terminal for LNG transfer must previously fill out and sign the "Security Statement and Conditions of Use" in Annex 6 of this Manual as an acceptance of responsibility and obligations under this statement.

They must also complete and sign along with the Terminal Representative the "Safety Checklist LNG Ship / Land" contained in Annex No. 1 of this Manual.

14. SPEC LNG TERMINAL AND ITS OPERATIONS:

All users of the SPEC LNG Terminal shall have previous knowledge about risks and dangers associated with LNG as well as other associated risks that might be generated while handling, transferring or transporting LNG. Such knowledge shall be demonstrated through the corresponding certification accepted by SPEC.

Any person having direct or indirect interaction while handling or transferring LNG, or remaining in the LNG transfer areas of the Terminal must have specific training requested by the Terminal.

Those people that for any reason whatsoever need to board the FSRU or the LNGC shall have a valid certification proving that they have been trained in the IMO Courses required for managing LNG carrier as established by Section A-V/I of the STCW/78 Convention as amended, without prejudice to any additional requirements for the FSRU, the LNG Carrier and/or those additional requirements set forth by the Terminal.

The SPEC LNG Terminal shall inform the interested parties of any change, update or amendment to this Manual, through any mean or channel set forth in its procedures.

The Captain will always be responsible for the safety of its ship, crew, cargo and discharge operations, and shall prevent any damages to people, private property and the environment due to hydrocarbon or contaminated water spills or accidental discharges.

The Captain of the LNGC shall verify, personally or through the appropriate officer, that his crew and the ashore personnel that may go aboard from time to time to engage in discharge operations or any other activities, comply with the provisions of this Manual.

Safety during Cargo Transfer:

All necessary precautions must be taken to avoid situations that compromise the safety of the operation, the LNGC, the FSRU or the crews, prioritizing evaluated risk prevention.

The aspects to verify the minimum conditions required for LNG transfer operations are especially focused on preventing the generation of arcing by manipulating intrinsically safe equipment and electrostatic charges, as well as on controlling sources of spark combustion and ventilation and concentration of explosive gases in cargo spaces, for which there must be noticeable prevention measures, such as:

Clear non-smoking policies and regulations and sufficient warnings stating this restriction.

Electrical connections, electrical panels, lighting and VHF and UHF communication systems and equipment should be intrinsically safe.

Restricting use of HF communication equipment with outdoor antennas, as well as radars with a frequency below 9000 MHz.

Care and control actions for grounding in electrical distribution boards.

Restricting soot cleaning as well as cleaning boilers exhausters and internal combustion engines during the loading operation

Isolation of mooring lines to eliminate current conductivity between vessels.

Elimination of electrostatic charge in loading hoses, through isolating flanges or by using hoses made to prevent the increase of static or transfer of current between the ships, etc.

Analysis of the operational situation of cathodic protection systems of both vessels. If one of the two does not work, the active must be shut down well before the approaching maneuver

Using tools, isolated stairs (among others) and handle them carefully.

Restricting work not related to cargo transfer, especially any work that may produce sparks anywhere on the ship.

Verifying the cargo's steam concentration (explosive and/or toxic) over the deck or the collectors, in such case operations must be suspended until the steam disappears.

Suspending loading operations due to current or imminent electric storms. All vents, loading systems and inert gas systems must be secured until operation can be safely restarted.

Kitchen equipment cannot use gas or any other fuel. In addition, ventilation should be located safely.

There must be firefighting equipment and dry powder on the deck for immediate use. Load monitors should be positioned toward the loading manifold and must be ready for use in automatic mode.

The doors and access gates to the cabins must be closed during cargo transfer.

The air-conditioning system of the cabins must operate in ventilation mode.

In general terms, transfer of personnel between both ships must be reduced to the minimum.

Handling and use of cellphone is restricted.

Carriers Certification

In addition to the statutory and class certificates that both the FSRU and LNGC must have, all LNGC vessels should comply with the International Gas Carrier Code (IGC) and must also have updated certificates authorizing them to transport dangerous cargos in bulk (SOLAS, Chapter VII Part C: Constructions and Equipment of Ships carrying Liquefied Gases in bulk). In addition, LNGC vessels must be built according to the International Code for the construction and Equipment of ships carrying dangerous chemicals in bulk, adopted by IMO Resolution MSC 5.

15. PROCEDURES:

The procedures used for the SPEC LNG Terminal correspond to STS operations.

Previous Meeting

Previous activities for the preparation and execution of the STS operation must start at the last port where the LNG Carrier departures to the SPEC LNG Terminal.

The activity begins with the exchange of information from cargo transfer plans, the checklists for each stage and after knowing that the terminal, the FSRU and the carrier meet the basic requirements and safely scheduling the operation. Such activity must be led by the Chief of Marine Operations of the SPEC LNG Terminal in coordination with the captains of the FSRU and the LNG carrier.

Optimal conditions must be checked by those in charge of the operation during the previous meeting.

While planning and executing STS operations, all parties involved are responsible for the safety of such operations in order to avoid any damage to the life or health of the crew, the marine environment and the integrity of the ships and their equipment. Each person in charge must respond as follows:

a) Ships involved in the STS operation must comply with the national and international sea maritime regulations and standards of the oil industry and must be appropriate for the operation to be performed and have compatible characteristics and equipment.

b) Previous inspection and check of the optimal conservation and operation status.

c) Verifying that the ships involved in the operations feature a “STS Operation Plan”, which must have been approved and incorporated into their safety management system according to the provision of the International Safety Management Code (ISM Code).

d) Verifying that the ships involved in the operations feature an “Onboard Emergency Plan for Contamination due to LNG Spills”, which must have been approved and incorporated into their safety management system according to the provision of the

International Safety Management Code (ISM Code).

e) Before organizing the STS operation, a risk assessment of the specific operation must be carried out, in compliance with probabilities and consequences and identifying the means to prevent and/or mitigate danger and to establish the procedures to face unexpected events. Such assessment must be validated according to the oil and maritime industry standards. A safety checklist must be carried out in compliance with ISGOTT, for each vessel involved in the operation.

f) Having the appropriate equipment, experience and quality service to support the operation and prepare, coordinate and have an operation and emergency plan in compliance with international regulations on cargo types and management of accidents and according to the risk assessment carried out.

Procedures before approach and mooring

The procedure to follow before approach includes a verification by the FSRU and LNGC crews, which includes:

- Verifying that primary fenders are in correct position.
- Verifying that secondary fenders are also in correct position.
- Verifying that there are no protruding elements on the sides.
- Verifying that the suitability of the LNGC's helmsman.
- Verifying that the manifolds are prepared, ready and clean.

The checklist required to verify readiness is in Annex 1 of this Manual and must be filled as exactly as possible.

A previous meeting shall be held between the Carrier and the Terminal Operator to set the unloading parameters and conditions (cooling ramp, pump start sequence, returning gas, etc.) and to examine the information required in the Terminal/Ship Safety Checklist included in Annex 1.

Safety procedure for STS discharge

Previous Information

In order to start the safety protocol associated with LNG discharge between the LNGC and the FSRU and due to its mooring position at the jetty, the SPEC LNG terminal shall request a STS operation protocol.

The protocol starts before the arrival of the LNGC and includes filling out the checklist of carrier characteristics, which must be answered as accurate as possible. This checklist includes the following question, which must be answered by both the LNGC and the FSRU:

- Maximum displacement of the receiving ship.
- Draft and freeboard of the LNGC at arrival.
- If the carrier is ready to start STS operation.
- If the crew members of both ships are enough to ensure the safety of the operation and minimize fatigue.
- Operational and maintenance status of the manifold and the charging hoses/arms system.
- Estimated highest and lowest height of the manifold in relation to the floating line during the cargo transfer.
- Exchange of the operation plans of each vessel before starting cargo transfer.
- Timely presentation of the mooring layout
- Determining which mooring lines can be operated using a winch and which cannot.
- Determining if both sides are free of protruding elements. This verification must include the bridge wings of both ships.
- In case more personnel is needed to complete the STS operation, it must be informed.

The information protocol checklist must be completed according to Annex 1.

Emergency Procedures:

If an event occurs during the operation that may impact the safety of navigation and environmental preservation, the following procedure must be followed:

a. Suspend operations.

b. Activate the previously agreed emergency alarm signal, which must be clearly understood by the crews of both ships. In case of emergency, the alarm sound will be immediately activated and there will be seven whistled warnings to inform the other ship about the emergency.

c. Inform the crew of both ships about the nature of the emergency.

d. Send the crew to their emergency positions.

e. Activate emergency procedures.

f. Empty and disconnect the loading hoses/arms.

g. Send the mooring brigades to their posts.

h. Confirm that the main engine is ready for immediate use.

i. Inform the Port Authority of the jurisdiction where the operations area is located.

Departure Procedure:

The departure procedure starts once the cargo transfer and discharge procedures are completed.

The Departure maneuver includes the following steps:

Once the carrier is completely ready for departure, the Practical Pilot will instruct the mooring of tugboats by the port bow and the port stern, considering that the ship is moored to the FSRU at the starboard.

Once the tugboats are secured, they must be placed against the ship to keep it in place against the FSRU or the dock.

The unmooring sequence between the FSRU and the carrier must be determined by the Captain of the FSRU, the Captain of the LNGC and the Practical Pilot, according to current wind and weather conditions. The LNGC's mooring lines must be released from the FSRU. If there are any back-up mooring lines sent from the FSRU to the LNGC, they must be released first from the LNGC and then the other mooring lines must be released from the FSRU.

The unmooring sequence between the LNGC and the FSRU must be determined by the master of the FSRU and the Practical Pilot, according to current wind and weather conditions.

A normal unmooring sequence starts by releasing the ropes and springs. The springs must be the last to be released.

Once all the previous ropes are onboard, the bow and sterns springs must be rapidly removed in order to have the engines ready to use.

Once all the mooring lines are released, the tugboats will start pulling to separate the carrier from the FSRU in a parallel manner by at least one beam before starting using the main engines.

From then, the bow tugboat will start pulling more strongly to guide the ship to the exit, looking out towards 030° approximately.

Once the ship is completely out of the terminal and is ready to increase its speed, the Master Pilot will instruct the release the bow tug (N°1) and the aft quarter tug (N°3). Once they have been released and separated from the ship, the departure operation is completed and the exit navigation starts.

The released tugs must be in stand by during the inner transit. Tugs N°1 and N°3 will be released until Bocachica Channel are clear.

16. DISCHARGE OPERATIONS:

All Standard Industry check list must be filled, completed and sign.

Discharge:

Once the LNG Transfer Equipment are completely cooled, the corresponding valves will open to start the discharge and closing of their by-passes.

The Control Room of the Terminal will request the Carrier to start pumping LNG and to gradually start increasing the flow, if the pressure of the tanks allows it. The discharge flow is approximately m^3/h and 5 Kg/cm^2, which is the maximum pressure.

Discharge Completion:

Once discharge is completed, the by-pass valves will be closed and the hoses will be pressurized with *5 Kg/cm2* nitrogen.

The Carrier will be requested to open its valves in order to empty the LNG contained in the hoses in addition, this operation must be repeated by opening the valves towards the last tank to receive the last portion of cargo.

Once the arms are empty, disconnection may start.

Stops during Discharge

Discharge must be suspended in case of bad weather due to wind speed or if there are electric discharges close to the Terminal.

Discharge must also be suspended in case the carrier is moving due to wind or surf.

If the movement activates the alarm of the discharge arms, they must be disconnected.

Whenever deemed necessary by the Carrier's Master or the person in charge at the Terminal.

Managing Steams:

During discharge, an important amount of boil-off gas is generated in the FSRU due to:

-heat entering the discharge system between the LNGC and the FSRU/pumps, liquid

arms, dock and mooring lines of the carriers.

-different pressure between the LNGC (100mbar/g) and the FSRU, generating flash gas.

-an increase of the FSRU level generating steam displacement. Simultaneously, the LNGC level decreases at the same speed, causing a negative displacement effect and low pressure towards the LNGC.

In order to prevent overpressure in the FSRU and aspiration by the LNGC, part of the steam displaced in the FSRU tank is sent back to the LNGC through the.

17. EMERGENCY SEQUENCE:

If there is need to perform an emergency exit on the ship, the captain must formally request to unmoor the LNGC. FSRU operators will locally release the mooring lines. The FSRU operator will activate the disconnection of the emergency Release coupler of the LNG Transfer Hoses.

On a normal working day, the following personnel must be available:

- Chief of Emergencies: Head of Plant.
- Chief of the Intervention Team: Head of Operations.
- Chief of Communications and Coordination: Head of the Prevention Unit.
- Chief of Logistics Team: Head of Maintenance.
- Operations Team: Process Operators and Shift Supervisors.
- Firefighting Team: Prevention Unit Technician.
- Logistics Team: Maintenance Technician.

If the emergency occurs outside normal working hours, the ship supervisor will be in charge until the arrival of the shift supervisor.

Obligations:

Although the SPEC LNG Terminal is obliged to notify the authorities in case of emergency, the Captain of the ship is also obliged to communicate any kind of incident to the Maritime Authority.

The SPEC LNG Terminal is responsible for any emergency that occurs in its property, including the jetty and the discharge arms, while the ship is responsible for any emergency occurring aboard.

In any case, the persons with the highest responsibility levels are the Head of Plant and the Ship's Captain.

Risks:

Risk Assessment.

It should cover all operational risks and all the means to prevent them, guaranteeing total knowledge of the operation and mitigation plans, which must be included in one document available onboard and it shall comply at least with the following conditions, objectives and criteria:

a. Identifying dangers associated with the operation, such as safe navigation, conditions that might change the proper state of loading and storage equipment and infrastructure, such as pressure of the cargo steam, environmental protection, risk of spill or contamination, safety of people on board, etc.

b. Evaluating the risks according to their probability and consequences.

c. Identifying the means to prevent and/or mitigate danger.

d. Including procedures to face unexpected incidents.

e. The level of complexity will depend on each type of operation.

18. LIMIT OPERATION CONDITIONS:

Refer to where the limit operation conditions are found, either in the Operational Limits document attached as an Appendix, or relevant sections if the limits are to be included in this document

The previous meeting shall include a risk assessment prior to operation planning, including all aspects and weather conditions affecting or determining limit STS operation conditions, which shall include:

a. Primarily, weather conditions, meteorological and water conditions and their effects on the fenders and mooring lines. All this shall include the freeboard and displacement of the FSRU and LNGC.

b. Capacity to maneuver the LNGC, the approaching speed, the specific characteristics of each ship, the crew and the work capacity of the ship.

c. Weather forecast must be checked before and after operation.

e. During mooring operations, visibility must be optimal to ensure safe maneuvers. Maneuvers shall only start once the personnel in charge considers that the conditions are appropriate to start mooring and cargo transfer.

f. Approaching, docking and mooring operations must be carried out first time in the morning. Such operations cannot be made after 17:00 local time. Therefore, these instructions must be taken into account before initiating such operations.

Condition	Port Regulations - Dimar	SPEC LNG Terminal
Time/Location of Pilot Boarding	At any time One mile sea buoy 75°35'56,8" W 10°19'06,9" N	At any time One mile west sea buoy 75°35'56,8" W 10°19'06,9" N
Conditions for Port Closure		
Visibility	minimum 1 nm	minimum 1 nm
Wind speed limit	30 Knots	20 Knots 10 m/s
Current	0.4 knots	0.4 knots
Wave height	N/A	1 meter. Not considered a challenge
Electric storm	Must stop all operations	Must stop all traffic/operations
Tide	N/A	N/A
Local/Terminal Restrictions		

Environmental		**Discharge:** Not allowed any. **Waste:** Not allowed any. No chemical disposed. **Ballast/Deballast:** OMI International Rules. (For additional request must follow Terminal Marine Operational manual).
Fuel used for power generation in the vessel		Dual: Diesel & Gas
Emissions		**Gas:** NOx: 120 mg/m3 **Liquid**: SOx: 850 mg/m3 NOx: 300 mg/m3
Noise		Terminal onshore location Day: 75 db Night: 70 db
Bunkering		LNGC: No bunker allowed alongside. FSRU: Must comply terminal rules.
Local Fishery Rules	Not allowed in transit channels	Not allowed in: Transit channels, Jetty, during berthing. Is prohibit take any species of wild flora & wildlife.
Use of Gas Combustion Unit (GCU)		Allowed
Cooling down during Berthing		Allowed
Restrictions for passing through Bocachica channel		

Time	Any time	Daylight 06:00 to 18:00
Max channel Speed (SOG)	Up to 14 Knots	Up to 12 Knots
Max. Maneuvering channel speed	12 Knots	7 Knots
Escorts tugs		Two (02) ASD tugs connected before vessel proceed towards Bocachica channel. *One third quarter forest side (N°2)* *One center lead aft. (N°4).* Max. Vessel speed: 7 Knots. Tugs bollard pull: Minimum 60 Tons.
Coast Guard escort	No	No (For additional request must follow Terminal Marine Operational manual).
Anchors		Two anchors ready.
Berthing alongside FSRU/Jetty		
Max. Wind Speed	Up to 30 Knots	Up to 20 Knots
Current speed	N/A	N/A
Tide	N/A	N/A
Wave height	N/A	1 meter.
Lateral Speed Berthing alongside FSRU		0,12 m/s
Tugs	Pilot/Captain consideration	Four (4) English language Clock orders system and power in percentage Min. 60 Tons B.P.
Conditions for Halting Unloading Operation to		

FSRU		
Wind Speed		**21 Knots** (11 m/s)
Current speed		N/A
Tide		N/A
Lighting		Poor
Order tugs		20 Knots (10 m/s)
Conditions for Stand by departure during STS Operation		
Disconnected hoses Wind Speed		**22 Knots** (11,31 m/s)
LNGC Departure Stand by; Wind speed		**23 Knots** (11,83 m/s)
Current speed		N/A
Tide		N/A
Conditions for De-berthing from FSRU		
Wind Speed		< **30 Knots** (15 m/s)
Current speed		N/A
Tide		N/A
Conditions for Halting regas FSRU Operation		
Wind (due to HPLA limit)		40 Knots (20,6 m/s)
Other		Electric storm
Other		Poor lighting
Order tugs		40 Knots (20,6 m/s)
Conditions for Stand by departure mode during Regas FSRU Operation		
Gangway operation		Up to 36 Knots 18,5 m/s (3 sec gusts)
Disconnection HPLA (wind limit)		48 Knots (25 m/s)
Remove Gangway and secure.		48 Knots (25 m/s)
FSRU staying Limit		**60 knots** (31 m/s) (N,NE,E,

		S, SW, W, NW) **50 knots** (26 m/s) (SE)

Safety Training.

There must be evidence of emergency training onboard of the ships that are involved in STS operations. Some of the exercises to be considered more frequently for training are:

a. Procedures to ring the alarm.

b. Suspension of operations during an emergency.

c. Places and preparation to start emergency procedures.

d. Deployment of mooring personnel to the emergency posts.

e. Emergency clearance and disconnection of loading hoses and loading arms.

f. Engines must be ready in the shortest time possible for maneuvers.

19. POTENTIAL RISKS ASSOCIATED WITH NG (NATURAL GAS):

- Health Risks (Choking):

People choking due to NG presence in the environment. It can be choking, since the NG is diluted in the air and the oxygen is displaced. Choking might be produced if exposed for long periods of time and if the oxygen levels decrease to 19%.

- Explosion:

An explosion can occur while handling NG in specific conditions of enclosure, high concentration and ignition. GN combustion occurs when air is between 4.5% and 14.5% gas. This can generate a destructive wave.

- Fire:

It occurs within the combustion range mentioned above (air and gas mixture with gas between 4.5% and 14.5%). Unlike an explosion, it may occur in open space and the wave produced has lesser destructive impact.

20. POTENTIAL RISKS ASSOCIATED WITH NG (LIQUID STATE):

Potential risks associated with LNG are:

- Cryogenic Nature:

Because of it very low temperatures (-162° C), LNG represents a potential risk for iron structures, equipment, instrumentation and controls. Exposure causes carbon steel embrittlement. These low temperatures can also cause injuries (freezing), therefore the facility personnel should wear gloves, masks and safety clothing designed to protect them from possible contact with the cryogenic liquid.

Keeping distances from protection zones is also important, as a result any potential risk is restricted to the boundaries of the installation and would not affect any neighboring communities.

- Explosion

  Explosion occurs when a substance rapidly changes its state. LNG tanks store the liquid at an estimated temperature of -160º C, therefore, they require pressure to keep the liquid state.

- Fire:

  If fire ignites, which may occur when there is a loss of containment of the pressured gas, a steam cloud might be produced once it returns to its gaseous state. At first, the gas is cooler and heavier than air, creating a mist (whitish), as it warms up, it is mixed with air and begins to disperse and travel, which might burn in the presence of fire or any ignition source.

  Sophisticated primary and secondary containment systems and space standards do not allow LNG contact with ignition sources if there is a loss of containment.

- RPT:

  Overpressure caused by RPT due to LNG and water interaction. If there is a loss of large LNG containment on water, the LNG could vaporize very quickly, causing an rapid transition phase. RPTs vary in intensity, from a small “pop” to significant bursts capable of damaging light structures.

- Overpressure:

  Due to thermal expansion of the LNG inside pipes and/or accessories.

- Health Risks (Choking)
  People choking due to NG presence in the environment. Even though, LNG is not carcinogenic or toxic, it can lead to choking, since the NG is diluted in the air and the oxygen is displaced. Choking might be produced if exposed for long periods of time. When it is in pure form (not color, not odor), special attention must be paid to enclosed spaces, as not having detectors makes it virtually undetectable.

21. POTENTIAL RISKS ASSOCIATED WITH NG (GASEOUS STATE):

- Health Risks (Choking)

People choking due to NG presence in the environment. It can be choking, since the NG is diluted in the air and the oxygen is displaced. Choking might be produced if exposed for long periods of time and if the oxygen levels decrease to 10%.

- Explosion:

An explosion can occur while handling NG in specific conditions of enclosure, high concentration and ignition. GN combustion occurs when air is between 4.5% and 14.5% gas. This can generate a destructive wave.

- Fire:

It occurs within the combustion range mentioned above (air and gas mixture with gas between 4.5% and 14.5%). Unlike an explosion, it may occur in open space and the wave produced has lesser destructive impact.

Risks of Transfer Operations

Rupture of the mooring lines between the FSRU and the jetty.

Causes:

- Berthing maneuver by another LNG carrier on the other side of the FSRU.
- Sudden increase of water and wind conditions.
- Another ship passing alongside.

Consequences:

- Displacement of FSRU and connections.
- Connection hoses can break.
- Possible LNG leakage.
  Mooring lines between the LNGC and the FSRU can break.
  + Posible personnel injury

Causes:

- Sudden movement of the LNGC moored to the FSRU.
- Sudden increase of water and wind conditions.
- Another ship passing alongside.

Consequences:

- FSRU displacement.
- Connection hoses can break.
- Possible LNG leakage.
- LNG leakage/spill on the platform - FSRU o LNGC.
  + Posible personnel injury

Causes:

- Broken hoses.
- Tank overflow on the FSRU.
- Another ship impacting the FSRU or LNGC
- Terrorist attack or sabotage.
- Air accident.

Consequences:

- LNG on the LNGC deck.
- Personal injuries to the crew.
- Damages to equipment.
- Potential fire on deck.
- Formation of clouds with uncertain LNG mix.

Fire on the FSRU or the LNGC

Causes:

- Problems with the ship's machinery.
- Problems with other ship's fuels.

Consequences:

- Ship damage.
- Transfer delay.
- Personal Injuries.

22. CONTROL DE CAMBIOS

No.	Descripción del cambio	Fecha	Responsable
1	Creación del documento	25/07/2016	División técnica Presermar
2	Cambio de logo SPEC LNG	27/09/2022	Coordinador de Operaciones Maritimas.

23. ANNEXES

ANNEX 1
CHECKLIST 1- PRE-FIXTURE INFORMATION

SHIP TO SHIP TRANSFER CHECKLIST 1 – PRE-FIXTURE INFORMATION (FOR EACH SHIP) (BETWEEN SHIP AND SPEC)		
Ship Operator:	Ship Charterer:	SPEC LNG Terminal:
Ship´s Name:	Company:	

Call Sign/INMARSAT No:		Proposed Date of Transfer:	
IMO Number:		Proposed Location:	
Discharging / Receiving Ship (Delete as appropriate)		***Ship Operator's Confirmation***	**Remarks**
1	Current vessel particulars questionnaire (VPQ) data has been exchanged.		
2	State the anticipated maximum berthing displacement of the ship.		
3	State the anticipated arrival draughts and freeboard.		
4	If the berthing operation is to be conducted underway, confirm that the ship can maintain about five knots for a minimum of two hours.		NON APPLICABLE
5	The ship is able to conduct operations in accordance with the latest edition of the Ship to Ship Transfer Guide		
6	Sufficient manpower will be provided to ensure the safe conduct of operations while minimizing the potential for fatigue.		
7	Key vessel personnel can communicate in English. If not, state working language used.		
8	The ship's manifold arrangement and lifting gear is in accordance with OCIMF or SIGTTO recommendations for the ship type/size.		
9	State the maximum and minimum expected height of the cargo manifold from the waterline during the transfer.		
10	The SWL and outreach of the ship's lifting equipment is sufficient for the intended operation.		
11	Where applicable, a copy of the STS operations plan has been exchanged.		
12	If not included within the STS operations plan, a general arrangement plan or other similar mooring diagram has been exchanged.		

13	The location and number of enclosed fairleads and mooring bitts fitted on the ship is in accordance with Mooring Equipment Guidelines (reference 6)		
14	The ship is able to deploy all lines on winch drums.		
15	Messenger lines of suitable strength will be available at each mooring location.		
16	MSDS information has been exchanged for the cargo being transferred and, where applicable, the previous cargo of the receiving ship.		
17	Both sides of the ship are clear of any overhanging projections, including bridge wings.		
18	Sufficient accommodation is available on board for STS personnel.		
Additional for Oil Transfers:			
19	Confirm the vessel is equipped to conduct vapor balancing.		NON APPLICABLE

FOR DISCHARGING / RECEIVING SHIP (delete as appropriate)	
Name:	
Rank or Position in Company:	
Signature:	Date:

ANNEX 2
CHECKLIST 2- BEFORE OPERATIONS COMMENCE

SHIP TO SHIP TRANSFER CHECKLIST 2- BEFORE OPERATIONS COMMENCE
Discharging Ship's Name
Receiver Ship Name:

Name of Designated POAC:			
Name of STS Superintendent if Different from POAC:			
		Checked	**Remarks**
1	A copy of the completed checklist 1 has been Received.		
2	A copy of the JPO that encompasses the entire transfer operation has been received.		
3	Personnel will comply with the hours of work and rest requirements of IMO and national regulations, as appropriate.		
4	Radio communications, including back-up systems, have been agreed and tested and clocks have been synchronized between the ships.		
5	The language of operations has been agreed.		
6	The rendezvous position of the transfer area has been agreed.		NON APPLICABLE
7	Information on ship handling characteristics has been exchanged, including details of any critical main engine revolutions and corresponding speed.		NON APPLICABLE
8	Approach, maneuvering and mooring plans are understood and confirmed.		
9	Mooring procedures have been agreed, including fender positions and number/type of ropes to be provided by each ship.		
10	The system and method of electrical isolation between the ships has been agreed.		
11	The ship is upright and at a suitable trim, without any overhanging projections.		
12	Maneuvering, mooring and navigational equipment has been tested and found in good order.		
13	Cargo transfer system safety devices, including IG and emergency shutdown (ESD) systems, where applicable, have been proven operational not more than 48-hours prior to the operation.		
14	The ship's boilers and tubes have been cleared of soot and it is understood that during STS operations, tubes must not be blown.		NON APPLICABLE
15	Engineers have been briefed on engine speed (and speed adjustment) requirements.		NON APPLICABLE
16	Weather forecasts have been reviewed for the transfer area and arrangements have been made for their continued receipt throughout the operation.		
17	The hose lifting equipment is suitable and ready for use.		
18	The cargo transfer hoses/arms have been tested and certified and they are in apparent good condition.		
19	The fenders and associated equipment are visually in good order.		
20	The crew has been briefed on the mooring Procedure.		
21	The contingency plan is agreed and an appropriate emergency drill has been conducted.		
22	Local authorities have been advised of the STS operation.		
23	A navigational warning has been broadcast.		NON APPLICABLE

24	Monitoring is in place for accommodation, void spaces, pump room, compressor and motor rooms, as applicable, to detect possible flammable atmospheres.		
25	The other ship has been advised that checklist 2 is satisfactorily completed.		
FOR DISCHARGING / RECEIVING SHIP (delete as appropriate)			
Name:			
Rank:			
Signature:		Date:	

ANNEX 3
CHECKLIST 3- BEFORE RUN-IN AND MOORING

SHIP TO SHIP TRANSFER **CHECKLIST 3 – BEFORE RUN-IN AND MOORING**
Discharging Ship's Name
Receiving Ship Name:
Name of Designated POAC:

Name of STS Superintendent if Different from POAC:			
Date and Location of Transfer:			
		Checked	**Remarks**
1	Checklist 2 has been satisfactorily completed.		
2	Primary fenders are correctly positioned and fender rigging is in order.		
3	If required, secondary fenders are correctly positioned and secured.		
4	There are no overhanging projections on the side of berthing.		
5	A proficient helmsman is at the Wheel.		
6	Cargo manifold connections are prepared, blanked and marked.		
7	Course and speed information has been exchanged and agreed.		NO APPLICABLE
8	The method for controlling the ship's speed adjustment, e.g. by changes to revolutions, propeller pitch or by telegraph, has been agreed.		NO APPLICABLE
9	Navigational signals are displayed.		NO APPLICABLE
10	Adequate lighting is available.		
11	Power is available for winches and they are in good order.		
12	Rope messengers, rope stoppers and heaving lines are ready for use.		
13	All mooring lines are ready.		
14	Fire axes, or suitable cutting equipment, are in position at the fore and aft mooring stations.		
15	Crew are standing by at their mooring stations.		
16	Communications are established with mooring personnel and with the other ship.		

17	Fire-fighting and anti-pollution equipment is ready for use.		
18	Shipping traffic in the area is being monitored.		NON APPLICABLE
19	The vessel status has been appropriately set on the Automatic Identification System (AIS).		
20	The other ship has been advised that checklist 3 is satisfactorily completed.		

FOR DISCHARGING / RECEIVING SHIP (delete as appropriate)

Name:	
Rank:	
Signature:	Date:

ANNEX 4
CHECKLIST 4 – BEFORE CARGO TRANSFER

SHIP TO SHIP TRANSFER **CHECKLIST 4 – BEFORE CARGO TRANSFER**
Discharging Ship's Name
Receiving Ship Name:

Name of Designated POAC:			
Name of STS Superintendent if Different from POAC:			
Date and Location of Transfer:			
		Checked	**Remarks**
1	Checklist 3 has been satisfactorily completed.		
2	A standard pre-transfer checklist, such as the ISGOTTship/shore safety checklist or equivalent, has been satisfactorily completed and arrangements have been made for repetitive checks during the transfer.		
3	Required regional checklists have been completed.		
4	Procedures for the transfer of personnel have been agreed.		
5	If used, the gangway is correctly positioned and well secured.		
6	Inter-ship communication systems, including back-up, are agreed and tested.		
7	Emergency signals and shutdown procedures are agreed.		
8	The engine room will be manned as required throughout the transfer and the main engine maintained on standby or on short notice of readiness.		NON APPLICABLE
9	A bridge watch and/or an anchor watch is Established.		NON APPLICABLE
10	Officers in charge of the cargo transfer on both ships are identified and details have been exchanged and posted.		
11	A deck watch has been established to pay particular attention to moorings, fenders, hoses, manifold areas and overside.		
12	The initial cargo transfer rate has been agreed with the other ship.		

13	The maximum cargo transfer rate is agreed and recorded, taking into account the maximum flow rates of the transfer system, including hoses.		
14	Arrangements have been made for the regular exchange of information on quantities of cargo transferred.		
15	The topping-off rate has been agreed and recorded.		
16	The procedure for stopping transfer is agreed.		
17	Ballasting and deballasting arrangements are Agreed.		
18	Cargo hoses are well supported and protected from chafing and the hose release area is clear of obstructions.		
19	Tools required for rapid disconnection are located at the cargo manifold.		
20	Messengers are prepared and positioned ready for unmooring in accordance with the unmooring plan.		NON APPLICABLE
21	Details of the previous cargo of the receiving ship, including any hazardous or toxic properties, have been given to the discharging ship.		
22	Security information has been exchanged and, if required, a Declaration of Security has been completed.		
23	The other ship has been advised that checklist 4 is satisfactorily completed.		
24	Vapour differentials and maximum pressures have been agreed		
25	Procedures for increasing/reducing transfer rates have been agreed		
26	Procedures for the control of vapor pressure have been agreed		
27	The potential for cargo roll-over has been considered		
28	Where fitted, ESD links or pendant arrangements are in place and tested		
29	The deck watch is aware of the location and activation method of ESD systems on deck		

30	Cargo safety and monitoring systems are operational		
FOR DISCHARGING / RECEIVING SHIP (delete as appropriate)			
Name:			
Rank:			
Signature:		Date:	

ANNEX 5
CHECKLIST 5 – BEFORE UNMOORING

SHIP TO SHIP TRANSFER **CHECKLIST 5 – BEFORE UNMOORING**
Discharging Ship's Name
Receiving Ship Name:
Name of Designated POAC:

Name of STS Superintendent if Different from POAC:			
Date and Location of Transfer:			
		Checked	**Remarks**
1	Cargo hoses are properly drained prior to hose disconnection.		
2	Cargo hoses or manifolds are securely blanked.		
3	The transfer side of the ship is clear of obstructions (including hose lifting equipment).		
4	The method of letting go moorings and separation of ships has been agreed and crew have been briefed on procedures.		
5	The fenders, including fender rigging, are in good order.		
6	Secondary fenders are correctly positioned and secured for departure.		
7	Power is available for mooring winches.		
8	Rope messengers and rope stoppers are available at all mooring stations.		
9	Crew are standing by at their mooring Stations.		
10	Communications are established with mooring personnel and with the other ship.		
11	Shipping traffic in the area is being monitored and a very high frequency (VHF) alert has been transmitted.		
12	Maneuvering, mooring and navigational equipment has been tested and is ready for departure.		
13	Mooring personnel have been instructed to let go only as directed by the Master.		
14	Agreement has been reached that navigational warnings will be cancelled and AIS status updated when clear of the other ship.		

15	The other ship has been advised that checklist 5 is satisfactorily completed.		
16	Cargo hoses are properly isolated, drained and purged with nitrogen prior to disconnection.		

FOR DISCHARGING / RECEIVING SHIP (delete as appropriate)	
Name:	
Rank:	
Signature:	Date:

ANNEX 6
Security Statement and Conditions of Use of Terminal
SPEC LNG Terminal – Sociedad Portuaria El Cayao S.A E.S.P.

Company: SPEC LNG Terminal.
Date:

To the Captain: Sir,

Security operations performed while your LNG Carrier is docked at the Terminal or alongside the FSRU, constitute a shared responsibility between you, as the Captain of the LNG Carrier, and the representative appointed by the Terminal.

Therefore, before starting operations, it is our desire to confirm that we have all your cooperation, agreement and understanding of the safety requirements and conditions of use set out in the on board/onshore safety checklist and in the Operations Manual for the SPEC Maritime Terminal, which were designed based on safety practices published and accepted by the oil and gas industry and on the transportation of these products by the Maritime Authority and SPEC.

We, at the SPEC LNG Terminal, expect that you and the crew under your command, abide by these requirements while you are at the Terminal, which will ensure that the Terminal's personnel complies with the established procedures and requirements, in order to achieve the common interest of carrying out safe and efficient operations.

Before starting operations and eventually later, and in order to confirm that the safety standards are being fulfilled, a member of the SPEC LNG Terminal, along with an officer in charge if needed, will carry out a routine inspection of your LNG Carrier to ensure that the questions in the on board/onshore safety checklist have been answered positively. Should any corrective action be taken, we will not authorize any operations, and if operations have already started, they will be suspended.

In addition, if you consider that safety has been compromised due to actions by the SPEC LNG Terminal personnel, the plant personnel or in any case due to equipment under the control of SPEC, you must require the immediate suspension of operations.

Receipt of this letter is confirmed by signing and returning the attached copy.

Signature:_____
SPEC LNG Terminal Representative: _____
The Terminal Representative in charge is: _____
Position or Title: _____Telephone: _____
UHF/VHF Channel:_____
Signature by the Captain or Officer in Charge of the Carrier: _____
Date: _____Time: _____

24. References

This manual was made using the information provided by Sociedad Portuaria El Cayao S.A. E.S.P., through the following documents:

Study on handling LNG carriers

Simulation studies made by SPEC

Contingency plan for emergencies during transfer operations of liquefied natural gas (LNG).

Public Information, website of the Oceanographic and Hydrographic Research Center (CIOH, by its Spanish acronym).

Operations Manual of Mejillones Terminal in Chile

Safety interface procedure between ENAGAS LNG terminal in Barcelona and the ship

1. Ship To Ship Transfer Guide for petroleum, chemicals and liquefied Gas (ICS/OCIMF/SIGTTO/CDI).

2. International Safety Guide for Oil Tankers and Terminals (ISGOTT) ICS/OCIMF/IAPH,

3. Guidelines for the Handling, Storage, Inspection and Testing of Hoses in the Field (OCIMF)

4. Recommendations for Oil Tanker Manifolds and Associated Equipment (OCIMF),

5. Guide to Helicopter/Ship Operations (ICS)

6. Mooring Equipment Guidelines (OCIMF).

7. Manual on Oil Contamination, Part 1 - Prevention, as amended, IMO

8. British Standards BS1435-2

9. Peril at Sea and Salvage: A Guide for Masters (ICS/OCIMF)

10. International Safety Guide for Oil Tankers and Terminals (ISGOTT) (ICS/OCIMF/IAPH)

11. International Regulations for Preventing Collisions at Sea (COLREGS) (IMO)

12. Standard Marine Communication Phrases (IMO).

13. International Convention on Standards of Training, Certification and Watchkeeping

and STCW Code (IMO).

14. Recommendations for Ship's Fittings for Use with Tugs with Particular Reference to Escorting and the Other High Load Operations (OCIMF).

15. International Ship and Port Facility Security (ISPS) Code and SOLAS Amendments 2002 (IMO).

16. Guidelines on the Use of High-Modulus Synthetic Fibre Ropes as Mooring Lines on Large Tankers (OCIMF) Bridge Producers Guide (ICS).

25. CHANGE CONTROL

Does not apply.