LNG Terminal in Świnoujście

Marine Operations Manual

PE-PP-10-1
### Characteristics, issues, distribution and revisions of the document

#### Document characteristics

<table>
<thead>
<tr>
<th>Subject area</th>
<th>Terminal Operations</th>
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<td>Category</td>
<td>Marine Operations</td>
</tr>
<tr>
<td>Concept owner</td>
<td>Adam Łupkowski</td>
</tr>
<tr>
<td>Related internal regulations</td>
<td>Terminal Code, Operating Manual – Unloading System (10) - PE-OI-10-3-2, LNG Carrier Approval Procedure - PE-PP-10-1-6</td>
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#### Rozdysponowanie wersji papierowej dokumentu i dekretacja

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Regulation is purely technical and functional. It is not a subject of Company Legal Department review as such.

#### Updates

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<th>APPROVED BY</th>
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<tr>
<td>2.0</td>
<td>Technical validation based on LNG supplier’s feedback</td>
<td>Adam Łupkowski</td>
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<td>08.01.15</td>
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<tr>
<td>3.0</td>
<td>Implementation of changes in Port Regulations (wind speed limit for port entry, no. of pilots for departure), removal of SSI, general amendments</td>
<td>Adam Łupkowski</td>
<td></td>
<td></td>
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**VERSION IN FORCE FROM:**

**APPROVED BY:**

No. PE-PP-10-1 – Ver. 3.0
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# Table of contents

Characteristics, issues, distribution and revisions of the document .............................................. 2

A.  Introduction ................................................................................................................................. 8

B.  Objective of this document ........................................................................................................ 9

C.  General information .................................................................................................................. 10

   C.1 Description of the terminal; .................................................................................................. 10

   C.2 Location; ............................................................................................................................... 11

   C.3 Hydrometeorological conditions; ......................................................................................... 11

   C.4 Charts and nautical publications: ......................................................................................... 15

   C.5 Requirements concerning tugs .............................................................................................. 16

   C.6 Requirements concerning fire-fighting ship ......................................................................... 20

   C.7 Requirements concerning the notification of arrival of the LNG carrier at the terminal ................................................................. 20

D.  Terminal safety regulations and policy ....................................................................................... 24

   D.1 Restricted access zone around the LNG carrier. ................................................................. 24

   D.2 Consequences of breaching the terminal security rules ...................................................... 24

   D.3 Reference to the health and safety and environmental protection rules in force at the terminal ................................................................................. 25

   D.4 Reference to safety regulations and checklists (ISGOTT 5th edition) .................................. 26

   D.5 Rules concerning the persons visiting the ship .................................................................... 27

   D.6 Terminal drug and alcohol policy ........................................................................................ 28

E.  Procedures of entry into the outer port in Świnoujście – PE-PP-10-1-1 .................................. 29

   E.1 General information concerning the commercial port in Świnoujście. .............................. 29

   E.2 The approach fairway, available anchorages and rules of their use by LNG carriers ......... 30

   E.3 Communication with Maritime Administration ................................................................. 33

   E.4 Communication between the ship and terminal operator .................................................. 36

   E.5 SSI & Vessel Compatibility Study ....................................................................................... 37

   E.6 Condition of ship tanks and cargo system upon arrival ...................................................... 39

   E.7 Information on pilot services ............................................................................................... 39

   E.8 “Master/Pilot Exchange” checklist ..................................................................................... 42

   E.9 Conclusions of the FMBS ..................................................................................................... 43

F.  Berth approach, mooring and berthing procedures – PE-PP-10-1-2 ........................................ 46

   F.1 Operational limits of the terminal (permissible carrier parameters) ................................. 46
F.2 Maximum allowed hydrometeorological conditions during entrance/departure from the port ................................................................. 47
F.3 Port Regulations requirements for mooring assistance ....................... 48
F.4 Terminal Operator requirements for mooring assistance and berth equipment ................................................................. 49
F.5 Berth equipment................................................................................... 52
F.6 International Shore Connection ............................................................ 52
F.7 Taking provisions and stores by the ship ............................................... 52
F.8 Bunkering............................................................................................... 53
F.9 Repairs.................................................................................................. 53
F.10 Managing ballast water......................................................................... 53
F.11 Wastewater and waste disposal rules .................................................. 53
F.12 Shore leave ........................................................................................... 54
F.13 Preparation of the berth for the LNG carrier in winter conditions .......... 54
G. Cargo operations – PE-PP-10-1-3.......................................................... 55
G.1 General information.............................................................................. 55
G.2 Supervision over the operation and division of responsibilities ............. 56
G.3 Gangway positioning............................................................................ 58
G.4 LNG unloading procedure and pre-discharge meeting ......................... 59
G.5 Connection of unloading and BOG return arms .................................... 61
G.6 Leak test and pressure test .................................................................. 61
G.7 Preliminary CTMS measurement............................................................ 61
G.8 BOG handling system configuration...................................................... 62
G.9 "Warm ESD" test .................................................................................. 62
G.10 Unloading arm and line cool-down....................................................... 63
G.11 "Cold ESD" test ................................................................................... 63
G.12 Unloading commencement and control .............................................. 63
G.13 Cargo sampling.................................................................................... 64
G.14 Unloading completion.......................................................................... 64
G.15 Drainage and nitrogen purge of unloading arms .................................. 64
G.16 Final CTMS measurement and post-discharge meeting ....................... 66
G.17 Disconnection of unloading and BOG return arms ............................. 66
G.18 Post-discharge documentation.............................................................. 67
H. Emergency procedures – PE-PP-10-1-4................................................. 67
H.1 Source regulations and industry guidelines.......................................... 67
H.2 Introduction........................................................................................... 67
H.3 Goal of this section............................................................................... 68
H.4 Range .......................................................................................................................... 68
H.5 Emergency situations within the berth................................................................. 74
H.6 Emergency situations on the LNG tanker.......................................................... 77
H.7 Detection of an emergency situation by the ship at the berth...................... 81
H.8 Evacuation of the ship and evacuation of the LNG unloading platform ...... 81

I. List of contacts ............................................................................................................. 84

J. Appendices .................................................................................................................. 88
   J.1 Appendix No. 1 – List of documents – PE-PP-10-1-W1 ..................................... 88
   J.2 Appendix No. 2 – SSSCL with filling instruction – PE-PP-10-1-F-1 .................. 90
   J.3 Appendix No. 3 Checklist – Pre-discharge meeting – PE-PP-10-1-F-2 ............ 106
   J.4 Appendix No. 4 – Safety Letter – PE-PP-10-1-F-4 ............................................. 108
   J.5 Appendix No. 5 – Marine Operations Algorithm – PE-PP-10-1-Z-1 .......... 109
   J.6 Appendix No. 6 Notification of Departure from the Port of Loading – PE-PP-10-1-F-5 110
   J.7 Appendix No. 7 Notification of Arrival – PE-PP-10-1-F-6 ................................ 112
   J.8 Appendix No. 8 – Key technical compatibility data (for details please refer to the latest PLNG SSI Check List) ................................................................. 114
   J.9 Appendix No. 9 – Unloading arms work range and configurations – PE-PP-10-1-W3 117
   J.10 Appendix No. 10 Quick release hook and fender – PE-PP-10-1-Z-2 .......... 120
   J.11 Appendix No. 11 – Schematics and parameters of the gangway tower and the gangway, the range and SWL of the crane – PE-PP-10-1-W5 ........ 122
   J.12 Appendix No. 12 – LNG carrier area evacuation route – PE-PP-10-1-W4 .... 125
   J.13 Appendix No. 13 – Jetty readiness checklist – PE-PP-10-1-F-7 ..................... 126
   J.14 Appendix No. 14 – Hazardous zones around LNG carrier ....................... 128

K. Literature ..................................................................................................................... 129
## Abbreviations used in the Marine Operation Procedures

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Berthing Line</td>
<td>The vertical interface formed between the jetty fenders and the ship’s side resting against them.</td>
</tr>
<tr>
<td>BHMW</td>
<td>Biuro Hydrograficzne Marynarki Wojennej – Naval Hydrographic Office</td>
</tr>
<tr>
<td>Chart Datum</td>
<td>A chart datum is the level of water that charted depths displayed on a nautical chart are measured from.</td>
</tr>
<tr>
<td>ESD</td>
<td>Emergency Sequence Disconnection (Emergency Shut-Down as related to ship/shore operations).</td>
</tr>
<tr>
<td>ETA</td>
<td>Estimated Time of Arrival.</td>
</tr>
<tr>
<td>Exclusion Zone</td>
<td>An exclusion zone established around the jetty within all other ships and service craft are not permitted.</td>
</tr>
<tr>
<td>GIIGNL</td>
<td>Groupe International des Importateurs de Gaz Naturel Liquéfié.</td>
</tr>
<tr>
<td>Hard Arms</td>
<td>Unloading Arms.</td>
</tr>
<tr>
<td>Heel</td>
<td>The amount of LNG retained in a ship’s cargo tanks at the end of discharge to keep tank condition cold during return voyage.</td>
</tr>
<tr>
<td>IMO</td>
<td>International Maritime Organization.</td>
</tr>
<tr>
<td>Jettyman</td>
<td>The Terminal operator assigned for watchkeeping duties on the jetty.</td>
</tr>
<tr>
<td>LSL</td>
<td>Lowest Sea Level.</td>
</tr>
<tr>
<td>LNG</td>
<td>Liquefied Natural Gas and its principal constituent - methane. It is held at close to atmospheric pressure at a temperature of about -163°C.</td>
</tr>
<tr>
<td>LLW</td>
<td>Low Level Water.</td>
</tr>
<tr>
<td>Terminal Representative</td>
<td>The Terminal employee appointed to manage marine operations.</td>
</tr>
<tr>
<td>MOM</td>
<td>PLNG Marine Operations Manual / also known as Marine Operation and Safe LNG Carrier Berthing Procedures</td>
</tr>
<tr>
<td>MSL</td>
<td>Mean Sea Level.</td>
</tr>
<tr>
<td>Mooring gang</td>
<td>Shore side team (subcontracted) deploys the mooring lines according to the agreed mooring plan.</td>
</tr>
<tr>
<td>OCIMF</td>
<td>Oil Companies International Marine Forum.</td>
</tr>
<tr>
<td>Operating Envelope</td>
<td>The three dimensional zone traced out by the changing position of the ship’s manifold connection that can be covered during normal operations by the hard arms.</td>
</tr>
<tr>
<td>Panel Operator</td>
<td>The terminal operator assigned to permanently attend the control panel in the Terminal Control Room.</td>
</tr>
<tr>
<td>Parallel Body</td>
<td>The area of a ship’s side comprising flat plates. It is the area on the ship’s hull where the jetty fenders can support the LNG carrier.</td>
</tr>
<tr>
<td>PERC</td>
<td>Powered Emergency Release Coupling.</td>
</tr>
<tr>
<td>PPE</td>
<td>Personal Protective Equipment.</td>
</tr>
<tr>
<td>PFSO</td>
<td>Port Facility Security Officer.</td>
</tr>
<tr>
<td>QC/DC</td>
<td>Quick Connect / Disconnect Coupler.</td>
</tr>
<tr>
<td>Ship’s Agent</td>
<td>The Ship’s Agent appointed by ship owner/operator to protect and support their interests while the LNG carrier is in port.</td>
</tr>
<tr>
<td>Safety Management System</td>
<td>The terminal’s system for controlling on-site safety in accordance to national and international legislation such as International Safety Management Code.</td>
</tr>
<tr>
<td>UKHO</td>
<td>United Kingdom Hydrographic Office.</td>
</tr>
<tr>
<td>Shift Leader</td>
<td>The terminal employee assigned to manage the shift.</td>
</tr>
</tbody>
</table>
A. Introduction

The Marine Operations Manual (MOM) has been drawn up by PLNG S.A. in cooperation with the Maritime University in Szczecin for the needs of the Świnoujście LNG terminal users, hauliers, ships' captains and agents. This instruction contains key terminal access procedures, approach procedures, operation procedures, connection drawings, compatibility procedures and legal notes. The Marine Operations Manual specifies and complements the Terminal Code with regard to marine operations management by the Terminal Operator.

The Marine Operations Manual meets the requirements set out in Port Regulations Article 154 items 1, 2, and 3 in the part constituting “berth safe operations instruction” and “instruction for safe unloading of LNG.” MOM describe the safety conditions for mooring operations, LNG unloading and storage PLNG Terminal area. MOM indicate the Loading Master as an accountable person for LNG unloading operation. PLNG S.A. together with the Maritime University in Szczecin has put all effort in order to ensure compliance of this manual with actual situation as well as Polish and international law regulations. However, PLNG S.A. cannot be held liable for any disparities between the contents of the Marine Operations Manual and applicable regulations. Familiarizing with the Marine Operations Manual shall be mandatory for all parties involved in the operation comprising port entrance, mooring, unloading, un-berthing and departure of the LNG carrier from the port. Familiarizing with the Marine Operations Manual does not release any party from the obligation to obtain information necessary for safe performance of a given operation directly from the sources such as Port Regulations, Terminal Code, nautical charts and navigation publications as well as adequate process instructions. PLNG S.A. reserves the right to modify and supplement the Marine Operations Manuals if this is required by the necessity to increase the safety level or changes in applicable law. The current version of the Marine Operation and Safe LNG Carrier Berthing Procedures can be found on the Świnoujście LNG terminal operator’s website www.polskielng.pl
B. Objective of this document

The goals for which the Marine Operations Manual has been prepared are as follows:

- Provision of general and contractual information for the terminal user and ship’s captain which is necessary for safe berthing, unloading and departure from the port.
- Provision of information for the terminal user and LNG carrier’s captain concerning safety rules and procedures in force at the LNG Terminal in Świnoujście.
- Providing the terminal user and LNG carrier captain with supplementary information necessary for conducting the SSI & Vessel Compatibility study and references to “LNG Carrier Approval Procedure” by PLNG.
- Provision of technical information concerning the marine part of the terminal, mooring procedure, mooring equipment and unloading system.
- According to § 154 point 1. of the Port Regulations “Unloading and storage of dangerous goods except for bunkering operations and desloping operations, shall be carried out under the condition described in berth safe operation instruction, prepared by Terminal Operator and submitted to the Director of Maritime Office in Szczecin for his review in the subject of nautical safety”. Therefore the Marine Operations Manual in the marine part shall be subject to review of the Director of the Maritime Office in Szczecin.
C. General information

C.1 Description of the terminal;

The Marine LNG Terminal is located on Wolin island next to Świna river estuary. The terminal may be approached through the Baltic Sea (Pomeranian Bay) via a fairway dredged to 14.5 m, within the external port basin being also dredged to the depth of 14.5 m. Mooring at the unloading platform shall be carried out on the ship’s starboard side. The approach, turning and mooring shall be performed with assistance of tugboats. The maneuvering operation is based on detailed simulations of LNG vessel movement (Full Mission Bridge Simulation – FMBS) in the range of vessel cargo capacity between 120,000 and approximately 217,000 m$^3$. The results of FMBS studies are described in section E9 of this manual. The berth of PLNG Terminal in Świnoujście is equipped with 4 breasting dolphins and 6 mooring dolphins. Double sets of quick release mooring hooks are installed on the outer and inner breasting dolphins and all mooring dolphins except for outer mooring dolphins MD1 and MD6 with sets of triple hooks. The overall number of mooring hooks is 22.

The unloading is executed with 3 liquid unloading arms and one BOG return (Vapor Return) arm. Total gross capacity of two terminal tanks amounts to approximately
320,000 m³. The terminal is subject to the jurisdiction of the Director of the Maritime Office in Szczecin. At the approach fairway to the port, the VTMS Świnoujście Traffic system is in operation.

C.2 Location;

**Terminal coordinates:**

- **Latitude:** 53°55.4’ N (WGS 84)
- **Longitude:** 014°18.0’ (WGS 84)

The above coordinates indicate the position of unloading platform.

**Time zone:**

- GMT + 1 hour Daylight Saving Time starts at the end of March GMT + 2 hours and goes back to GMT + 1 hour at the end of October.
- (Daylight Saving Time starts at the end of March GMT + 2 hours and goes back to GMT + 1 hour at the end of October – detailed dates for respective years are given in ALRS chapter 2.) Please refer to Admiralty List of Radio Signals Vol. 2.

The LNG Terminal in Świnoujście is located in the external port of Świnoujście. The entrance to the external port is located on the eastern side of the approach fairway to the Port of Świnoujście. Minimum width of the approach fairway is 200 m (seabed) to 240 m maximum (seabed) with maintained technical depth 14.5 m.

C.3 Hydrometeorological conditions;

With regard to the prevailing hydrometeorological conditions, the approach fairways to the LNG Terminal in Świnoujście have been divided into 3 sections:

**Section 1.** Anchorage No. 3 (central point of the safe anchoring ground for LNG carriers Lat=54°17.6’N Lon=014°08.1’E), area – 5.31 km² with good holding ground of sand and mud;

**Section 2.** Northern part of the approach fairway between “N-1” buoy and “9-10” buoy pair (width 240 m from N-1 to N-2, 220 m from N-2 to “3-4” buoy pair and 200 m from “3-4” buoy pair to “9-10” buoy pair; distance from “N-1” to “9-10” buoy pair equals to 16.9 Nm);

**Section 3.** Southern part of the approach fairway between “9-10” buoy pair and the external port breakwater heads (width 200 m; distance 7.9 Nm).

**Winds**

The safety of LNG carrier operation at the approach fairway and inside the external port in Świnoujście may be affected by strong and very strong winds. Table C1 presents
the frequency of strong and very strong winds. Figures C1-C3 present prevalent wind directions together with their frequencies.

<table>
<thead>
<tr>
<th>Wind speed [m/s]</th>
<th>% days in a year</th>
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<tr>
<td>$V_w = 10 \div 12$</td>
<td>10.06</td>
</tr>
<tr>
<td>$V_w = 13 \div 15$</td>
<td>2.43</td>
</tr>
<tr>
<td>$V_w = 16 \div 18$</td>
<td>0.45</td>
</tr>
<tr>
<td>$V_w &gt; 18$</td>
<td>0.06</td>
</tr>
</tbody>
</table>

Table C1 Number of days in average year with strong and very strong wind in Świnoujście [Baltic Sea Sailing Directions, data of the Institute of Meteorology and Water Management]

Fig. C1 Average occurrences of wind blowing from respective directions (in days). 1st quarter of the year [Baltic Sea Sailing Directions, data of the Institute of Meteorology and Water Management]
Fig. C1 Average occurrences of wind blowing from respective directions (in days). 2nd quarter of the year [Baltic Sea Sailing Directions, data of the Institute of Meteorology and Water Management]

Fig. C3 Average occurrences of wind blowing from respective directions (in days). 3rd quarter of the year [Baltic Sea Sailing Directions, data of the Institute of Meteorology and Water Management]

Wave motion
The maximum wave height has been indicated separately for the following sections of the fairway and boundary wind speeds:

- section 1: $h_w = 2.5 \text{ m}; l_w = 70 \text{ m} (V_w = 25 \text{ m/s})$
- section 2: $h_w = 1.0 \text{ m}; l_w = 60 \text{ m} (V_w = 10 \text{ m/s})$
- section 3: $h_w = 0.6 \text{ m}; l_w = 50 \text{ m} (V_w = 10 \text{ m/s})$
Water level
Minimum water levels at the approach fairway and in the external port of Świnoujście:
- section 1: $Z = 480$ cm
- section 2: $Z = 470$ cm
- section 3: $Z = 450$ cm
- Świnoujście external port: $Z = 400$ cm – maneuvering
- Świnoujście external port: $Z = 375$ cm – berthing

The water levels indicated above are only reference levels compliant with the "Amsterdam 500 - NAP" system.

Density of water at berth
Density of water is subject to seasonal change. In general goes higher during the winter months. Typical density is around $1.004 \text{ t/m}^3$ or higher.

Currents
The sea current conditions in the Świna strait depend mainly on the character and magnitude of water level changes and their mutual relationships in the Pomeranian Bay and Szczecin Lagoon. The wind indirectly acts on the currents by impacting the water level in the bay, whereas it is of little influence on the surface currents.

Considering the above, maximum current velocities have been determined:
- section 1 and 2: $V_p = 0.0$ kts
- section 3: $V_p = 0.5$ kts
- between "15-16" buoy pair and port entrance breakwater heads: $V_p = 1.0$ kts

Visibility
Frequency of good visibility (>5 NM), average values for subsequent months and poor visibility (0.5 NM ÷ 2 NM) is presented in Fig. C4
Fig. C4 Average frequencies of visibility of >5 NM and average frequencies of visibility 0.5 NM ÷ 2 NM

Ice presence

Analyzing the ice conditions in the Pomeranian Bay, following may be adopted:

- Section 1: no ice presence;
- Section 2 and section 3 from KP 10.0: no ice presence;
- Section 3 between port entrance breakwater heads to KP 10.0:
  - average number of days with ice presence: 10,
  - maximum number of days with ice presence: 70,
  - average ice cover thickness: 15 cm,
  - maximum ice cover thickness: 35 cm,
  - period of possible ice presence: from end of November to end of February.
- external port in Świnoujście:
  - average number of days with ice presence: 40,
  - maximum number of days with ice presence: 70,
  - average ice cover thickness: 15 cm,
  - maximum ice cover thickness: 35 cm,
  - period of possible ice presence: from end of November to end of February.

C.4 Charts and nautical publications:
Available publications Admiralty Paper Chart and Vector Chart as well as the Hydrographic Office of the Polish Navy (BHMW) Charts:

<table>
<thead>
<tr>
<th>Map number</th>
<th>Title</th>
<th>Scale / comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>UKHO 2676</td>
<td>Szczecin and Świnoujście</td>
<td>1:10000</td>
</tr>
<tr>
<td>UKHO 2677</td>
<td>Szczecin Lagoon – Northern Part</td>
<td>1:35000</td>
</tr>
<tr>
<td>UKHO 2679</td>
<td>Pomeranian Bay</td>
<td>1:75000</td>
</tr>
</tbody>
</table>
Sailing Directions: NP19 Baltic Sea

Hydrographic works interval and bathymetry checks within the approach fairway to Port of Świnoujście and in the external port – not less than twice a year. Additional bathymetric studies shall be carried out after violent storms. Hydrographic works interval and bathymetry checks within the external port basin – not less than twice a year.

Scope of hydrographic works can be found in Regulation of Minister of Transport, Construction and Maritime Economy from the 10th of May 2013 (Rozporządzenie Ministra Transportu, Budownictwa i Gospodarki Morskiej z 10 maja 2013r.). The supervision over dredging and hydrographic works on the abovementioned areas is exercised by the Director of Maritime Office in Szczecin.

C.5 Requirements concerning tugs

The tug assistance shall be provided by a tugboat company contracted by the terminal user.

According to the Port Regulations Chapter XII, the following number and bollard pull parameters of tugs are required:

During the entrance or departure of the LNG carrier as well as maneuvering within the basin of the External Port in Świnoujście, assistance of a minimum of four tugboats shall be mandatory. Two of these tugboats shall be of a bollard pull of at least 80 tons each and the remaining two – of at least 45 tons each.

During the stay of the LNG carrier at the LNG terminal, assistance (passing towing lines not necessary) shall be provided by at least two tugboats of combined bollard pull of at least 160 tons. At least one of the tugboats used shall be of a bollard pull of at least 80 tons.
The required composition of the tugboat group, apart from those listed above, shall be supplemented with an additional tugboat of bollard pull of at least 45 tons which shall constitute a back-up vessel ready for immediate deployment for the maneuvering operation should any of the basic tugboats fail.

The tug assistance for the LNG carrier entering the External Port in Świnoujście shall be as follows:

1) within the section of the approach fairway at a position located 1 NM north of "1-2" buoy pair and during emergency stoppage within the emergency maneuvering basin – one tugboat with bollard pull of at least 80 tons shall be used to provide passive assistance as well as one tugboat with bollard pull of at least 80 tons providing active assistance with connected stern tow;

2) within the section of the approach fairway between "13-14" buoy pair – two tugboats with bollard pull of at least 80 tons each shall be used to provide active assistance with connected stern and bow tow;

3) from "15-16" buoy pair onwards – four tugboats shall be used to provide assistance as in point 2) above and the remaining tugboats assisting in the manner ordered by the pilot in consultation with the LNG carrier Captain.

The tugboat assistance for the LNG carrier departing the External Port in Świnoujście shall be as follows:

1) Two tugboats shall be of a bollard pull of at least 80 tons each and the remaining two – of at least 45 tons each – as far as "15-16" buoy pair;

2) with two tugboats with combined bollard pull of at least 160 tons – as far as "9-10" buoy pair;

3) with a single tugboat with bollard pull of at least 80 tons – as far as "5-6" buoy pair on the approach fairway and during the emergency stoppage within the emergency maneuvering basin;

4) in the manner executed according to the instructions of the pilot in consultation with the LNG carrier captain.
Fig. C.5 Tug assistance during entrance to the port
Fig. C.6 Tug assistance during departure from the port
C.6 Requirements concerning fire-fighting ship

According to Port Regulations (§ 182) LNG carriers are obliged to use fire-fighting ship attendance. The fire-fighting ship must be suitable for assisting LNG carriers.

Fire ship must attend LNG carrier:
- During her movement on the approach fairway from 13 – 14 buoy pair to external port in Świnoujście.
- During berthing and unberthing.
- During the vessel stay at berth.

The fire ship attending moored LNG carrier must be ready for immediate action in the vicinity of LNG carrier.

One of the tugs may assume the role of fire-fighting ship (reserve unit described in § 188 point 3 of Port Regulations) if she is FiFi1 class, has parameters described in § 180 point 1 and additionally manned with professional fire fighters from the rescue unit of the Port Fire Service ("Portowa Służba Ratownicza).

The responsible for fire-fighting equipment, crew training and fire-fighting assistance is hold by the fire unit commander on board the fire ship.

C.7 Requirements concerning the notification of arrival of the LNG carrier at the terminal

The vessel captain shall be obliged to deliver the documentation of the vessel, crew and cargo allowing for entrance to the Port in accordance with the requirements of the Port Regulations and pursuant to the provisions set out in Section E.3 herein. It is recommended to liaise with a shipping agent to determine the list of currently required documents.

Part of the documents, such as Notification of Departure from the Port of Loading and Notification of Arrival, can be found on the website of PLNG S.A. www.polskielng.pl. The information which must be provided in the above documents refer, among other, to the port of loading, LNG quantity, its chemical composition, pressure in the cargo tanks, etc. The specimens of the above documents constitute Appendices Nos. 6 and 7 of this instruction. Required and acceptable LNG spec. can be found in Terminal Manual available on Operator’s website www.polskielng.pl and in the table below.
<table>
<thead>
<tr>
<th>Component</th>
<th>Acceptable LNG specification range</th>
</tr>
</thead>
<tbody>
<tr>
<td>C1 (%mol)</td>
<td>87 - 95.4</td>
</tr>
<tr>
<td>C2 (%mol)</td>
<td>3.2 - 8.37</td>
</tr>
<tr>
<td>C3 (%mol)</td>
<td>0 - 3</td>
</tr>
<tr>
<td>iC4+nC4 (%mol)</td>
<td>0 - 1.2</td>
</tr>
<tr>
<td>nC5 (%mol)</td>
<td>0 - 0.23</td>
</tr>
<tr>
<td>N2 (%mol)</td>
<td>0.2 - 1.4</td>
</tr>
</tbody>
</table>

In accordance with the Terminal Service Manual available on www.polskielng.pl website, the Terminal User shall ensure that upon departure of the LNG Carrier from the Port of Loading and no later than 24 hours of such a departure the Terminal Operator is provided with the Notice of Departure along with all information pertaining to the LNG Carrier which may be of relevance for the operations performed in the Port of Unloading.

The most important information for the terminal operator is as follows:

1. Name and call sign of the vessels
2. Captain’s name
3. Arrival draught
4. Cargo volume to be unloaded
5. Last port of call
6. ISPS pre entry checklist
7. Crew list
8. ETA
9. Confirmation of compliance of temperatures and pressures in the cargo tanks

In practice, this comes down to filling in and forwarding the forms of Notice of Departure from the Port of Loading and Notification of Arrival included respectively in Appendix No. 6 and No. 7 herein.

Notice of Departure from the Load Port shall be submitted to the Terminal Operator not later than 24 hours of departure from the Port of Loading.

Notification of Arrival shall be submitted not later than 7 days before the LNG Carrier’s arrival at the Port of Świnoujście roadstead. An update of ETA time is required at this stage if the change in the expected time of arrival exceeds 12 hours.
Subsequently, 96 h, 72 h, 48 h, 24 h, 12 h and 6 h before arrival, the LNG Carrier shall provide the Estimated Time of Arrival (ETA) in concordance with the table below:

<table>
<thead>
<tr>
<th>Time of submitting the Notification of Arrival</th>
<th>Change of the Estimated Time of Arrival (ETA) requiring the Notification of Arrival update</th>
</tr>
</thead>
<tbody>
<tr>
<td>7 days before arrival</td>
<td>12 hours</td>
</tr>
<tr>
<td>5 days before arrival</td>
<td>6 hours</td>
</tr>
<tr>
<td>96 hours before arrival</td>
<td>6 hours</td>
</tr>
<tr>
<td>72 hours before arrival</td>
<td>3 hours</td>
</tr>
<tr>
<td>48 hours before arrival</td>
<td>3 hours</td>
</tr>
<tr>
<td>24 hours before arrival</td>
<td>any change</td>
</tr>
<tr>
<td>12 hours before arrival</td>
<td>any change</td>
</tr>
<tr>
<td>6 hours before arrival</td>
<td>any change</td>
</tr>
</tbody>
</table>

All above Notifications shall be submitted by the ship’s Master or by authorized person on his behalf. Furthermore, pursuant to the provisions of the LNG Terminal Code, the Terminal User shall ensure that each latest Notification of Arrival includes information on safety and technical condition of the LNG Carrier by completing relevant sections of the Notification of Arrival included in The Marine Operations Manual.

The notifications mentioned above shall be forwarded at the following address: notifications@polskielng.pl - receipt will be confirmed by Terminal Operator.

Apart from the above Notifications the Terminal User is obliged (according to “Terminal Code”) to deliver Loading Certificate.

Loading Certificate shall be sent to Terminal Operator not later than 48 hours after departure from load port either directly by Terminal User or by agent by email to: notifications@polskielng.pl - receipt will be confirmed by Terminal Operator.

According to Terminal Code Loading Certificate shall include:

- cargo reference number,
- vessel’s name,
- date and time of departure from load port,
- name of loading terminal,
- estimated time of arrival,
- volume, density and energy (kWh) of cargo on departure from load port,
- estimated volume, density and energy (kWh) of cargo on arrival to port of Świnoujście,
- Bill of Lading,
- Quality certificate of with cargo specification detailed
- Certificate of Origin,
- Cargo Manifest.

For detailed information on commercial aspects of the vessel’s arrival, such as arrival timeframe, unloading timeframe, principles governing the tendering of the Notice of Readiness, activities preceding the unloading operation as well as estimation of the volume of unloaded LNG please refer to complete contents of Chapter 7 in the Terminal Code available on www.polskielng.pl

PLNG S.A, as the Operator of the LNG Terminal in Świnoujście is in no way liable, does not participate or intermediate in the communications between the LNG Carrier and port’s administration i.e. control services of port authority and VTS. In spite of this, in order to ensure the completeness of the Marine Operations Manual, the requirements and the manner of communication between the LNG Carrier and port administration were described in Section E.3 herein, including the references to Chapter 3 of Port Regulations and ALRS vol. VI.
D. **Terminal safety regulations and policy**

Polskie LNG S.A. as the operator of the terminal is also, within the meaning of the Port Regulations, the user of the berth and is responsible for ensuring safe berthing and unloading of an LNG carrier at the terminal. The detailed scope of responsibility and berth user roles in ensuring safe port operations are specified in the Port Regulations, Port Facility Security Plan, Internal Emergency and Rescue Plan, this manual and other documents.

D.1 **Restricted access zone around the LNG carrier.**

The operator of the LNG terminal in Świnoujście has established a restricted access zone around the LNG carrier berthing at the terminal. It is defined in the Port Facility Security Plan and corresponds with the hazard zone identified by quantitative risk analysis for the marine part of the LNG Terminal. Radius of the restricted access zone stretches 200 m from the manifold connection between the LNG Carrier and the unloading arms of the plant. The entrance to the external port basin during the stay of the LNG carrier at the berth shall be constantly monitored by the terminal personnel and Polish Coastguard patrol unit – in accordance with the Port Facility Security Plan.

D.2 **Consequences of breaching the terminal security rules**

During the entire period of stay of the LNG carrier at the terminal, the entire ship crew and visiting persons shall be obliged to fully adhere to the security rules of the LNG Terminal specified herein, Terminal Internal Rescue and Operation Plan and Terminal Emergency Response Plan. The Captain and crew of LNG carrier will be familiarized with the key aspects related to safe stay of the ship at PLNG Terminal prior to commence cargo operations Failure to comply with these regulations may result in consequences including expulsion of personnel from the terminal. Additionally, persistent breaching of the security policy rules may result in instigation of the proceedings by the Marine LNG Terminal operator against the ship, including the withholding of unloading operations and, in extreme cases, expulsion of the ship from the terminal. The terminal operator and users shall bear no financial responsibility for any activities resulting from the repair of failures caused as a result of ship personnel's breach of the terminal security rules.
D.3 Reference to the health and safety and environmental protection rules in force at the terminal

Environmental Protection
The oils and oil-contaminated water must not be discharged from the ship on the waters of the Pomeranian Bay. During the stay of the LNG carrier at the berth, internal fuel transfer operations shall be forbidden. Any spills must be immediately reported to the terminal operator and to adequate services (Duty Officer of the Port Authority and VTS).

Collection of oil-contaminated waste and garbage
Collection of oil-contaminated waste and garbage is possible at the LNG terminal only from the off-shore side according to rules set out in item F11.

Information concerning the system of waste disposal in the Ports of Szczecin and Świnoujście:
The system of waste collection from the ships is mandatory which means that all facilities operating within the sea port in Szczecin and sea port in Świnoujście, as well as ships using the berths located in both ports are obliged to comply therewith. The above system does not apply only to the inland water vessels.
In accordance with the regulations of the Minister of Infrastructure of December 21, 2002 on management plans in ports for waste and cargo residues from ships. (Journal of Laws No. 236, item 1989 of 2002). ZMPSiŚ S.A. developed the "Waste and ship cargo residue management plan in the sea port of Szczecin" and "Waste and ship cargo residue management plan in the sea port of Świnoujście". The plans have been agreed with the port users and approved by the Zachodniopomorskie Province Governor by virtue of a decision issued for the sea port management of Szczecin and Świnoujście. The plans which constitute the basis for operation of the system for waste collection from ships are available at the Environmental Protection and Health and Safety Department of ZMPSiŚ S.A. and on ZMPSiŚ website: www.port.szczecin.pl.

Manifolds not used during unloading
The manifolds which are not used for unloading or BOG return must be blinded and their valves (ESD, by-pass/cooldown and doubleshit) must be closed.

Cargo vapors
Inside the port, discharge of cargo vapors into the atmosphere is forbidden.
Preventing environmental pollution

In accordance with the MARPOL convention and SECA Zones legislation all LNG carrier ships on their way to the terminal and at the terminal must have used fuel with sulfur content below 0.1% vol. in the Baltic Sea.

Bunkering

In general, bunkering during the stay of the ship at the terminal shall be forbidden. It shall be allowed only in exceptional cases, based on the rules specified in item F8.

Inerting purging and venting of the cargo tanks

Operations other than those stipulated in this manual shall be forbidden during the stay of the LNG carrier at the berth.

D.4 Reference to safety regulations and checklists (ISGOTT 5th edition)

The entire personnel involved in the LNG loading operations must be familiarized with the information contained in the following publications and industry standards:

- Regulation No. 3 of the Director of the Maritime Office in Szczecin of 26/07/2013 "Port Regulations" (Latest English version available on www.ums.gov.pl)
- International Code For The Construction And Equipment Of Ships Carrying Liquefied Gases In Bulk (IGC Code). Resolution MSC.30(61), Resolutions MSC.32(63) and MSC.59(67)
- The International Ship and Port Facility Security Code (ISPS Code)
- SIGTTO - Liquefied Gas Handling Principles on Ships and in Terminals - 3rd edition (April 2000)
- SIGTTO - LNG Operations in Port Areas (September 2003)
- SIGTTO Training of Terminal Staff involved in Loading and Discharging Gas Carrier (1996)
- OCIMF Marine Terminal Management and Self-Assessment (MTMSA)
- OCIMF Marine Terminal Particulars Questionnaire (MTPQ)
- OCIMF Marine Terminal Operator Competence & Training (MTOCT)
The Marine LNG Terminal of PLNG S.A. in Świnoujście applies all safety rules and practices specified in the current issue of ISGOTT (5th edition). The checklist and safety check-line shall be in compliance with the ISGOTT checklists. Failure to comply with the rules and practices contained in ISGOTT shall result in consequences described in chapter D.2.

D.5 Rules concerning the persons visiting the ship

The terminal shall ensure safe connection between the ship and the terminal. The terminal shall ensure also adequate security measures against access of unauthorized persons also within the area of the LNG terminal and jetty. It is expected that the ship will ensure own security measures against access of unauthorized persons from the ship sides in accordance with the ISPS code. The terminal normally operates at level 1 – in accordance with the ISPS code. Implementation of level 2 or 3 shall be communicated to the ship in advance – during information exchange between the ship and terminal.

The ship should maintain constant observation and report presence of any unidentified vessels in the port basin and notify the terminal security service of this fact. If a need arises, the terminal operator shall take actions to ensure safe stay and unloading of an LNG carrier during its stay at the berth.

Based on the regulations of the International Ship and Port Facility Security Code (ISPS), the area in which the Terminal is located is classified as a “Restricted access area” which means that the vessels present at the terminal are required to comply with security and safety regulations in accordance with the regulations of the aforementioned Code.

Visiting of the ship by persons from outside is permitted only subject to the terminal loading master’s consent. All visiting persons must be equipped, as a minimum, with a hard hat, safety goggles, long trousers and upper body garment covering their arms. Also antistatic coverall must be worn on top of casual clothing (including standard – non antistatic & fire retardant boiler suits). Visiting persons must be accompanied at the terminal at all times. The ship crew list and list of authorized / visiting persons should be delivered by the ships agent to the terminal security personnel and be available at the gangway.

In accordance with the Port Regulations, the officers of the Port Authority are authorized during their duty to enter the ships, yards, storage facilities and other port facilities for inspection of compliance with port regulations.
The berth user (terminal operator) shall be obliged to provide the Port Authority officers with access to ships, yards, storage facilities and other port facilities for inspection of compliance with port regulations. The access of the Port Authority Officers shall be at all times possible from the side of the land. The access from the side of the water shall be possible provided that there is no interference with loading operations carried out at a given time.

Crew changes are possible, provided that all customs, border and administrative requirements have been met and minimum PPE rules are adhered to.

Within the marine part of the terminal, it is strictly forbidden to use mobile phones, pagers and other equipment not meeting the requirements of the ATEX directive in the scope of spark resistance. Should the Port Authority officers fail to have UHF radios with adequate certification, they shall be provided by the terminal operator.

D.6 Terminal drug and alcohol policy

LNG Terminal in Świnoujście has “zero tolerance” policy for drug and alcohol which applies to all personnel working or visiting the terminal. This approach also apply to the crewmembers coming back from shore leave.
E. Procedures of entry into the outer port in Świnoujście – PE-PP-10-1-1

E.1 General information concerning the commercial port in Świnoujście.

The parameters of the approach fairway to the external port in Świnoujście:

- Safe depths of all sections of the approach fairway are as follows:
  - Anchorage No. 3 minimum depth = 15.8 m;
  - all other sections of fairways minimum depth = 14.5 m.
- Safe widths of the approach fairway and system of navigational marks are as follows:
  - between 0.0 Nm (breakwater heads) and 14.5 Nm of fairway b = 200 m;
  - between 14.5 Nm and 19.1 Nm of fairway b > 220 m;
  - between 19.1 Nm and 26.9 Nm of fairway b = 220 m;

The terminal operates 24/7 throughout the entire year. The access to the terminal depends on weather conditions. The final decision on entry to the port and approach to the terminal shall always be made by the ship’s captain and assisting pilots.

For LNG carriers arriving at the terminal in Świnoujście for the first time, entry shall be permitted only during daytime.
The maximum allowed speed of the LNG carrier entering the port at respective sections of the approach fairway and in the VTS zone within the Pomeranian Bay are specified in table E1:

<table>
<thead>
<tr>
<th>Item</th>
<th>Fairway section</th>
<th>Maximum speed [kts]</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>between &quot;N-1&quot; buoy and &quot;9-10&quot; buoy pair</td>
<td>10</td>
</tr>
<tr>
<td>2.</td>
<td>between &quot;9-10&quot; buoy pair and &quot;15-16&quot; buoy pair</td>
<td>8</td>
</tr>
<tr>
<td>3.</td>
<td>between &quot;15-16&quot; buoy pair and within the external port basin</td>
<td>4</td>
</tr>
</tbody>
</table>

Table E1

The maximum allowed speed of an LNG carrier in ballast departing from the Port of Świnoujście, in the area of the roadstead and on the approach fairway, after passing the "15-16" buoy pair shall be 12 knots.

E.2 The approach fairway, available anchorages and rules of their use by LNG carriers

For the LNG carriers arriving at the LNG Terminal in Świnoujście, the assigned route may be divided into two basic sections:

1. Western approach fairway up to "N-1" buoy crossing the territorial sea of Germany east of Ruegen Island between "Arkona" buoy through "Sassnitz" and "SWIN-N" buoy to "N-1" buoy (Lat = 54°17.0´N; Lon = 014°16.4´E). The minimum depth of the basin through which this fairway crosses is 14.5 m.

2. Approach fairway to the Port of Świnoujście between "N-1" buoy to the external port breakwater heads. It is a fairway dredged to the depth of 14.5 m. The approach fairway comprises:
   a. Northern part of the approach fairway between "N-1" buoy and "N-2" buoy and, further, to "3-4" buoy pair (14.5 Nm of the fairway – from the breakwater heads). Its minimum depth of 14.5 m and width of 220 m is ensured, in its majority, by natural basin depths except for the section 14.8 Nm ÷ 16.7 Nm located between "1-2" and "3-4" buoy pairs which is a dredged to 14.5 m fairway (natural depths are in the range of 13.5 m).
   b. The southern part of the approach fairway crossing the Pomeranian Bay between "3-4" buoy pair (14.5 Nm of the fairway) and central breakwater head in Świnoujście (0.0 Nm). It is a dredged fairway with minimum depth of 14.5 m and width of 200 m. In the section between "3-4" buoy pair and "7-8" buoy pair this fairway crosses the basin with natural depths of 13.5 m ÷ 14.5
m, whereas in the section between "7-8" buoy pair and "9-10" buoy pair it crosses a basin with natural depths of 13.0 m ÷ 13.5 m.

The diagram of the approach fairway to Świnoujście together with anchorages, speeds allowed in particular sections of the fairway and under-keel clearance is shown in Fig. E1. The map of the external port in Świnoujście is shown in Fig. E2. Depths of the maneuvering basins, i.e. port entrance, turning basin and approach to the berth, are 14.5 m.
Fig. E1 Diagram of the approach fairway to the outer port of Świnoujście (for reference only)
Source: SKBT
E.3 Communication with Maritime Administration

Pursuant to the LNG Terminal Code, the Terminal User (the entity contracting regasification service and supplying LNG) shall obtain all available information concerning access to the port directly from the Maritime Administration (duty officer of the Port Authority and VTS).

Detailed information concerning the communication with maritime administration is provided in chapter II of Port Regulations (available on www.ums.gov.pl) and in ALRS Vol. VI.

Communication with Maritime Administration shall be managed separately from the commercial communication described in section C.6 of this document. Especially “Notice of Arrival” required by Maritime Administration and “Notification of Arrival” required by Terminal Operator shall be treated as separate documents with different purpose and content.

The ship’s master or an authorized representative of the ship’s master shall be obliged to submit a preliminary notice of arrival at the port authority or VTS in areas in which such system operates.

The preliminary notice of arrival shall be submitted in advance as indicated below:

- not later than 24 hours before the arrival of the ship at the port of destination or before the arrival at the pilot ship boarding point,
- if the ship voyage is shorter than 24 hours – immediately after the ship has departed from the last port,
- if the port of destination has not been known earlier – immediately after the ship’s captain obtains such information.

Together with the preliminary notice, the following information shall be provided:

- contact details:
  - Designated Person ISM;
  - person providing detailed information on the cargo if the ship in question transports hazardous or potentially contaminating cargo;
- details of the hazardous or potentially contaminating cargo in accordance with the rules set out in Section 17 of the Port Regulations;
- ship class according to INF Code, together with Principle VII/14.2 where applicable;
- estimated departure time (ETD) from the port;
- information on total number of persons onboard the ship;
- information on cargo harmfulness category for chemical agents transported in bulk.

Together with the preliminary notice, the ships should provide information on the waste present onboard the ship.
The ship performing regular voyages between the ports of the European Union Member States may be released from the obligations set out in section 1 under separate regulations.

Following documents should be appended to the preliminary notice:
- Passenger List – IMO FAL FORM 6;
- Crew's Effects Declaration – IMO FAL FORM 4;
- Ship's Stores Declaration – IMO FAL FORM 3;
- Crew List – IMO FAL FORM 5;
- Cargo Declaration or Hazardous Goods form – IMO FAL FORM 2 or IMO FAL FORM 7 respectively;
- Maritime Declaration of Health.

The ship's captain or an authorized representative of the ship's captain shall, after arrival, submit the following:
- at the port authority or VTS in areas where this system is in operation, the notice of arrival on IMO General Declaration - IMO FAL FORM 1;
- at the port authority - maritime transport registry form the specimen and application scope of which are specified in separate regulations.

The ship's captain or an authorized representative of the ship's captain shall, prior to departure from the port, submit the following at the port authority or VTS in areas where this system is in operation:
- the departure notification on IMO General Declaration – IMO FAL FORM 1;
- Passenger List – IMO FAL FORM 6;
- Crew List – IMO FAL FORM 5;
- Cargo Declaration or Hazardous Goods form – IMO FAL FORM 2 or IMO FAL FORM 7 respectively;
- Ship's Stores Declaration – IMO FAL FORM 3.

The ship's captain or an authorized representative of the ship's captain shall submit, to the port authority, the maritime transport registry form the specimen and application scope of which are specified in separate regulations:
- not later than 1 business day from the departure of the ship from the port;
- not later than 1 business day after conclusion of a given month – if the form contains collective information for a given month.

The documents and information listed above shall be submitted in the components PRE – ARRIVAL, PSC Notice, IMO FAL (for approval) respectively, of the PHICS system.
In the event of PHICS system failure, the documents and information listed above shall be submitted to the port authority of VTS in areas where this system is in operation, on the forms the specimens of which are defined in separate regulations, in writing, by e-mail or by fax.

**For the needs of vessel traffic and port operations, following rules shall be followed:**

**VTS area Świnoujście:**

1) operational channel: **12 VHF, 70 VHF DSC code 002610800**;
2) call sign: Świnoujście Traffic;
3) area: roadstead, Port of Świnoujście and Świnoujście – Szczecin fairway as far as 2nd Gate ("Brama Torowa");
4) purpose: contact between VTS operator and moving vessels or vessels intending to move;
5) VHF channel 12 shall only be used for communication between VTS and the ship;
6) for the exchange of information between onshore entities and the VTS operator concerning the traffic of vessels on the fairway and their mooring, telephone communications should be used;
7) the entrepreneurs may designate other call channels for their purposes within the assigned frequency ranges;
8) arrangements between the ship and VTS requiring longer time shall be made on VHF channel 18.

**Port of Świnoujście area, for ship mooring and unberthing services;**

1) operational channel: **VHF 17**;
2) area: commercial port areas including the production and ship repair yards;
3) purpose: maintaining communication between the pilot, tugboat, berth (dock) administration, berth master and wharfman;
4) in the event of higher number of simultaneous mooring, unberthing and docking operations, the communication between the ship and the tugboat or other vessels involved in these operations, VHF channel **08** or **06** should be used with observance of the rules specified in radio communications rules and with application of following restrictions:
   a) transmission power should be reduced to **1 W**,
   b) communication should be immediately ceased and moved to a different VHF channel upon receiving information that using the VHF 06 channel interrupts communication in an on-going rescue operation carried out with the use of aircraft.
E.4 Communication between the ship and terminal operator

In accordance with Chapter 7 of the LNG Terminal Code:

The terminal user shall ensure that irrespective of the notification of Carrier’s arrival required under mandatory provisions of law, the captain of the carrier or his agent notifies the Terminal Operator using a relevant form available at the webpage of the Terminal Operator on the following: identification information of a Carrier, Port of Destination, on the time of departure from the port of loading and the estimated time of arrival at the roadstead (hereinafter referred to as “Notification of Arrival”).

Such a Notification of Arrival shall be submitted not later than 7 days prior to the arrival of the Carrier to the Świnoujście PortRoadstead. The Terminal User shall also submit a Notification of Arrival ninety-six (96), seventy-two (72), forty-eight (48), twenty-four (24), twelve (12) and six (6) hours before the arrival of the Carrier to the Roadstead.

Detailed information concerning the communications between the LNG Carrier and the Terminal Operator is provided in Section C.6 of MOM and Chapter 7 of the LNG Terminal Code.
E.5 SSI & Vessel Compatibility Study

The Compatibility Study shall be conducted in compliance with “Authorisation Procedure for LNG Vessels Arriving at the LNG Terminal in Świnoujście” separately for each vessel by a designated representative of the terminal operator. In accordance with the provisions of the LNG Terminal Code:

Only those LNG Carriers will be admitted to arrive and unload which were authorized by the Terminal Operator and for which the compatibility study has confirmed that the Carrier meets all required technical conditions for unloading LNG cargo and proved that the equipment installed thereon is compliant with the mooring equipment and unloading equipment of the unloading berth at the terminal.

The unloading berth allows for unloading of a carrier with cargo tank capacity ranging between 120,000 m³ and approximately 217,000 m³ and total length of up to 315.16 m, width of up to 50 m and maximum draft of 12.5 m fresh water. In the event of positive verification in the authorization procedure, unloading of LNG from carriers of parameters different from those specified above shall be possible.

In accordance with the design of the terminal, the minimum cargo capacity of a LNG carrier shall be 75 000 m³.

Throughout the validity period of the authorization, the Operator shall retain the right to verify the authorization of any carrier, primarily by means of inspections, and to render the maintenance of authorization dependent upon demanded adjustments, particularly in the scope of metering instruments (CTMS). In justified cases, the operator shall be entitled to refuse the consent for unloading from a carrier or stay at the unloading berth or shall be entitled to cancel the authorization.

The approval process of a carrier arriving at the LNG terminal in Świnoujście shall follow the algorithm below which constitutes a part of the "LNG Carrier Approval Procedure for Carriers Arriving at the LNG Terminal in Świnoujście" – PE-PP-10-1-6 which constitutes a separate manual available on the operator’s website www.polskielng.pl.

The complete list of documents required for accomplishing the Carrier authorization procedure is contained in the "LNG Carrier Approval Procedure for Carriers Arriving at the LNG Terminal in Świnoujście" as well as in Chapter 7 of the LNG Terminal Code.
Fig. E4 Authorization algorithm – source: Approval Procedure of a carrier arriving at the LNG terminal in Świnoujście.
E.6  Condition of ship tanks and cargo system upon arrival.

In accordance with the Notification of Arrival (Appendix No. 6), the cargo of the LNG carrier may be checked prior to the arrival at the port where the cargo parameters, namely the saturated vapor pressure of the cargo, must not exceed (must not be higher than) 15 kPa (preferably 13 kPa) gauge respectively. The vessels not meeting these requirements may fail to obtain the terminal operator's consent for mooring. After the arrival at the terminal, the procedure shall follow the provisions of the Terminal Manual. Adequate checks of the loading system must be carried out by the ship's crew (two days checks/one day checks), and their results must be recorded in the Cargo Operations Log.

<table>
<thead>
<tr>
<th>Component</th>
<th>Light (%)</th>
<th>Heavy (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>C1 (%mol)</td>
<td>95,4</td>
<td>87</td>
</tr>
<tr>
<td>C2 (%mol)</td>
<td>3,2</td>
<td>8,37</td>
</tr>
<tr>
<td>C3 (%mol)</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>iC4 + nC4 (%mol)</td>
<td>0</td>
<td>1,2</td>
</tr>
<tr>
<td>nC5 (%mol)</td>
<td>0</td>
<td>0,23</td>
</tr>
<tr>
<td>N2 (%mol)</td>
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<td>0,2</td>
</tr>
<tr>
<td>Density at -159,8°C (kg/m³)</td>
<td>442</td>
<td>470</td>
</tr>
</tbody>
</table>

Table E1 LNG quality parameters required by the operator of the terminal in Świnoujście

E.7 Information on pilot services

**LNG carriers entering the Outer Port in Świnoujście shall be obliged to use the services of two pilots.**

LNG carriers:

1) departing from the port, until the time of leaving the roadstead areas, passing of "N-1" buoy or entrance to anchorage No. 3;
2) anchoring within the emergency maneuvering basin;
3) during their stay at the LNG terminal, shall be obliged to use the services of two pilots.

LNG carriers entering the External Port in Świnoujście shall be manned with 2 pilots:

1) within anchorage No. 3 – from the Carrier’s position;
2) on the way – from a point in the area of "N-1" buoy until mooring at the LNG terminal.
Ordering pilot services shall be the responsibility of the ship’s captain or his authorized representative at the pilot station:
1) for ships entering the port – at least 4 hours before planned time of pilot boarding the ship;
2) for ships departing from the port – at least 2 hours before planned time of ship departure;
2. The order for pilot services should contain:
1) ship name, call sign, flag;
2) ship gross tonnage (GT);
3) ship length overall (LOA);
4) maximum draft in fresh water;
5) estimated arrival time to the pilot boarding ground (ETA);
6) details of the tugboats intended for ship handling;
7) any information concerning the place and manner of ship mooring.

Orders for pilot services shall be placed at the dispatchers in Szczecin or Świnoujście.

By phone: Szczecin: +48 91 432 56 56, +48 604 200 093
Świnoujście: +48 91 321 34 31

By e-mail: stacja@szczecinpilot.pl
stacja-swin@szczecinpilot.pl

Over the Internet: http://www.szczecinpilot.pl/zamawianie

Świnoujście Pilot Station Dispatch Office
Contact Person: Dispatcher
Call sign: Świnoujście Pilot
VHF: channel 68
Phone (24h): +48 91 321 34 31
Fax: +48 91 321 34 31
e-mail: stacja-swin@szczecinpilot.pl

Detailed information on the regulations governing pilot services may be found in ALRS Vol. VI and chapters VI and XII of the Port Regulations.
Requirements concerning pilot equipment in accordance with the IMPA:

**Fig. E5. Pilot Poster**
E.8 "Master/Pilot Exchange" checklist

Captain/Pilot checklist compliant with the maritime administration requirements constitutes an appendix to the port regulations.

LISTA KONTROLNA GOTOWOŚCI ZBIORNIKOWCA LNG ZAWIJAJĄCEGO DO PORTU ZewnęTrzNEGO W SWINOUJSCIU.

[ LNG CARRIER READINESS CHECK LIST]

No. PE-PP-10-1 – Ver. 3.0 Page 42 of 130
E.9 Conclusions of the FMBS

A total number of 14 valid simulation runs were carried out, including emergency maneuvers, and the total net simulation time was approximately 22 hours. Before starting, a number of test runs were done to facilitate adaptation to the maneuvering conditions.

The following conclusions can be drawn from the evaluation and simulation runs taking into account the level of difficulty in executing the maneuvers, the tug requirements and the simulated emergency maneuvers:

**Normal maneuvers:**

- In 10 m/s of mean wind speed, (gusting up to 12.5 m/s), regardless of direction, current up to 1.0 knots, and waves of 1.2 m significant height, the fairway is accessible for Q-Flex LNG carriers. The wind is predominant safety factor.
- Winds of more than 10 m/s knots can slightly hinder maneuvers when wind direction is coincident with outgoing current (wind from W and current veering to E) close to harbour breakwaters’ heads, increasing the drift angle to approximately 5°. The critical area of the channel where the bridge team needs to be more vigilant is between 15-16 buoys and turning basin inside outer harbour, because of channel direction change, shallow water in front of central breakwater and necessity to support by PPU. There is also strict necessity to keep speed below 4kts in the 200m wide channel between breakwaters in order to effectively cope with bank effect. The stopping distance from the entrance to outer harbour to the turning basin is sufficient to stop the vessel within turning basin limits with the maneuver strategy used in the study. No more than half astern was used during stopping maneuver.
- The tug formation comprises two 80t ASD tugs connected by 50m to 100m towing lines at the stern and the bow, and up to three pushing tugs (two active and one in close standby), each of 45 t, which can be connected at the sunken bits starboard/port bow, sunken bit starboard/port quarter and starboard/port stern according to pilots’ wishes. The side where tugs are located is port in normal conditions as the vessel is berthing starboard side after rotation in turning basin. This is sufficient to turn the ship around and move it safely to the terminal in the conditions studied.
- During departure maneuvers the effect of the wind increases compared to that of the arrival due to the ship’s smaller draft and the greater area exposed to the wind. Anyway the 80t tugs can cope that effectively. Departure maneuvers are direct. The tugs separate the ship from the quay and she navigates with their assistance towards the fairway to leave the port. The same tug formation, consisting of four ASD tugs and one additional in standby, is sufficient to
separate the ship from the terminal and keep her under control until passing 15-16 buoys where all the tugs except stern one separate.

Emergency maneuvers:

- All conducted emergency maneuvers have been properly solved using the proposed tug formation, rudder, engine and anchors. The combination of the available means of maneuver were enough to keep the vessel under control and within the fairway and inside outer harbour 14.5m isobath limits.
- Tugs failure during turning maneuver of 80t ASD tug has been assessed (towing line parted or tug broke down in Scenario No. 3 24/02). The power of the remaining tugs was sufficient to control and turn the ship and move her to the terminal in a safe manner Anyway, the power required from tugs was considerably high during prolonged periods of time (they used up to 1x80tx75% and 3x45tx75% simultaneously for prolonged periods of time).
- this case corresponds to an emergency situation, therefore this conclusion cannot be extrapolated to other normal situations.

Tug Requirements:

- The minimum tug formation recommended for Q-Flex vessels at Świnoujście Port is 5 ASD tugs (3 with a bollard pull of 45 tonnes each and two extra with 80 tonnes). During normal maneuvers, 4 tugs have worked simultaneously at 50% of the time for prolonged periods of time, therefore all 5 ASD tugs are required.
- This tug formation results enough for navigation, turning and berthing stages in the conditions studied (mean wind speed of 10 m/s, 1.0 kts current and 1.2 m significant wave height).
- As already commented, the tug fleet considered was capable of solving all emergency maneuvers considered, tugs were capable to stop the vessel, control the vessel and turn the vessel in a safe and controlled way.

Navigable Areas:

- The fairway for the entry at the port is wide and suitable enough for the access of the Q-Flex to the port under the analyzed conditions, even though it has to cope with a certain drift angle which increases the area occupied by the vessel at the fairway. There is strict necessity to use Pilot Portable Unit (PPU) to support navigation especially in the area between 15-16 buoys to the berth where physical ATONs (aids to navigation) are not sufficient.
- The approach channel between breakwaters has width of 200m. The turning basin is an oval shaped (1000m x 600m). The minimum distance to the limits of the 14.5m isobaths inside-breakwaters channel during the simulation was 20m. The minimum distance to the limits of the 14.5m isobath inside turning basin during the simulation was 63m.
• Turning area is sufficient to allow the safe and controlled turning of the Q-Flex under the analyzed conditions.

**Vertical Dimensions (UKC):**
- Taking into account the current limits for the access of LNG carriers at Świnoujście Port (under-keel clearance of not less than 2.0 m is maintained from pair of buoys '9-10' and within maneuvering areas, while taking into consideration water level forecast), the access to the port with Q-Flex fully loaded (T=12.5 m) shows no interferences with the depth of the fairway, and therefore, it is considered safe.

**Aids to Navigation:**
The available Aids to Navigation (AtoN) throughout the Świnoujście approach fairway are as follows:
- 1 leading line,
- 2 sector lights at breakwaters heads,
- 2 IALA pillar mid-channel safety water buoys,
- 14 IALA pillar lateral buoys,
- 2 beacons (11-12),
- 8 special pillar yellow buoys marking anchorage areas.
All this available AtoNs are enough to ensure safe maneuvers except in the area between 15-16 buoys to the berth where PPU assistance is necessary.

**Operational Limits:**
- The maneuvers performed for the assessment of the access of the Q-Flex to Świnoujście Port considered the worst case scenarios within the LNG Terminal limitations for the access of LNG carriers.
- Mean wind speed not more than 12.5m/s in any direction (gusting up to 15m/s);
- Significant wave height not more than 1.5m;
- Current speed not more than 0.5kt (up to 1.0kt locally) in any direction.
These conditions are adequate for the safe access of the Q-Flex towards Świnoujście LNG Terminal

**Recommendations:**
- Pilots considered that in the fairway the most critical wind direction are E and W. They agreed strong wind affects tug assistance when the vessel reduces speed at the port entrance and while berthing at speed - 0kts.
- The necessity to keep speed <4kts in the channel between breakwaters in order to effectively cope with bank effect was reiterated. Monitoring of the ship position close to the fairway axis via visuals and electronic pilot navigation system (PPU) was emphasized by all parties.
• It was agreed that initial three (3) entries of vessel and first departure will be performed during the day light hours.
• The final tug formation of 2x90t, 2x45t, 1x55t is to be confirmed by harbour authorities. All training scenarios have been prepared and performed with 2x80t, 3x45t BP tugs.
• The tug masters confirm their ability to render passive assistance at a speed of 10kts for the channel transit.
• Further training focused in the knowledge of the Pilots / Captains and Tugmasters to:
  • Determine the most effective positions of the available tugs and tug types, taking account of when, where and how tug assistance is required during passage towards the berth, at the berth or when departing.
  • The capabilities and limitations and efficient use of the propulsion and steering control systems of tug types while assisting, and how to respond to propulsion and steering control system failures.
  • The safe maneuvering of tug when passing and releasing the tow lines.
  • The most effective positions for pull and push tugs when required.
  • Effective communication between pilot and tugmaster and correct exchange of information between pilot and tugmaster, and also tugmaster and his crew regarding tug placement, intended maneuvers, towline use, etc.
  • The usage of PPU particularly in emergency situations was recommended.

F. Berth approach, mooring and berthing procedures – PE-PP-10-1-2

F.1 Operational limits of the terminal (permissible carrier parameters)

The LNG Terminal in Świnoujście may receive ship with following maximum parameters:
• Cargo capacity: from 120,000 to approximately 217,000 m$^3$
• Overall length up to 315,16 m
• Breadth up to 50 m
• Fresh water draft – 12.5 m
• Maximum draft during unloading – 13.2 m (including static under-keel clearance equal to 10% of maximum draft)
• Maximum approach transverse speed – 0.05 m/s
• Maximum angle of approach – 2°
• Berth heading - 358°
After conducting compatibility study with a positive result, the terminal operator may allow mooring of LNG carriers with minimum cargo capacity smaller than the described above.

F.2 Maximum allowed hydrometeorological conditions during entrance/departure from the port

VTS may allow an LNG carrier to enter the port, provided that:

- maximum wind speed does not exceed 12.5 m/s,
- wave height does not exceed 1.2 m,
- visibility is not less than 1 Nm (although visibility not less 1.5 Nm on the fairway from buoy pair 11-12 inbound and in port)
- the current speed in the maneuvering basin between the port breakwater heads and "15-16" buoy pair does not exceed 0.5 knot (considered equivalent to speed of 1.5 knot indicated by the meter located at the Świnoujście - Szczecin fairway, at the height of GPK (Border Control Point) berth),
- the water level ensures maintenance of the under-keel clearance not smaller than 2.3 m on the approach fairway to the Port of Świnoujście to "9-10" buoy pair, with consideration of forecast tendencies of water level changes,
- the terminal operator reports the readiness for arrival of the carrier on VHF channel 12,
- the tugboat company providing services for the carrier reports the readiness, composition of the vessel group and tugboat operability declaration on VHF channel 12,
- the weather forecast for the time of the carrier’s port entry maneuver does not stipulate rapid deterioration of weather conditions;

The LNG carrier captain or the pilot on captain’s behalf reports to the VTS the passing of "5-6" buoy pair on the access fairway to the Port of Świnoujście to obtain the consent for continuation of the entry to the port. The VTS shall grant such consent, provided that:

a) wind speed does not exceed 12.5 m/s,
b) wave height does not exceed 1.5 m,
c) the water level ensures maintenance of the under-keel clearance not smaller than 2.0 m from "9-10" buoy pair and in ship maneuvering basins, with consideration of forecast tendencies of water level changes,
d) Visibility on the fairway from buoy pair 11-12 inbound and in port is not less than 1.5Nm.

VTS may allow an LNG carrier to depart from the port, provided that:

a) wind speed does not exceed 12.5 m/s,
b) wave height does not exceed 1.5 m,
c) visibility is not worse than 1.5 Nm,
d) the current speed in the maneuvering basin between the port breakwater heads and “15-16” buoy pair does not exceed 0.5 knot (considered equivalent to speed of 1.5 knot indicated by the meter located at the Świnoujście - Szczecin fairway, at the height of GPK (Border Control Point) berth),  
e) the terminal operator reports the readiness for unberthing of the carrier on VHF channel 12,  
f) the tugboat company providing services for the carrier reports the readiness, composition of the vessel group and tugboat operability declaration on VHF channel 12,  
g) the weather forecast for the time of the carrier’s port departure maneuver does not stipulate rapid deterioration of weather conditions;

F.3 Port Regulations requirements for mooring assistance

Below mentioned requirements are set in Port Regulations as minimum and described for information only. Terminal Operator requirements are more strict and have been described on section F.4.

Berthing and unberthing
All ships of length overall of 50 m and more shall use the assistance of port linesmen. The number of port linesmen servicing a ship depends on the length overall of a ship. For ships of length overall exceed 200:
Berthing – minimum of 6; unberthing – minimum of 5.
Linesmen shall wear personal protection equipment, including life jackets, and work in line with occupational safety and health regulations. During berthing or unberthing, linesmen are managed by a berth user equipped with means of communication with the ship. The user indicates a place of berthing for a ship.
Each linesman shall be trained as regards service provided, based on a training program recommended by the IMO, confirmed by a certificate.
At berths designated for transhipment of dangerous or polluting goods, mooring operations, occupational safety and health and training requirements as regards work provided shall be described in the Berth Safe Operation Instruction.

During berthing or unberthing of a ship a motorboat shall be used if mooring dolphins are not linked with the berth by catwalks or when it is not possible to receive a mooring line from the ship.

Detailed information concerning mooring and berthing regulations may be found in chapter VIII of the Port Regulations.
F.4 Terminal Operator requirements for mooring assistance and berth equipment

In accordance with the requirements of the operator of the LNG terminal in Świnoujście, the linesmen team must comprise at least 12 persons (including the crews onboard mooring boats, at least 3 persons each). Two mooring boats must be used for mooring of an LNG carrier which shall be adjusted for safe transport of two mooring ropes simultaneously.

Apart from training and certificates required by Port Regulations, the linesmen must have completed special training in service mooring infrastructure of the LNG terminal in Świnoujście confirmed by an appropriate certificate issued by Terminal Operator.

The diagram of the LNG unloading berth in the external port in Świnoujście is shown in Fig. F1. This diagram has been developed on the basis of the technical design of the LNG unloading berth. The unloading berth is equipped with:

- 4 type Super Cone Fender berth fenders manufactured by Trelleborg Marine Systems with a 3.5 m x 4.7 m fender plate (allowed mooring impact energy 1,500 kNm);
- 10 dual mooring hooks equipped with a remote mooring hook release system as well as the mooring rope tension monitoring system with a possibility of monitoring from the ship;
- 4 un-loading arms located on the DN400 platform (3 un-loading arms for LNG and 1 for vapor return);
- gangway tower and mobile gangway with the ship movement tracking system;
- 2 remotely-controlled fire monitors.

Fig. F1 Diagram of the berth at the LNG terminal in Świnoujście
LNG Carrier recommended mooring procedure at the terminal in Świnoujście is as follows:

- Parallel approach to the berth to a distance of approx. 1 ship width – lateral speed control by pushing tugboats.
- Springs are lowered to approx. 1 m above water level and taken up to mooring boats – two ropes simultaneously. Spring might also be send one by one. Final decision is to be made by the captain and pilots.
- The mooring boats tow the forward and aft springs to adequate dolphins – the ship’s crew gradually slackens the ropes to allow the mooring boats to maneuver freely.
- The linesmen onshore pass the messenger rope to the mooring boats which is subsequently attached to both springs after which they are hoisted onto the mooring dolphins with capstans and attached in adequate sequence (inboard/outboard) to quick-release hooks. Mooring boats withdraw to a safe distance.
- After correct attachment of springs to the hooks, disconnection of messenger ropes and withdrawal of linesmen to a safe distance, one of the linesmen gives a signal to the officers on maneuvering stations that rope heaving may commence.
- The springs are heaved up and the ship is simultaneously pushed towards the berth. At this stage, particular attention should be paid to transverse approach speed (0.05 m/s limit) shown on the PNDS on the pagers held by pilots and on large shore based display board located in vicinity of MD2 (South). In the final phase of ship approach to the fenders, by skillfully pulling the springs one should ensure that these ropes do not become trapped between the ship side and the fenders.
- After the parallel part of the ship hull becomes resting against the fender devices, its positioning against unloading arms shall commence. The Gas Engineer, maintaining radio communication with the vessel’s captain, and the Loading Master together with the Pilots and directly with the Gas Engineer, acting in a coordinated manner to position the BOG return manifold against the unloading arms and issuing relevant maneuvering orders. The ship shall be positioned according to the spotting line – alignment of symmetry line of the vapor manifold with the BOG return arm.
- When the manifold of the LNG carrier is correctly aligned with respect to the unloading arms, the “in position” communication is issued which shall be confirmed by the ship’s captain. Next, the captain orders "make fast forward and aft springs".
• After fastening of the springs and uncoupling of the spring winches, subsequently the breasts lines, head lines and stern lines shall be handed in the manner described above.
• After handing and making fast of all mooring ropes, the towing lines shall be cast (in some cases, in order to hand the head and stern lines, it is necessary to cast the towing line on the bow and stern before the former are handed).
• After completion of the mooring operation, the crew shall fasten the fire wires from the side of the water, 1 - 1.5 m above water level (in accordance with ISGOTT). If the vessel if fitted with sunken bitts of an appropriate strength, which in case of emergency, allow the tugs to safely connect towing lines then there is no need to use fire wires – if agreed with Pilots and Harbor Master. Abovementioned approach become a standard practice recommended by OCIMF. Decision should be made upon completion of ship shore compatibility study described in LNG Carrier Approval Procedure (PE-PP-10-1-6).
• Upon unberthing, the mooring ropes are slackened and released from hooks in reverse sequence with regard to that during mooring. The linesmen and ship’s crew maintain particular care when casting the mooring lines. The officer at the maneuvering station must not order any given line or rope to be heaved up without clear indication from a linesman that it may be done.
• When casting springs, it is practicable to wait with full slackening until the ropes are fully beyond the contour of the fender devices. This will prevent potential contact between springs and fenders which may pose a hazard to the linesmen.
• Handing the ropes to the mooring lines shall be performed with good maritime practices and with particular care for their crews’ safety.
• The same applies to fastening and casting the tow line – good maritime practices should be observed and all personnel shall realize large forces that act on the tow line and particular care should be maintained.

![Fig. F2 Positioning of the ship at the berth](image-url)
F.5 Berth equipment
The berth shall be equipped with the following devices:
1. 4 loading arms located on the DN400 platform (3 loading arms for LNG and 1 for vapor return), operating range as in appendix J9;
2. Gangway tower with a mobile gangway equipped with a ship movement tracking system – operating range as in appendix J11;
3. 2 remotely-controlled fire monitors;
4. System for indication of approach speed (in cm/s) with mobile displays for pilots and a display board at the berth;
5. Mooring rope tension monitoring system (mobile for the CCR and permanent in the main control room and jetty control room);

F.6 International Shore Connection
The international coupling is located at the bottom of unloading platform and it is equipped with a shut-off valve. The terminal fire water network is always pressurized.

F.7 Taking provisions and stores by the ship
Taking provisions and stores by the ship is possible only from the seaside and requires the terminal operator's consent at all times. The LNG carrier captain should notify the terminal operator (through an agent) on the intention to obtain provisions and/or stores during the stay at the terminal.
Taking of stores and spare parts to the ship must not collide with cargo operations. Prior to such operations, it is necessary to arrange this during the pre-discharge meeting. When the unloading arms are connected and liquid transfer started, it is not allowed for any supply vessels to attach to the carriers side.
The ship's captain, through an agent, shall be obliged to notify the duty officer of the Port Authority and VTS on each planned provision and store taking operation by the
ship, with indication of the involved supply vessel as well as the commencement and completion time of such operation.

F.8 Bunkering
In general, bunkering during the stay of the ship at the terminal shall not be allowed. In exceptional cases, when the ship obtains the consent of the terminal operator to remain for a longer time at the berth and incurs all related costs, bunkering shall be allowed only from the sea side and after disconnection of unloading arms. The ship's master, through an agent, shall be obliged to notify the Duty Officer of the Port Authority and VTS on each planned bunkering operation by the ship, with indication of the involved bunker vessel as well as the commencement and completion time of such operation.

F.9 Repairs
Any repairs that may affect the ship capacity of independent maneuvers are forbidden during the stay of the ship at the terminal. Any exemptions must be agreed with the Terminal Loading Master.

F.10 Managing ballast water
The LNG carrier entering Baltic Sea must replace ballast water in accordance with MARPOL and HELCOM conventions and must have a Ballast Water Management Plan implemented that shall comply with the resolution of IMO - MEPC.127(53) and shall record the ballast water replacement in the Ballast Water Record Book.

The LNG carriers entering the LNG terminal in Świnoujście, due to the amount of cargo they transport, carry only limited amount of ballast water or no ballast water at all. If for any reasons, the ballast tanks are partially filled, it is not allowed to discharge ballast water that has not been exchanged. The ship ballasting procedures during unloading shall take the above principle into account.

F.11 Wastewater and waste disposal rules
The wastewater and waste handing over is allowed only from the side of the water and requires the terminal operator’s consent at all times. The above operations shall not be allowed during unloading. The ship’s captain shall communicate the intention to hand over any waste (including wastewater) in advance. It is necessary to fill in adequate document (though an agent) which constitute appendices to the Waste and ship cargo residue management plan of ZMPSiŚ (Szczecin and Świnoujście Sea Port Authority). The ship’s captain, through an agent, shall be obliged to notify the duty officer of the Port Authority and VTS on each planned wastewater and waste handing operation by the ship, with indication of the
involved vessel as well as the commencement and completion time of such operation.

Necessary documents and forms are available on the website of ZMPSiŚ http://www.port.szczecin.pl

F.12 Shore leave
Crew shore leave shall be possible after all customs, border and administrative requirements have been fulfilled and subject to observance of the ISPS code rules and terminal safety & security regulations. A member of the crew intending to disembark (shore leave) must hold a photocopy of the passport or other ID containing a photograph and, as a minimum, a hard hat, safety glasses, long trousers and upper body garment covering their arms plus anti static coverall on top of casual clothing. All personnel must comply with terminal “zero tolerance” drug & alcohol policy.

F.13 Preparation of the berth for the LNG carrier in winter conditions
Ensuring readiness of the berth for mooring of an LNG carrier in winter conditions shall be the responsibility of the berth owner – ZMPSiŚ (Szczecin and Świnoujście Sea Port Authority). The terminal shift manager or loading master or his authorized deputy, after obtaining the information on berth preparation – snow removal, ice removal of mooring rope handling paths, circulation platforms, crushing of ice in the area of the berth and maneuvering basin – shall check the preparation of the berth.

Ice breaking and winter maintenance of the approach fairway lays fully within Maritime Administration and Seaport Management responsibility. There are two ice breaking tugs available in Port of Świnoujście.
G. Cargo operations – PE-PP-10-1-3

G.1 General information
The chapter below describes the operating procedures related to LNG unloading. The maximum unloading rates that can be received by the terminal is 12,000 m$^3$/hour with connected three unloading arms and BOG return arm. The maximum operating pressure during LNG unloading is 4.5 bar, while the maximum pressure in the BOG return line is 16.5 kPa (165 mBar) which correspond to “high pressure” alarm setting of PIC-12 controller.

The unloading arms, mooring infrastructure (quick-release hooks, capstans) together with the piloting, navigation and docking system and the gangway tower will be tested at least 24 hours (test completion) before the expected arrival of the LNG carrier. The piloting, navigation and docking system shall be started-up 3 hours before the mooring. 2 hours before mooring the nitrogen flow in the loading arm venting system shall be increased from 0.1-0.2 m$^3$/h to 0.4-1.0 m$^3$/h. After conducting the tests of the mooring system together with the PNDS system, obtaining the confirmation of their operability and verification of berth preparation for ship arrival in winter conditions (item F12), the terminal operator, i.e. the berth user within the meaning of the Port Regulations, represented by the shift manager or loading master, shall report readiness to receive the ship to the Duty Officer of the Port Authority and the VTS.

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<tr>
<td>(BOG)</td>
<td>8,000 m$^3$/h</td>
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</tbody>
</table>

Table G1. Design and operating parameters of the unloading arms

Systems tested by the terminal operator prior to the planned arrival of the LNG carrier:
- Gangway tower with the gangway of maximum reach of 22.5 m (above Mean Sea Level) and a shore crane with SWL = 2 tons and maximum outreach of 15 m.
• Jetty Spillage System and Jetty Impounding Basin – located beyond the northeastern corner of unloading platform on the separate installation.
• Fire protection system.
• Fire and gas detection system.
• Emergency Shut Down/Process Shut Down/Unit Shut Down and Local Shut Down systems (activated by the terminal).
• UHF and VHF radio communications system.
• PAGA Intercom internal communication system and CCTV system.
• Ship to Shore Link System – electrical, fiber optic and pneumatic connections.
• Quick-release hook system (hand, local and remote release testing).
• Pilotting, Navigation and Docking System (PNDS) together with environmental monitoring system.
• Terminal lighting.
• Cargo sampling system, laboratory and online chromatograph (field operator or laboratory technician task).

G.2 Supervision over the operation and division of responsibilities

For the needs of this chapter, following definitions of positions and responsibilities during the LNG carrier unloading operation have been adopted:

• "Loading Master" shall be the persons designated by the terminal operator who shall be responsible for the management of LNG unloading operation. It is an employee of the terminal operator.
• "Ship Duty Officer" shall be a Chief Officer of the LNG carrier or a person thereby appointed as the contact person competent in all operations related to LNG unloading. Ship Duty Officer shall be the Loading Master's counterpart onboard the ship.
• The LNG carrier Captain shall be the person with overall responsibility for ship safety both during port entry and mooring. The captain shall also be overall responsible for ship safety during the stay at the terminal.
• "LNG carrier Pilot" is a person holding necessary marine qualifications, knowledge and experience in the scope of safe maneuvering of LNG carriers and additionally the scope of qualification requirements for marine pilots – specialist training on the FMBŚ simulator for the Świnoujście external port approach for a given class of LNG carriers evidenced by a relevant certificate. He acts as an advisor to the ship Captain and acting in full cooperation with the Captain, he ensures safe entry to the port, approach to the berth and mooring. The pilot's responsibility is regulated by law.
• "Tugboat Captain" is a person responsible for safety of the tugboat assistance operations. He works under the supervision of the Pilot and LNG carrier's Captain.
- "Mooring Foreman" is a direct superior or linesmen who coordinates their work. He takes orders directly from the Pilot and LNG carrier’s Captain.

- "Panel Operator (DCS Operator)" is a person supervising the unloading operation from the jetty control room and/or main control room. He is an employee of the terminal operator and works under supervision of a Shift Manager and a Loading Master (during unloading operations).

- "Field Operator (Operator)" is a terminal employee performing activities necessary for controlling the process at the field. He works under the supervision of the Duty Panel operator and Shift Manager, and in the marine part of the terminal – also supervised by an Loading Master.

- Shift Manager is the superior of panel operators and field operators who supervises unloading and storage operations as well as LNG regasification process from the main control room. He is an employee of the terminal's operator and works under the supervision of the Terminal Operations Manager and, for the time of LNG unloading operation, also under the supervision of the Loading Master especially in case of any marine emergencies.

- The term "Terminal" shall mean a Loading Master or persons within his scope of responsibility or working under his supervision, the term "LNG Carrier" shall mean a Chief Officer / Duty Officer of a carrier or persons in the scope of his responsibility and the term "Pilot" shall mean the pilot of the LNG Carrier.

All activities described in this section shall be carried out in close coordination between the Terminal and the Ship.

When the LNG carrier is moored at the berth, the responsibility for the safety of unloading operation shall be on the part of both the ship and the terminal. On the part of the ship, the supervision over the unloading operation shall be performed by the Chief Officer and, on the part of the terminal, the Loading Master and Shift Manager. When the ship is positioned at to the berth, her manifold and terminal unloading platform must be constantly manned and monitored by trained personnel. On the part of the ship, this is the cargo watch, while on the part of the terminal, this shall be the operators of unloading arms.

Duties of the panel operator and field operators include the following activities:

- **Making sure that the ship/terminal connection ensures safe course of the unloading operation;**
- **Checking the condition of unloading arms;**
- **Checking the condition of unloading pipelines (according to a separate manual);**
- **Making sure that no LNG leaks or excessive BOG emission presence occur.**

Checking the safety of the LNG unloading operation at the berths and in the area of the ship’s manifold as well as monitoring of the forces acting on the ship’s mooring system shall be carried out from the jetty control room with the use of the camera.
system and the Smart Hook system which is a part of the Integrated Maritime Navigation Safety System. Maximum and minimum load on particular mooring lines are determined by individual Optimoor analyses and they are communicated during the pre-discharge meeting.

Monitoring of hydrometeorological conditions by the terminal shall be ensured by the environmental monitoring system (WXT520, Aandreaa DCS-4100, WTLS) included in the scope of the integrated monitoring system. The shift panel operator or a person indicated by the shift manager is obliged to monitor from the main control room and/or jetty control room the parameters such as: wind speed and direction, atmospheric precipitation and pressure, temperature, air humidity, current speed and direction, tide level and wave action parameters – all the above information is provided by the systems installed at the terminal. The shift panel operator or the persons indicated by the shift manager shall immediately inform the shift manager and loading master and directly the ship duty officer on occurrence or a risk of occurrence of boundary conditions requiring the LNG unloading operation to be ceased. The ship duty officer shall immediately inform the captain and the pilot onboard the LNG carrier of such fact while the pilot and/or captain shall notify the Duty Officer of the Port Authority and the VTS. The ship duty officer shall also be obliged to monitor the wind parameters from the Cargo Control Room. In the scope of activities to be taken in the event of boundary conditions by the shift panel operator or a persons indicated by the shift manager, the deciding person shall be the Loading Master acting in consultation with the ship's Captain.

G.3 Gangway positioning
When the ship is moored safely a qualified employee of the terminal (field operator) shall lower the gangway onboard of the LNG carrier. The members of the ship's cargo watch and terminal's shift make sure together that the gangway and the gangway tower is correctly illuminated during night time. Shore gangway is located 24,40 m forward of the spotting line. For starboard side alongside the gangway will be landed forward of the manifold.
Schematics and parameters of the gangway tower and the gangway also the range and SWL of the crane are given in appendix 11 to this manual.

After Gangway safely positioned ESD system cable (electrical, optical or pneumatic) is passed to the ship and it shall be connected to a correct socket on the LNG carrier by a member of her crew. During the connection, the ESD system switch shall be in “off” position. It shall be switched to “on” position after making sure that the cable has been correctly attached to the ship’s socket.
At this stage, a member of the LNG carrier shall switch on the water curtain.

G.4 LNG unloading procedure and pre-discharge meeting
Before the LNG unloading operation. A pre-discharge meeting is held onboard the ship. The meeting objectives are as follows:

- Confirmation of the unloading schedule and pumping rates.
- Exchange of any required information concerning the system and equipment of the Ship and the Terminal.
- Arrangement of all cargo data and requirements concerning the unloading.
- Arrangement of the D1011-PIC-12 BOG vapor return controller set point.
- Discussion on draining/purging methodology.
- Discussion on CTMS requirements.
- Carrying out of a safety inspection onboard (by the Loading Master or a person indicated by him and Carrier’s Duty Officer or a person indicated by him) confirming that all safety requirements have been met, before the commencement of unloading operation.
- Filling of a “Ship/shore safety checklist” or an equivalent document.
• Filling a pre-discharge agenda checklist

The meeting shall be attended, on the part of the ship, by the ship captain (recommended) and chief officer (mandatory), while on the part of the terminal, the Loading Master. The suggested meeting agenda and, at the same time, the pre-discharge meeting checklist constitutes an appendix to this manual.

During the pre-discharge meeting, the ship's captain shall sign the information letters of the terminal operator concerning the safety and environmental protection as well as ISPS statement (in accordance with International Ship and Port Facility Security Code) if not signed before arrival.

In turn, the senior officer together with the terminal loading master shall fill in the SSSCL according to their best knowledge, experience and filling instructions contained therein. The SSSCL constitutes an appendix No. 2 to this manual. Periodical checks of all items which, in accordance with code "R", require such activity, shall be carried out at least every 4 hours.

Wind speed boundary conditions (operability conditions) for the LNG unloading operation are as follows:

- Unloading stops > 15 m/s
- Disconnection of unloading arms > 17,5 m/s
- *Consider Unberthing > 20 m/s
- Operation resumes < 15 m/s

Other cases resulting in the necessity to stop the unloading operation:

- Fire or spill at the LNG carrier.
- Fire or spill at the terminal.
- Uncontrolled movement of the ship with regard to the berth.
- Exceeding of the operating range of the unloading arms – activation of ESD 1.
- Activation of ESD 2.
- Any other circumstances which affects safety if Loading Master decide so, in consultation with ship’s Captain.

*If the environmental conditions persist, Vessel Master and loading Master to discuss with the O/B Pilot on the need to depart the berth and shift to the contingency anchorage (turning basin) with the supporting tugs in attendance.

In each case, the stopping of the unloading operation, disconnection of arms, emergency unberthing and resumption of operations shall be decided by the Loading Master in consultation with the ship’s Captain.

Notice of Readiness
In accordance with the Terminal Manual, the Notice of Readiness may be tendered after obtaining the consent of entry of the ship to the port from the maritime administration (VTS) at the earliest. NOR is usually accepted by the Terminal Operator at “all fast”.

G.5 Connection of unloading and BOG return arms
After filling in of the SSSCL (or during this activity, after necessary arrangements for respective checklist items) the authorized representative of the terminal operator (Loading Master) in consultation with the Carrier’s senior officer shall issue a consent to connect the unloading arms. Connection shall be carried out after the arm operators have made sure that no contamination is present inside the manifold and that the ship crew has correctly installed adequate unloading filters (60 mesh strainers). The arm operator shall position it adequately in front of a respective manifold. The arm shall be stopped at a distance of several dozen centimeters from the manifold, after which the blind flange shall be removed. After this operation, the unloading arm shall be connected to the ship manifold with a quick connect / disconnect coupler (QC/DC). This activity shall be repeated for subsequent unloading arms and the BOG return arm. The gaskets are supplied by the terminal. In principle, the first arm to be connected is the BOG return arm. BOG return arm is also the last arm to be disconnected.

G.6 Leak test and pressure test
In order to ensure optimal coordination, this procedure must be performed for all arms one after another and reported to the Ship. The proposed sequence of the operation is intended to optimize nitrogen consumption with the leak test being performed in first line and followed by N2 purging. The nitrogen pressure in the unloading arms shall be increased to approx. 5.0 Bar and in the BOG return arms to approx. 2.0 Bar to carry out the connection tightness test - in practice, it is performed by the ship’s Gas Engineer together with the arm operator using a special liquid. The pressure is subsequently released by relief valves located on the unloading platform of the terminal and on the LNG carrier manifold. The purging activity shall be repeated until O2 concentration of less than 1% by volume is achieved which must be measured and confirmed by the ship’s Gas Engineer with a relevant detector.

G.7 Preliminary CTMS measurement.
The preliminary CTMS measurement should be performed before the warm ESD test and before unloading arms cooldown. During the commencement of the CTMS measurement, all valves of the manifold must be closed. The measurement shall be carried out in the presence of a Chief Officer, authorized terminal representative and an independent surveyor – appointed under an agreement between the ship owner/operator, terminal operator and terminal user. Correct measurement shall be performed with the use of adequate software of the main CTMS system installed on the LNG carrier. It is required to maintain the back-up system operational as well at
that time. The CTMS calibration system certificate and the tank gauging tables should always be available onboard. The CTMS system printout shall be signed by a chief officer, authorized terminal representative (Loading Master) and independent cargo surveyor.

If the ship utilizes BOG to supply the engine, it shall meet the requirements of Annex VI of the MARPOL convention and shall be able to switch from combustion of gas to combustion of conventional fuel. The amount of gas combusted between the preliminary and final CTMS measurement must be calculated and given together with the amount of cargo that has been unloaded. The procedure for measurement of gas combusted in the engine shall be agreed between all parties.

The re-liquefaction plant (if installed) may be kept in operation during initial and final CTMS, this must be taken into account in cargo calculations.


G.8 BOG handling system configuration

Free flow of cargo vapor BOG shall take place between the ship and the terminal. It results from the difference of pressure which is created as a result of LNG level changes in the ship’s and terminal's LNG storage tanks. The valves on the BOG return line from the terminal may be opened only after the preliminary CTMS measurement has been completed, but this depends on the BOG pressure in ship tanks which must be recorded during the pre-discharge meeting. The BOG vapor return valve on the ship may be opened after the terminal control room operator has been informed and after the operator confirms that the BOG return valve at the terminal has been opened.

In case of unlikely situation when the pressure in ship’s cargo tanks is exceeded and the vessel has no other mean to control it and simultaneously the terminal is not in position to take BOG ashore yet it is possible to obtain terminal permission for venting BOG to atmosphere (as a rule it is forbidden and can only be allowed in exceptional circumstances).

G.9 “Warm ESD” test

The objective of the test confirming the unloading is to verify whether the unloading arm ESD (Emergency Shut-Down) level 1 function executed by the terminal ESD system is executed correctly in terms of closing of the ESD system valves onshore. The UZ-ESD2A (unloading arm ESD level 1 function for excessive projection of the unloading arm) and UZ-ESD2B (activation of the unloading arm ESD level 1 function + disconnection of the PERC for the second level of excessive projection of the unloading arm) functions which are executed by the unloading arm PLC controller shall NOT be tested during the pre-discharge tests.

Prior to commencement of the unloading arm cool-down process, two warm ESD (primary and secondary link) tests shall be conducted. One shall involve the activation of the system from the side of the ship and the other shall involve activation from the
side of the terminal. During the test, ship/shore and shore/ship communications must be checked. In order to mitigate the effects of uncontrolled pressure rise in the unloading arms, during the tests a confirmation should be obtained that the ship's ESD valves close before the terminal's ESD valves and that emergency stop of the unloading pumps and closing of valves on the transfer lines takes place in an adequate sequence. In any case, the closing time of the ESD valves on the ship and at the terminal must not exceed 30 seconds.

G.10 Unloading arm and line cool-down
The scope of cool-down procedure is intended to obtain target cool-down level of three liquid unloading arms and to obtain even cool-down of the flanges to prevent leaks (the BOG return arm does not require cooling).
The estimated cool-down times are ca. 60 minutes. The objective is to obtain cool-down of three unloading arms LA-1011-A/B/C, down to the temperature of -130 °C or lower at maximum cool-down rate of between 8 and 10 °C per minute.
The unloading arm cool-down process must be effected in close cooperation between the LNG carrier's senior officer and the terminal shift manager and Loading Master. After confirmation that the valves on the ship and terminal unloading lines have been correctly aligned and after mutual confirmation of readiness for cool-down of the arms, following activities shall be performed:
- After a signal from the terminal, the ship shall start the pumps;
- The terminal loading master, acting in consultation with the arm operator and ship's Gas Engineer shall control the LNG flow with adequate valves with the progress of unloading arm cool-down process;
- When the temperature inside the unloading arms reaches at least -130 °C, the cool-down process is considered completed. Arms cooldown is carried out according to Operating Manual – Unloading System.

G.11 "Cold ESD" test
The cold ESD test is performed at least once every 3 months in cooperation with the ship. The procedure is similar to that of the warm ESD test, except for the fact that it is performed after completion of unloading arm cool-down.
Valve closing check in cold conditions is normally performed before commencement of unloading operation.

G.12 Unloading commencement and control
The design unloading rate equals 12,000 m³/h with ship manifold pressure of ca. 4.5 bar. If the pressure in ship manifold is lower, the unloading rate may be smaller than 12,000 m³/h. 4.5 bar manifold pressure shall not be exceeded.
If the unloading rate exceeds 12,000 m³/h, the terminal compressors capacity may be too low with regard to the generated amount of BOG and the excess gas may be sent to the vent. Hence, it is not recommended to exceed the design unloading rate.
After completion of the unloading arms cool-down and ship’s and terminal’s confirmation of readiness for LNG unloading, the unloading pumps shall be started. In practice, it is performed in the following steps:

- The terminal confirms that all valves on the LNG unloading line are open and that it is of correct temperature;
- The ship opens all valves on LNG cargo lines and closes the cool-down valves connecting the spray lines with LNG lines at the manifold;
- Subsequent pumps are started every 5-7 minutes with adequate notification of the terminal in advance and terminal loading master consent;
- The Chief Officer of the LNG carrier shall inform the terminal on achievement of the unloading rates agreed during the pre-discharge meeting which must be each time confirmed by the Terminal shift manager / Loading Master and recorded in the cargo operations log.

G.13 Cargo sampling
An authorized employee of the terminal shall commence sampling of the LNG in accordance with an applicable process manual, after the ship has confirmed that it achieved fixed and stable unloading rate.

G.14 Unloading completion
Upon completion of the unloading operation, the chief officer should gradually reduce the unloading rate, stopping the ship’s cargo pumps one after another. The unloading must not be stopped abruptly, as this may result in a temporary pressure rise / hammering in the unloading system piping.

As the unloading progresses, the ship shall notify the terminal on the expected time of completion and, in particular, on the unloading rate ramp down. The unloading pumps are stopped by the ship in a relevant sequence and at specific time internals. The information on stopping of each pump must be transferred to the terminal and, after stopping of the last pump, the unloading completion takes place and its official time must be agreed with the terminal. In the final phase of LNG unloading, particular attention shall be paid to adequate BOG pressure control.

G.15 Drainage and nitrogen purge of unloading arms
The liquid unloading arms shall be fully emptied prior to disconnection from the LNG carrier manifold flange.

The internal side of the unloading arms (i.e. onshore side) shall be emptied to the jetty drain drum D-1011. The residual LNG on the external side of the unloading arms (i.e. on the ship side) shall be removed using nitrogen from terminal to ship tanks. The nitrogen shall be supplied to the unloading arms by the nitrogen purge lines located on the top of respective unloading arms and equipped with relevant shut-off valves. Unloading arms shall be drained in concordance with SIGTTO guidelines set out in „LNG Transfer
Arms and Manifold Draining Purging and Disconnection Procedure” and as described in Operating Manual – Unloading System.

After completion of unloading, the LNG remaining in the unloading arms shall be drained in the following sequence:

- Drainage of the internal parts of the unloading arms to the jetty drain drum;

![Diagram](image1.png)

**Fig. G1 – Unloading arms’ drainage by the terminal**

- Drainage of the contents of external part of the unloading arms to the ship cargo system with the nitrogen supplied from the terminal;

![Diagram](image2.png)

**Fig. G2 – Unloading arms’ drainage by the Carrier**

- The Gas Engineer together with unloading arms operator shall confirm that the unloading arms are liquid free by opening the drainage valve on the purge line;

![Diagram](image3.png)
• All arms are subsequently purged with nitrogen until the LNG has fully evaporated.
• Upon disconnection of unloading arms, the content of methane shall not exceed 2% of capacity. Which has to be confirmed with a gas meter suitable to measure methane content in nitrogen.

**WARNING: THE UNLOADING ARMS SHALL NOT BE SPRAYED WITH WATER TO SPEED UP ICE MELTING**

**G.16 Final CTMS measurement and post-discharge meeting.**

Prior to the final CTMS measurement, one should make sure that all ESD and double shut-off valves on the manifold are closed. After this has been confirmed in the presence of the chief officer, authorized representative of the terminal (Loading Master) and an independent cargo surveyor, the final CTMS measurement shall take place, printout shall be made and CTMS report signed.

After completion of unloading, the so-called post-discharge meeting shall take place. The objectives of this meeting are as follows:

- obtaining final agreement in the scope of cargo transfer control;
- evaluation of the entire unloading operation;
- suggestion of practically reasonable or feasible improvements for future unloading operations;
- documentation of safety areas, incorrect communication, uncertainty or other problems and preparation of plans of further actions to address these issues;
- execution of document implementation procedures (i.e. minutes of meetings, checklists, etc.).
- vessel final approval for further calls.

The post-discharge meeting may be carried out simultaneously with the following activities:

- disconnection of unloading arms;
- switching off the water curtain;
- disconnection of the ship from the ship-to-shore communication system.

The post-discharge meeting shall typically take place in the ship’s Conference Room. It has to be attended by at least the Loading Master and Chief Officer.

**G.17 Disconnection of unloading and BOG return arms**

Unloading arm operators and the ship’s Gas Engineer shall make sure that the concentration of methane is below 2% by volume and, subsequently, they disconnect the unloading arms one by one and install the blind flanges. After this activity, the arms are retracted to the terminal and locked in the resting position.
G.18 Post-discharge documentation
After receiving the result of the final CTMS measurement system and checking of the atmospheric pressure. The calculation of the total unloaded LNG amount shall take place in accordance with the methodology described in the Terminal Code. The documents needed at this stage have been presented in the algorithm of the Marine Operational Manual constituting the Appendix to this Manual.

H. Emergency procedures – PE-PP-10-1-4

H.1 Source regulations and industry guidelines
- Act on Maritime Safety of September 18, 2011.
- Ordinance of the Minister of Economy of October 10, 2013 on types and quantities of hazardous substances the presence of which on the plant decides on qualifying the plant as an increased risk plant or a plant with the high risk of occurrence of serious industrial failures;
- Ordinance of the Minister of Transportation, Construction and Maritime Economy of June 22, 2012 on detailed organization of the Marine Search and Rescue Service.
- Regulation No. 3 of the Director of the Maritime Office in Szczecin of July 26, 2013 as amended: Port Regulations
- Regulation No. 1 of the Director of the Maritime Office in Szczecin on fire safety within sea ports and harbors of January 20, 1974 (as amended)
- European Resuscitation Council guidelines – ERC 2010
- Medical First Aid Guide For Use In Accidents Involving Dangerous Goods (MFAG) - 2004 Edition

H.2 Introduction
In accordance with the provisions of Polish and international law, each marine terminal should operate the approved and implemented emergency procedures. These procedure should account for any events that may occur during the operation of loading and mooring of an LNG carrier.
In the event of emergency at the terminal, the emergency signal shall be an acoustic signal (siren) combined with flashing red light.
The terminal shall be equipped with adequate devices detecting hazardous situations: fire and smoke detectors, gas detectors, CCTV system and environmental monitoring system. The detailed emergency procedures are provided in the Internal Rescue and Operation Plan approved by the Zachodniopomorskie Province Commander of the State Fire Service.
A detailed HAZOP, HAZID and QRA studies have been conducted to indicate and describe all the hazards related to ship/shore interface including: cargo operational issues berthing and mooring activities and natural occurrences.

H.3  Goal of this section
The chapter below is intended to present the procedures applicable at the LNG Terminal in Świnoujście which are binding for the ship and the terminal in emergency situations and enabling quick and organized response to a hazard.

H.4  Range
Adequately prepared emergency procedures are among the key factors impacting the safety of the ship and the terminal in the event of an emergency such as: fire at the terminal, LNG carrier fire at the terminal, LNG carrier collision with the berth, depressurization of the unloading system and LNG leak, occurrence of an LNG cloud, explosion of cargo cloud, leaks from the hydraulic system, movement of the unloading arms beyond their operating range, accident involving humans, necessity of evacuation from the ship and ship berth or necessity of emergency unberthing. The procedures indicated below shall be binding primarily for the LNG carrier crew and terminal personnel. The obligation to comply with the emergency procedures shall apply also to entities cooperating with the terminal operator or ship owner/operator: i.e. tugboat and mooring boat crews, linesmen, ship agents, service providers, terminal user representatives and all other entities/persons present onboard the ship or within the marine part of the terminal during port operations.

Potential hazards at the ship / terminal interface
Potential hazards to personnel health and safety related to the unloading system are summarized in the table below which also specifies potential consequences as well as measures to be undertaken to reduce the probability of hazard occurrence.

<table>
<thead>
<tr>
<th>Source</th>
<th>Place of occurrence</th>
<th>Potential consequences</th>
<th>Hazard occurrence risk mitigation</th>
</tr>
</thead>
<tbody>
<tr>
<td>LNG leaks</td>
<td>Unloading arms, LNG pipelines, jetty drain drum</td>
<td>Fire, frost bites</td>
<td>Protective clothes, personal protection equipment, trainings, gas detectors, operating manuals and work station procedures.</td>
</tr>
<tr>
<td>Source</td>
<td>Place of occurrence</td>
<td>Potential consequences</td>
<td>Hazard occurrence risk mitigation</td>
</tr>
<tr>
<td>------------------------</td>
<td>-----------------------------------------------------------------</td>
<td>-------------------------------------------------------------</td>
<td>---------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Natural gas leaks</td>
<td>BOG return header, jetty drain drum and BOG arm</td>
<td>Fire, explosion</td>
<td>Protective clothes, personal protection equipment, trainings, gas detectors, operating manuals and work station procedures.</td>
</tr>
<tr>
<td>Electric Current</td>
<td>Electrical networks, electrical panels of unloading arms and auxiliary systems</td>
<td>Electric shock, serious body injuries, burns, death</td>
<td>Restricted access to electrical equipment, description of electrical devices, warning marks, work station procedures, working and protective clothing, personal protective equipment, equipment for penetration protection.</td>
</tr>
<tr>
<td>Rotating equipment</td>
<td>Unloading arms hydraulic pumps</td>
<td>Serious body injuries, death</td>
<td>Personal protection equipment, trainings, operating manuals and work station procedures.</td>
</tr>
<tr>
<td>Equipment maneuvering</td>
<td>Unloading arms platform, gangway</td>
<td>Contusions, fractures, serious body injuries, death</td>
<td>Personal protection equipment, trainings, operating manuals and work station procedures.</td>
</tr>
<tr>
<td>Works at heights</td>
<td>Pipe racks, unloading arms platforms, access platform, supports, ladders</td>
<td>Falls, fractures, contusions, internal injuries and death</td>
<td>Personal protection equipment against falls, trainings, work station procedures, safety harness.</td>
</tr>
</tbody>
</table>

Table H1. Potential hazards at the ship / terminal interface

**Rules of procedure in the event of an accident involving humans**

In the event of occurrence of one or more events described in the column "Potential consequences" of the above table H1, the activities of the terminal operator's personnel shall always be supervised by the shift manager, adequately to the situation and held training in the scope of first aid to persons injured as a result of contact with LNG, fire, explosion, electric shock or fall from height. The rules of first aid shall comply with the guidelines of ERC and MFAG.

The basic duties of the shift manager or persons indicated thereby shall include:
- Securing the accident site against escalation of accident consequences if justified by existing circumstances.
- Provision of first aid to the injured persons or persons in danger.
- Notification of relevant services in accordance with the emergency contacts list.

Further division of activities shall depend on the character of events accompanying the accident (fire, explosion, leak) and it described in further part of this chapter.

**Rules of providing first aid (in compliance with the guidelines of ERC and MFAG):**

- Make sure the aid can be given in a safe manner (so that the rescuer does not become the next injured person).
- If needs, remove the injured persons / persons from the accident site.
- Use breathing apparatuses if a risk of toxic atmosphere is present.
- Evaluate the condition of the injured person, in accordance with MFAG:

  ![Evaluation of breathing](image)

  **Evaluation of breathing**

  ![Recovery position](image)

  **Recovery position**

  ![Evaluation of pulse](image)

  **Evaluation of pulse**
If pulse can be felt in the injured person but no breathing can be noticed, artificial respiration shall be applied following the rules below:

- Clear the respiratory ducts

- Perform artificial respiration at a rate of 10-12 breaths per minute (1 every ca. 5 seconds) starting with four breaths without the 5 second interval.

If the circulation has stopped, the procedure below should be followed:

- Chest compressions combined with artificial respiration should be performed immediately considering the fact that after 4 to 6 minutes from cardiac arrest, irreversible changes in the brain and death may occur.
- To ensure that chest compressions are effective, the injured person must be laid on a hard and even surface.
- The chest compressions should be performed by compressing the injured person’s chest to the depth of 4-5 cm at the rate of 60 compressions per minute. The place of chest compressions is shown on the drawing below.
- In case of two rescuers (preferred option), one breath shall be performed per five chest compressions (at the rate of 60 compressions per minute), without interrupting the chest compressions.

- For one rescuer, the recommended pattern is 2 breaths per 30 chest compressions – the rate of compression should be increased to ca. 80 per minute.

**Health and safety instructions contributing to prevention of accidents**
• The personnel shall be trained in the scope of knowledge on health and safety regulations and in equipment operation.
• Cleanliness and order shall be maintained on the platforms around the unloading arms and in the area of the jetty drain drum.
• It is forbidden to smoke or use open fire in all areas in which the unloading operations are performed.
• Persons in inadequate physical or mental conditions shall not be allowed to operate the equipment. It is strictly forbidden to consume alcohol or remain present in the unloading zone after alcohol consumption.
• All personnel working at the unloading system shall wear adequate personal protection equipment (protective hat, hearing protections and safety glasses).
• All works that may cause exposure to liquid methane should be performed by persons using adequate protections (gloves and glasses).
• The machinery, tools and their protective elements shall be maintained in technically operable condition and cleanliness to ensure that operation of such equipment shall not cause a hazard to health and safety of personnel.
• The equipment which has been found during operation to be defective, shall be stopped immediately and disconnected from the power source. It is forbidden to restart such equipment without repairs.
• It is forbidden to perform repairs of tanks, common units such as pump skids and other tank equipment during their operation.
• Unauthorized persons are strictly forbidden to approach any equipment.
• Faulty or damaged equipment or equipment during repairs shall be clearly marked with information boards and secured so as to prevent their use.
• The equipment in operation must not be repaired, cleaned or lubricated except for lubrication with purpose-built instruments specified in the operation and maintenance manual.
• Mobile lighting devices and power tools used during the maintenance and repair works shall meet the requirements in the scope of protection against electric shock.
• The personnel operating the equipment involving rotating parts shall wear clothes without loose (hanging) parts during works and in hard hats shielding their hair.
• In the event of an accident, the injured person shall be provided first aid, the ambulance should be called and technical inspection authority as well as health and safety specialists.
• The personnel operating the system should be familiarized with the operation and maintenance documentation (supplied by the manufacturer) of respective equipment included in the system.
• System equipment, in particular the measuring instruments, safety valves, insulation and handrails shall be maintained in proper technical condition ensuring safe operation.
• Particular attention should be paid during operation of pressurized vessels, as in case of jetty drain drum D-1011.
• Any emergencies shall be immediately reported to superiors.

**It is strictly forbidden to:**
• operate the system equipment without adequately designed protective devices;
• operate the equipment with damaged instrumentation or signaling devices;
• change settings of protective and signaling devices by unauthorized persons;
• change settings of safety valves without authorization;
• perform repair works during system operation or when the system is pressurized;
• use damaged or unoperational work tools or protective devices.

**H.5 Emergency situations within the berth**

Actions that must be taken by the terminal in case of an emergency situation are described in detail in the Internal Operation and Rescue Plan. In case of an emergency situation occurrence, it should be considered each time whether to unberth and tow the ship away from the berth. Terminal loading master is every time appointed as on-scene commander for any emergency situations within the berth. He is also responsible for emergency communication with all "marine" services.

**Fire at the Terminal**

In case of detection of a fire, a terminal operator worker is obliged to immediately activate the nearest alarm button and to inform the shift manager or panel operator in the main control room. The panel operator from the main control room immediately informs the duty officer of the ship by the hot line communication system or by radio. Immediately after detecting a fire the panel operator activates the ESD 1 system causing a halt of the unloading. If the fire takes place within the unloading platform, the ESD 1 system can also be activated locally by the unloading arms operator, from jetty control room or main control room. After confirming the stop of the LNG tanker pumps and after closing the ESD valves the Loading Master, after analyzing the situation, instructs the unloading arms operator to do an emergency drainage and disconnection in coordination with the ship or, if it is impossible, he orders an evacuation of the personnel from the danger zone and then commands the activation of the ESD 2. The initiation of the fire-extinguishing system is done remotely from the main control room or from the jetty control room. Controlling of the fire monitors is also done remotely. In case of a decision about an emergency unberthing
is made by Loading Master the PE-PP-10-1-7 procedure described in section H.9 is to be followed. The shift manager or an appointed person informs the State Fire Service and loading master informs the Duty Officer of the Port Authority and the VTS (VHF 12 or 16), the Port Fire and Rescue Service, including the fireboat and the tugboats on appropriate UHF channels agreed.

**Actions of the terminal worker after noticing a fire:**

- Pressing the nearest fire alarm activation button.
- Informing the shift manager in the main control room by radio or emergency telephone.
- If possible – taking action aimed at minimizing the effects of the fire and following shift manager’s or loading master’s instructions.

**Actions of the shift manager / duty panel operator and loading master:**

- Informing the duty officer of the ship by the hot line or by radio.
- Activation of the ESD 1 system.
- Confirming the halt of the loading pumps and the ESD valves with the ship and instructing the ship to stop all operations.
- Instructing the ship to prepare to disconnect the unloading arms.
- Instructing the unloading arms operators to drain and disconnect them.
- Order to evacuate the personnel from the danger zone.
- Remote activation of the fire protection system.
- Informing the services and institutions in accordance with the list of contacts in section I of the present instruction.
- Informing the Duty Officer of the Port Authority and the VTS and requesting a fire unit and the tugboats.
- Activation of an emergency unberthing procedure (after such decision has been made by the Loading Master).
- Directing the rescue and fire-fighting action until the arrival of the State Fire Service.

*If the fire covers the unloading platform and the situation prevents the disconnection of the arms through their emergency draining from both sides and opening the QC/DC, the Loading Master makes a decision on activating the ESD 2, which results in activation of the PERC connectors.*

**Unsealing and an LNG leak from the terminal system**

A terminal worker who notices an LNG leak from the terminal system must immediately inform the shift manager and the main control room. The panel operator activates the alarm and informs the duty officer of the ship by the hot line system or by radio. At the same time, the ESD 1 system is activated (locally, from the jetty control room or from
the main control room). After receiving a confirmation of a stop of the ship's loading pumps and closure of the ESD valves, the Loading Master instructs the draining and disconnection of the unloading arms and, depending on the character of the leak, makes a decision on activating the PE-PP-10-1-7 emergency unberthing procedure described in section H.9. The Loading Master orders the evacuation of the personnel from the danger zone and informs the shift manager of the character of the threat. The shift manager informs proper services (including state fire service by red phone) and institutions in accordance with the list in section l.

**Actions of a terminal worker after detection of an unsealing and an LNG leak from the terminal system:**

- Informing the shift manager in the main control room.
- If possible – taking action aimed at minimizing the effects of the leak.
- Following shift manager’s or loading master’s instructions.

**Actions of the shift manager / duty panel operator and loading master:**

- Informing the duty officer of the ship by the hot line or by radio.
- Activation of the ESD 1 system.
- Confirming the halt of the loading pumps and the ESD valves with the ship and instructing the ship to stop all operations.
- Instructing the ship to prepare to disconnect the unloading arms.
- Instructing the unloading arms operators to drain and disconnect them.
- Order to evacuate the personnel from the danger zone.
- Informing the proper services and institutions in accordance with the emergency contacts list from section l.
- Informing the Duty Officer of the Port Authority and the VTS and requesting a fire unit and the tugboats.
- Directing the rescue action until the arrival of the State Fire Service.

**Collision of the LNG tanker with the berth**

In case of a collision of the LNG tanker with the berth, the ship's crew has an obligation to take actions aimed at ensuring the safety of the ship and the terminal in accordance with the ship emergency plan (Shipboard Contingency Plan). The terminal will provide the ship with necessary support in the above-mentioned actions. Depending on the type of event that is the result of the collision (fire, explosion, unsealing of the loading system) actions described in adequate points of the present chapter will be taken. The Duty Officer of the Port Authority and the VTS must be immediately informed about the event that occurred.
H.6 Emergency situations on the LNG tanker

Fire on the LNG tanker

In case of an emergency situation on the LNG tanker (fire, explosion), the first action taken by the ship is to notify terminal control room by hot line or radio system and raise an alarm consisting of a series of long signals made by the ship's siren – each of them lasting for at least 10 seconds. The signals must be made until a confirmation from the terminal. The alarm signals are established and confirmed during the pre-discharge meeting.

In an emergency situation, all port operations (mooring, unloading, ballasting, taking supplies, submitting the refuse, etc.) must be immediately stopped and the main engines and the steering engine must be put in a standby

After raising an alarm, the captain of the tanker takes responsibility over directing and supervision of the operation on the LNG tanker. On the premises, the operation is directed by an officer appointed by the captain and supported by the ship’s crew. The procedure in case of an occurrence of a threat should be consistent with the ship’s emergency situation procedure plan (Shipboard Contingency Plans).

A specialized terminal personnel with the fire service and port rescue and fire service will cooperate with the LNG tanker crew in order to control the emergency situation as fast as possible. After hearing the alarm signal from the ship, a terminal worker located on the berth should inform the shift manager or panel operator in the main control room as soon as possible (regardless of the fact that they have been notified by the ship’s duty officer). An alarm from the main control room should be activated.

The next step is an immediate stop of the loading operation through the activation of the ESD system (unless the ship has already done it), informing the state fire service. Notification of assisting units in that ship, including the fire ship and fire service units, the Duty Officer of the Port Authority and the VTS, SAR, and the medical service is carried out by the loading master by use of the appropriate radio channels.

Actions of the ship’s crew after detection of a fire on board:

- Informing Loading Master
- Informing the terminal control room by hot line.
- Raising an alarm consisting of a series of long signals made by the ship’s siren – each of them lasting for at least 10 seconds. The signals must be made until a confirmation from the terminal. The alarm signals are established and confirmed during the pre-discharge meeting.
- Activation of ESD 1.
• Activation of the ship’s recovery plan and undertaking an extinguishing action in accordance with this plan.
• Full cooperation with terminal personnel.

Actions of a terminal worker in case of noticing a fire on the LNG tanker:

• Pressing the nearest fire alarm activation button.
• Informing Loading Master
• Informing the shift manager in the main control room.
• Following the shift manager’s and loading master’s instructions.
• Evacuation of the LNG carrier area.

Actions of the shift manager / duty panel operator and loading master:

• Activation of the ESD 1 system (unless the ship has already done it)
• Confirming the halt of the loading pumps and the ESD valves with the ship and instructing the ship to stop all operations.
• Instructing the ship to prepare to disconnect the unloading arms.
• Instructing the unloading arms operators to drain and disconnect them.
• Order to evacuate the personnel from the danger zone.
• Activation of the fire extinguishing system (fire monitors) and fire assistance upon request of the ship.
• Informing the services (state fire service by red phone) and institutions in accordance with the list of contacts in section I of the present instruction.
• Informing the Duty Officer of the Port Authority and the VTS and requesting a fire unit and the tugboats.
• Activation of an emergency unberthing procedure (after such decision has been made by the Loading Master).
• Directing the rescue and fire-fighting action from land until the arrival of the State Fire Service.

*If the fire covers the manifold of the LNG tanker and the situation prevents the disconnection of the arms through their emergency draining from both sides and the opening of QC/DC, the Loading Master makes a decision on activating the ESD 2 system which results in activation of the PERC connectors.

The Loading Master, in consultation with the captain of the ship, makes a decision on the necessity of an emergency unberthing.

Unsealing and an LNG leak from the loading system of the ship

In case of an occurrence of an LNG leak from the loading system of the ship, the first action taken by the duty officer of the ship is to notify terminal control room by hot line
or radio system and raising an alarm consisting of a series of long signals made by the ship’s siren – each of them lasting for at least 10 seconds. The signals must be made until a confirmation from the terminal. The alarm signals are established and confirmed during the pre-discharge meeting.

In an emergency situation, all port operations (mooring, unloading, ballasting, taking supplies, submitting the refuse, etc.) must be immediately stopped and the main engines and the steering engine must be put in standby.

After raising an alarm, the captain of the tanker takes responsibility over directing and supervision of the operation on the LNG tanker. On the premises, the operation is directed by an officer appointed by the captain and supported by the ship’s crew. The procedure in case of an occurrence of a threat should be consistent with the ship’s emergency situation procedure plan (Shipboard Contingency Plans).

The terminal worker who notices the LNG leak from the loading system of the ship must immediately inform the shift manager in the main control room. The panel operator activates the alarm. At the same time, the ESD 1 system is activated (unless the ship has already done it). After receiving a confirmation of a stop of the ship’s loading pumps and closure of the ESD valves, the Loading Master instructs the draining and disconnection of the unloading arms and, depending on the character of the leak, makes a decision on activating the PE-PP-10-1-7 emergency unberthing procedure described in section H.9. The Loading Master orders an evacuation of the personnel from the danger zone and informs the shift manager of the character of the threat.

The shift manager informs proper services and institutions in accordance with the list in section I. The loading master informs all relevant marine services (VTS, port fire and rescue service, tugs).

Actions of the ship’s crew after detection of a leak on the shipboard:

- Informing Loading Master
- Informing of the shift manager in the main control room in the terminal.
- Raising an alarm consisting of a series of long signals made by the ship’s siren – each of them lasting for at least 10 seconds. The signals must be made until a confirmation from the terminal. The alarm signals are established and confirmed during the pre-discharge meeting.
- Activation of ESD 1.
- Activation of the recovery plan and undertaking an action in accordance with this plan.

Actions of a terminal worker after detection of an unsealing and an LNG leak from the loading system of the ship:

- Informing Loading Master
• Informing the shift manager in the main control room.

**Actions of the shift manager / duty panel operator and loading master:**

• Informing the duty officer of the ship by the hot line or by radio.
• Activation of the ESD 1 system.
• Confirming the halt of the loading pumps and the ESD valves with the ship and instructing the ship to stop all operations.
• Instructing the ship to prepare to disconnect the unloading arms.
• Instructing the unloading arms operators to drain and disconnect them.
• Order to evacuate the personnel from the danger zone.
• Informing the proper services and institutions in accordance with the emergency contacts list from section I.
• Informing the Duty Officer of the Port Authority and the VTS and requesting a fire unit and the tugboats.
• Directing the rescue action from land until the arrival of the State Fire Service.
• Informing the services (Fire service, Duty Officer of the Świnoujście Port Authority and VTS).

The Loading Master, in consultation with the captain of the ship, has to make a decision on the necessity of an emergency unberthing.

**Collision of the LNG tanker with the berth**

In case of a collision of the LNG tanker with the berth, the ship’s crew has an obligation to take actions aimed at ensuring the safety of the ship and the terminal in accordance with the ship emergency plan (Shipboard Contingency Plan). The terminal will provide the ship with necessary support in the above-mentioned actions. Depending on the type of event that is the result of the collision (fire, explosion, unsealing of the loading system) actions described in adequate points of the present chapter will be taken. The Duty Officer of the Port Authority and the VTS must be immediately informed about the event that occurred.

**Collision or grounding of LNG tanker on the approach to the terminal**

In case of collision or grounding of LNG tanker on the approach fairway the vessel should follow Port Regulations and immediately inform the Duty Officer of the port and VTS on VHF Ch 12. The terminal will assist and cooperate with the ship by all means available this include informing “shore based” emergency services if necessary.
H.7 Detection of an emergency situation by the ship at the berth
In case of an occurrence of an emergency situation at the berth, the ship has an obligation to inform the main control room in the terminal about it via the fastest possible method (Hot Line, VHF/UHF, phone, ship’s siren). Loading operations, ballasting, collection of supplies or submitting the refuse should be stopped.

Actions of the ship’s crew after detection of a fire:
- Activation of ESD 1.
- Evacuation of the LNG carrier area.
- Informing the services (Fire service, Duty Officer of the Port Authority and VTS, Port Fire and Rescue Service, tugs)
- Activating the emergency plan

The Loading Master, in consultation with the captain of the ship, makes a decision on the necessity of an emergency unberthing.

Actions of the terminal crew after detection of a leak:
- Activation of ESD 1.
- Informing the services (Fire service, Duty Officer of the Port Authority and VTS, SAR)
- Activating the recovery plan

The Loading Master, in consultation with the captain of the ship, makes a decision on the necessity of an emergency unberthing.

H.8 Evacuation of the ship and evacuation of the LNG unloading platform

Evacuation of the ship and evacuation of the LNG carrier area is always ordered in case of fire of the terminal LNG tanks, loading system or the LNG tanker. It is determined by the possibility of LNG fumes explosion with a very large radius. A safe distance is considered 1,000 m from the fire. An evacuation is ordered also in case of an occurrence of a serious malfunction of the process system that puts the life and health of people in direct danger. A decision about the evacuation during the unloading of the LNG tanker is made by the Loading Master.

A plan of evacuation of the LNG carrier area with marked evacuation routes constitutes appendix No. 12 to the present instruction.
H.9 The procedure of emergency unberthing and departure from the berth into the center of the turning basin – PE-PP-10-1-7

The Loading Master, in consultation with the Captain of the ship, makes a decision on the necessity of the ship’s departure from the terminal in case when its stay in the berth constitutes a threat to the personnel, the natural environment, the mooring system and/or the LNG carrier area. It is important that especially in case of rough weather conditions (strong wind, squalls), both ship’s captain and terminal loading master may consider safer to leave the vessel at berth, assisted by tugs with arms disconnected then decide to unberth the vessel. St-by tugs will assist the ship and prevent any uncontrolled movements.

It is advised to consider an emergency unberthing and departure from the berth in the following cases:

1. Fire at the Terminal.
2. Fire on the LNG tanker.
3. Break away of the ship from the berth.
4. Excess of the operational range of the unloading arms (activation of the first degree alarm)
5. Activation of ESD 2.
6. An occurrence of boundary conditions of wind velocity for the emergency unberthing given in the present instruction.
7. LNG leak from the ship system.
8. LNG leak from the terminal system.

If the situation and the time allow it and there is an uninhibited access to the mooring stations of the LNG tanker, the unberthing should occur after previous loosing of all the mooring ropes. The Loading Master, after making sure that the tugboats made fast the emergency toelines or they are connected to sunken bitts, gives an order of releasing the quick release hooks and informs the captain of the ship about the possibility of heaving up the mooring ropes on board.

In case when an emergency situation develops dynamically and/or there is no access to the mooring stations, the quick release hooks can be activated under load conditions from jetty control room. In that case it is advised to maintain exceptional caution and under no circumstances get close to the maneuvering boards of the tanker and the mooring dolphins. A rapid release of energy accumulated in the loaded mooring lines and caused by the activation of the hook releasing system constitutes a serious threat to the people located in the nearest surroundings.
Readiness of the ship, availability of the pilots and towing assistance upon emergency unberthing

Readiness of the ship
In accordance with the Marine Operations Manual, it is not allowed to perform any works on an LNG tanker moored to the terminal that have a negative influence on the time of readiness of the main engines, the steering engine and the mooring navigation equipment. In practice, the time needed for attaining such readiness amounts from 30 minutes which basically eliminates the possibility of using the native drive in emergency unberthing.

Availability of the pilot
In accordance with the Port Regulations, and consequently the Marine Operations Manual, the pilot stays on board of the LNG tanker throughout the whole time of the unloading. The availability of the pilot in case of a necessity of an emergency unberthing is therefore ensured.

Readiness of the tugboats
In accordance with the Port Regulations, the tugboats must remain in assistance during the stop of the LNG tanker in the terminal. They moor at the low berth, about 500 m from the reloading platform. The tugboats are to remain in full readiness (the so-called Hot Stand-by). After receiving a signal of the necessity of emergency unberthing, the tugboats immediately go in the direction of the LNG tanker, connect the emergency towlines (fire wires or sunken bitts), and pull the ship away from the berth. The remaining tugboats stay in passive assistance and, whenever needed, they control the moves of the ship in accordance with the directions of the LNG tanker’s captain and the pilot, leading the ship out into the center of the turning basin. The tugboats keep the Hot Stand-by through conducting constant listening at a VHF channel established during the pre-discharge meeting.

The fire unit is obliged to obey the same communication regulations as the tugboats.

Coordination of an emergency unberthing from the terminal
A decision on an emergency unberthing is made by the Loading Master in consultation with the captain of the ship. Whenever it is necessary, the Loading Master gives an order to activate the quick release hooks system – or from the PNDS control room (jetty control room).

Communication upon emergency unberthing
In case of a necessity of an emergency unberthing, a notification is passed to the terminal (hot line, telephone, radiotelephone), the pilot, the Duty Officer of the Port Authority and VTS (in accordance with the contacts list of the Marine Operation and Safe LNG Carrier Berthing Procedures), tugboats (VHF), the fire unit (VHF) and the remaining services when needed.

I. List of contacts

Świnoujście Port Captain's Office
ul. Wybrzeże Władysława IV 7
72-600 Świnoujście
Tel. +48 91 321 36 62

Duty Officer of the Port Authority and VTS – Świnoujście
Contact person: Duty Officer of the Port Authority (VTS)
Calling: Świnoujście Traffic
VHF: Channel 16, 12, 70
Telephone: +48 91 321 62 03, +48 91 440 35 89
Faks: +48 91 321 67 70
email: swinoujscietraffic@ums.gov.pl

Pilot Station – Szczecin (Świnoujście Pilot Station Dispatch Office)
Contact person: Dispatcher
Calling: Świnoujście Pilot
VHF: Channel 68
Telephone: (24 h): +48 91 321 34 31
Faks: +48 91 321 34 31
e-mail: stacja-swin@szczecinpilot.pl

Base of Navigation Marking in Świnoujście
ul. Fińska 5
72-602 Świnoujście
Telephone: +48 91 321 62 50

Towing company designated to service of LNG tankers

Towing company residing in the Świnoujście Port
ul. Wybrzeże Władysława IV 3
72-600 Świnoujście
Telephone: + 48 606 332 129
Municipal Headquarters of the State Fire Service in Świnoujście
Contact person: Duty Officer of the Municipal Control Station
Address: 72-600 Świnoujście, ul. Piastowska 2a
Tel.: +48 91 321 44 08 – head office; +48 91 327 52 10 – secretariat; +48 91 321 44 08 – Municipal Control Station;
Tel. alarm number: 998 – alarm number MCS;
Fax. +48 91 321 42 89 – secretariat; +48 91 321 42 89 after 3:30 p.m. mon-fri. – MCS
E-mail: km.swinoujscie@szczecin.kwpsp.gov.pl - MSK

Regional Headquarters of the State Fire Service in Szczecin
Address: ul. Firlika 9-14, 71-637 Szczecin
Telephone: +48 91 480 88 01
Fax: +48 91 480 88 02
E-mail: kancelaria@szczecin.kwpsp.gov.pl

Municipal Police Headquarters in Świnoujście
Contact person: Duty Officer
Address: 72-600 Świnoujście, ul. Krzywoustego 2a
Telephone: + 48 91 326 75 11
Tel. alarm number: 997, 112
Fax. + 48 91 326 75 13
E-mail: policja@policja.swinoujscie.pl

Maritime Border Guard Branch
Pomeranian Border Guard Division
ul. Grodzka 4, 72-600 Świnoujście
Telephone: +48 91 322 52 15
Fax: +48 91 322 52 09

Border Guard Outpost in Świnoujście
Address: ul. Dworcowa 1, 72-606 Świnoujście
Telephone: +48 91 322 72 00;
Fax: +48 91 322 72 05

Voivodeship Office – Regional Crisis Management Center
Contact person: Center Attendant
Address: 70-502 Szczecin, Wały Chrobrego 4
Telephone: +48 91 430 33 42,
Fax: +48 91 433 85 22
E-mail: wczk@szczecin.uw.gov.pl
Group Duty Worksite
Telephone: +48 91 430 33 42
Mobile tel. no.: +48 696 031 168
Fax. +48 91 433 85 22
Helpline: +48 800 170 010
E-mail: wczk@szczecin.uw.gov.pl

Crisis Management Department (CMD) – Świnoujście
City Hall of Świnoujście
Address: 72-600 Świnoujście, ul. Wojska Polskiego 1/1
Telephone: +48 91 321 44 26, +48 91 322 00 08, +48 91 322 00 09
Faks: 91 321 44 26
email: wzk@um.swinoujscie.pl

Maritime Search and Rescue Service SAR
Auxiliary Coordination Center
Address: Świnoujście, ul. Władysława IV 7
Telephone: +48 91 321 49 17
Faks: +48 91 321 59 29
Mobile: +48 505 050 969

Maritime Search and Rescue Service SAR
Contact person: Duty officer of the Maritime Rescue Coordination Center
Address: Gdynia, ul. Hryniewieckiego 10
Telephone: +48 58 620 55 51
Telephone: +48 58 620 55 51
Mobile: +48 505 050 971

Port Rescue Service
Contact person: Duty Officer
Address: Szczecin, ul. Bytomska 1
Tel. (24 h): +48 91 430 82 55
Alarm Point:
Telephone: +48 91 430 89 98, +48 91 430 83 55,
Faks: +48 91 462 41 12,
e-mail: psr@port.szczecin.pl
Commandant
Telephone: +48 91 430 82 55,
Mobile: +48 601 722 849,
e-mail: a.byczek@port.szczecin.pl
Fireboat STRAŻAK 26 – Świnoujście
Regional Emergency Ambulance Service Station in Szczecin
Duty Service Tel. 999, 112
Address: 70-526 Szczecin, ul. Mazowiecka 14
Tel. 24 h 999, 112

Emergency Ambulance Service of the Independent Public Health Care Center in the
Alfred Sokołowski Municipal Hospital in Świnoujście
Address: ul. Mieszka I 7, Świnoujście
Telephone: +48 91 321 41 74

Szczecin and Świnoujście Seaport Authority
Contact person: Main Port Dispatcher
Szczecin, ul. Bytomska 7
Tel: (24 h) 91 430 83 71,
Mobile tel. no.: 46 34
e-mail: dispatcher@port.szczecin.pl
## J. Appendices.

### J.1 Appendix No. 1 – List of documents – PE-PP-10-1-W1

<table>
<thead>
<tr>
<th>CHPP</th>
<th>Description</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>PN-EN 1473</td>
<td>Installations and Equipment for Liquefied Natural Gas.</td>
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<td>PN-EN 13852-1:2013.</td>
<td>Off-shore lifting equipment requirements</td>
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<table>
<thead>
<tr>
<th>INTERNATIONAL MARITIME ORGANIZATION</th>
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<td>Revised Recommendations on the Safe Transport of Dangerous Cargoes and Related Activities</td>
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<td>IMO D11QE</td>
<td>International Convention for the Safety of Life at Sea (SOLAS)</td>
</tr>
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<td>IMO 173E</td>
<td>SOLAS Amendments 2006</td>
</tr>
<tr>
<td>IMO 479E</td>
<td>Convention Compensation on Liability for Damage in Connection from Car.Haz. / Noxious (HNS Convention)</td>
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<tr>
<td>IMO 117E</td>
<td>International Safety Management Code (ISM &amp; Guidelines for Implement of the ISM)</td>
</tr>
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<td>IMO</td>
<td>Code for Existing Ships Carrying Liquefied Gases in Bulk (Existing Ship Code)</td>
</tr>
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<td>IMO</td>
<td>Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk (GC Code)</td>
</tr>
<tr>
<td>IMO</td>
<td>International Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk (IGC Code)</td>
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<td>Mooring Equipment Guidelines</td>
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<td>Ship Information Questionnaire for Gas Carriers</td>
</tr>
<tr>
<td>SIGTTO</td>
<td>The Training of Terminal Staff involved in the Loading and Discharging of Gas Carriers</td>
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<td>WG061</td>
<td>Guide to Contingency Planning for Marine Terminals Handling Liquefied Gases in Bulk</td>
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<td>Tug Use in Port (A Practical Guide)</td>
</tr>
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<td>Tanker Safety Guide (Liquefied Gas) - International Chamber of Shipping</td>
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<td>Ship/Shore interface Communications Necessary for Matching Ship to Berth - SIGTTO</td>
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<td>Recommendations for Manifolds for Refrigerated Liquefied Natural Gas Carriers (LNG) - SIGTTO</td>
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<td>LNG Custody Transfer Handbook</td>
</tr>
<tr>
<td><strong>INDUSTRY RECOMMENDATIONS</strong></td>
<td></td>
</tr>
<tr>
<td>SIGTTO</td>
<td>Rollover Prevention - A Review of Causes, Methods for Prevention and Damage Limitation Measures</td>
</tr>
<tr>
<td>SIGTTO</td>
<td>Site Selection and Design for LNG Ports and Jetties</td>
</tr>
<tr>
<td>SIGTTO</td>
<td>Accident Prevention - The Use of Hoses &amp; Hard Arms at Marine Terminals Handling Liquefied Gases</td>
</tr>
</tbody>
</table>
The Ship/Shore Safety Check List
(Lista Kontrolna Bezpieczeństwa Statek/Terminal)

PE-PP-10-1-F-1
Emergency Actions
(Działania w sytuacji zagrożenia)

The actions to be taken in the event of an emergency at a terminal should be contained in the terminal’s emergency plan. Particular attention should be given to factors to be taken into consideration when deciding whether or not to remove a ship from the berth in the event of an emergency. (Działania jakie musza zostać podjęte w przypadku sytuacji awaryjnej na terminalu powinny być zawarte w planie awaryjnym terminala. W przypadku poważnego zagrożenia bezpieczeństwa należy rozważyć awaryjne odholowanie statku od nabrzeża).

Fire or Explosion on a Berth
(Pożar lub wybuch na nabrzeżu)

**Action by Ships:** Should a fire or explosion occur on a berth, the ship or ships at the berth must immediately report the incident to the terminal control room by the quickest possible method (VHF/UHF, telephone contact, sounding ship’s siren etc). All cargo, bunkering, deballasting and tank cleaning operations should be shut down and all cargo arms or hoses should be drained ready for disconnection. The ship’s fire mains should be pressurised and water fog applied in strategic places. The ship’s engines, steering gear and unmooring equipment must be brought to a state of immediate readiness. A pilot ladder should be deployed on the offshore side. (W przypadku pożaru lub wybuchu na nabrzeżu statek ma obowiązek natychmiastowego powiadomienia sterowni głównej terminalu najszybszą możliwą metodą (VHF/UHF, telefon, syrena statkowa). Operacje ładunkowe i balastowe muszą zostać natychmiast przerwane, a ramiona rozładowcze zdrenowane i przygotowane do awaryjnego rozłączenia. Statkowa instalacja ppoż. powinna być utrzymywana pod ciśnieniem, a odpowiedni system ppoż. (w przypadku LNG – proszkowy) powinien być gotowy do natychmiastowego użycia. Silnik główny, maszynka sterowa i system cumowniczy powinny być w stanie natychmiastowej gotowości. Od strony wody powinien zostać przygotowany sztormtrap pilotowy).

Fire on a Tanker at a Terminal
(Pożar na zbiornikowcu przy terminalu)

If a fire breaks out on a tanker while at a terminal, the tanker must raise the alarm by sounding the recognized alarm signal consisting of a series of long blasts on the ship’s whistle, each blast being not less than 10 seconds in duration unless the terminal has notified the ship of some other locally recognised alarm signal. All cargo, bunkering or ballasting operations must be stopped. (W przypadku pożaru na zbiornikowcu zatoga
ma obowiązek podnieść alarm za pomocą uzgodnionego wcześniej sygnału składającego się z serii długich, trwających co najmniej 10 sekund, dźwięków nadanych syreną okrętową – jeśli nie ustalono innego sygnału. Operacje ładunkowe i balastowe muszą zostać wstrzymane, a statkowy plan awaryjny (contingency plan) wcielony w życie).

<table>
<thead>
<tr>
<th>Ship’s Name:</th>
<th>(Nazwa statku)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Terminal Name &amp; Berth No.:</td>
<td>(Nazwa i numer nabrzeża)</td>
</tr>
<tr>
<td>Date of Arrival:</td>
<td>(Data zawinięcia)</td>
</tr>
<tr>
<td>Port:</td>
<td></td>
</tr>
<tr>
<td>Time of Arrival:</td>
<td>(Czas zawinięcia)</td>
</tr>
</tbody>
</table>

**Instructions for completion**

(Instrukcja wypełniania)

The safety of operations requires that all questions should be answered affirmatively by clearly ticking (v) the appropriate box. If an affirmative answer is not possible, the reason should be given and agreement reached upon appropriate precautions to be taken between the ship and terminal. Where any question is consider to be not applicable, then a note to that effect should be inserted in the remarks column.

(Bezpieczeństwo operacji wymaga udzielenia odpowiedzi na wszystkie pytania i postawienie znaku (v) w odpowiednim polu. Jeśli udzielenie pozytywnej odpowiedzi jest niemożliwe, powinien być podany tego powód oraz musi nastąpić odpowiednie uzgodnienie między statkiem i terminalem).

A box in the columns „Ship” and „Terminal” indicates that checks should be carried out by the party concerned.

(Pola w kolumnach “Statek” i “Terminal” wskazują która strona przeprowadza kontrolę spełnienia wymogów danego punktu).

The presence of the letters A, P or R in the column code indicates the following:

(Litery A, P i R postawione w kolumnie „Litery kodu” oznaczają odpowiednio):

**A** – Any procedures and agreement which should be in writing in the remarks column of this check list or other mutually acceptable form. In other case, the signature of both parties should be required.

(Litera ta oznacza, że dane ustalenie wymaga formy pisemnej w kolumnie "Uwagi" lub innej wzajemnie akceptowalnej formy ustalenia. W przeciwnym wypadku wymagany jest podpis obydwu stron).
**P** – In the case of negative answer the operation should not be carried out without the permission of the Port Authority.
(Litera ta oznacza, że w przypadku negatywnej odpowiedzi operacja nie może być prowadzona bez zgody Kapitanatu Portu).

**R** – Indicated items to be rechecked at intervals not exceeding that, agreed in the declaration.
(Litera ta wskazuje konieczność dokonywania sprawdzeń w zadeklarowanych odstępach czasu).

### Ship/Shore Safety Check List
(Lista Kontroli Bezpieczeństwa Statek/Terminal)

**Part 'A' - Bulk Liquid General – Physical Checks**
(Część ‘A’ Sprawdzenia ogólne dla ładunków płynnych – fizyczna weryfikacja)

<table>
<thead>
<tr>
<th>No. (Lp.)</th>
<th>General (Pytania ogólne)</th>
<th>Ship (Statek)</th>
<th>Terminal (Terminal)</th>
<th>Code (Kod)</th>
<th>Remarks (Uwagi)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1. There is safe access between the ship and shore. (Zapewniono bezpieczny dostęp pomiędzy statkiem i nabrzeżem).</td>
<td></td>
<td></td>
<td>R</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>The ship is securely moored. (Statek został bezpiecznie zacumowany).</td>
<td></td>
<td></td>
<td>R</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>The agreed ship/shore communication system is operative. (Uzgodniony system łączności statek/terminal jest sprawny).</td>
<td></td>
<td></td>
<td>A R</td>
<td>System:</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Backup System:</td>
</tr>
<tr>
<td>4</td>
<td>Emergency towing-off pennants are correctly rigged and positioned. (Awaryjne liny holownicze zostały prawidłowo zamocowane).</td>
<td></td>
<td></td>
<td>R</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>The ship’s fire hoses and fire-fighting equipment are positioned and ready for immediate use. (Statkowe węży i sprzęt p.poż. są właściwie rozlokowane).</td>
<td></td>
<td></td>
<td>R</td>
<td></td>
</tr>
<tr>
<td>No.</td>
<td>Statement</td>
<td>Language</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>-----</td>
<td>---------------------------------------------------------------------------</td>
<td>--------------------------------------------------------------------------</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>The terminal’s fire-fighting equipment is positioned and ready for immediate use.</td>
<td>(Sprzęt p.poż. terminalu jest gotowy do użycia).</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>The ship’s cargo and bunker hoses, pipelines and manifolds are in good condition, properly rigged and appropriate for the service intended.</td>
<td>(Statkowe węże ładunkowe i bunkrowe oraz rurociągi i manifoldy są w dobrym stanie – gotowe do użycia).</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>The terminal’s cargo and bunker hoses or arms are in good condition, properly rigged and appropriate for the service intended.</td>
<td>(Węże ładunkowe i bunkrowe oraz rurociągi i manifoldy terminalu są w dobrym stanie – gotowe do użycia).</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>The cargo transfer system is sufficiently isolated and drained to allow safe removal of blank flanges prior to connection.</td>
<td>(System ładunkowy statku jest zdrenowany i odizolowany, aby umożliwić bezpieczne usunięcie flansz zaślepiających).</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Scuppers and save-alls on board are effectively plugged and drip trays are in position and empty.</td>
<td>(Szpigaty są odpowiednio zakorkowane, a wanienki przeciwrozlewowe puste).</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Temporarily removed scupper plugs will be constantly monitored.</td>
<td>(Czasowa rozszczelnione szpigaty będą stale monitorowane).</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No.</td>
<td>Description</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td>-----</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Shore spill containment and sumps are correctly managed. (Wanny i inne przestrzenie przeciwrozlewowe terminalu są właściwie przygotowane).</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>The ship’s unused cargo and bunker connections are properly secured with blank flanges fully bolted. (Nieużywane linie ładunkowe i bunkrowe są odpowiednio zaślepione – wszystkie śruby w miejscu).</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>The terminal’s unused cargo and bunker connections are properly secured with blank flanges fully bolted. (Nieużywane linie ładunkowe i bunkrowe są odpowiednio zaślepione – wszystkie śruby w miejscu).</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>All cargo, ballast and bunker tank lids are closed. (Wszystkie włazy do zbiorników ładunkowych, balastowych i paliwowych są zamknięte).</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>Sea and overboard discharge valves, when not in use, are closed and visibly secured. (Zawory wody morskiej, które nie są w użyciu są zamknięte i zabezpieczone).</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>All external doors, ports and windows in the accommodation, stores and machinery spaces are closed. Engine room vents may be open. (Wszystkie drzwi, okna i otwory nadbudówki i siłowni są zamknięte – wentylacja siłowni może być otwarta).</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>The ship’s emergency fire control plans are located externally. (Statkowe plany p.poż. znajdują się w zewnetrzu).</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
If the ship is fitted, or is required to be fitted, with an inert gas system (IGS), the following points should be physically checked:

(Jeśli statek jest wyposażony lub wymagane jest by był wyposażony w system gazu obojętnego, następujące informacje powinny zostać fizycznie zweryfikowane):

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>19</td>
<td>Fixed IGS pressure and oxygen content recorders are working. (Stały pomiar ciśnienia i zawartości tlenu w gazie obojętnym działa i jest dostępny).</td>
<td>R</td>
</tr>
<tr>
<td>20</td>
<td>All cargo tank atmospheres are at positive pressure with oxygen content of 8% or less by volume. (Zawartość tlenu w zbiornikach ładunkowych wynosi mniej niż 8% przy pozytywnym ciśnieniu).</td>
<td>P R</td>
</tr>
</tbody>
</table>

Part ‘B’ – Bulk Liquid General – Verbal Verification
(Część ‘B’ - Sprawdzenia ogólne dla ładunków ciekłych – weryfikacja słowna)

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>21</td>
<td>The ship is ready to move under her own power. (Statek jest gotowy do manewrowania za pomocą własnego napędu).</td>
<td>P R</td>
</tr>
<tr>
<td>22</td>
<td>There is an effective deck watch in attendance on board and adequate supervision of operations on the ship and in the terminal. (Na pokładzie statku znajduje się efektywna wachta ładunkowa i jest zapewniony właściwy nadzór nad wyładunkiem ze strony statku i terminala).</td>
<td>R</td>
</tr>
<tr>
<td>23</td>
<td>There are sufficient personnel on board and ashore to deal with an emergency. (Wystarczająca liczba osób na statku i terminalu do działania w sytuacjach awaryjnych).</td>
<td>R</td>
</tr>
<tr>
<td>24</td>
<td>The procedures for cargo, bunker and ballast handling have been agreed. (Procedury dla operacjiụ)</td>
<td>A R</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
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<td>---</td>
</tr>
<tr>
<td>25</td>
<td><strong>The emergency signal and shutdown procedure to be used by the ship and shore have been explained and understood.</strong> (Sygnały alarmowe i procedura awaryjnego przerwania wyładunku zostały wyjaśnione i przyjęte do wiadomości).</td>
<td>A</td>
</tr>
<tr>
<td>26</td>
<td><strong>Material Safety Data Sheets (MSDS) for the cargo transfer have been exchanged where requested.</strong> (Karty substancji niebezpiecznych zostały wymienione zgodnie z życzeniem stron).</td>
<td>P R</td>
</tr>
<tr>
<td>27</td>
<td><strong>The hazards associated with toxic substances in the cargo being handled have been identified and understood.</strong> (Niebezpieczeństwa związane z wyładunkiem LNG zostały zidentyfikowane).</td>
<td>H₂S Content: (Stężenie H₂S) Benzene Content (Stęż. benzenu)</td>
</tr>
<tr>
<td>28</td>
<td><strong>An International Shore Fire Connection has been provided.</strong> (Międzynarodowy łącznik pożarowy jest dostępny).</td>
<td></td>
</tr>
<tr>
<td>29</td>
<td><strong>The agreed tank venting system will be used.</strong> (Uzgodniony system wentylacji zbiorników).</td>
<td>A R Method:</td>
</tr>
<tr>
<td>30</td>
<td><strong>The requirements for closed operations have been agreed.</strong> (Wymogi odnośnie “operacji zamkniętej” zostały uzgodnione).</td>
<td>R</td>
</tr>
<tr>
<td>31</td>
<td><strong>The operation of the P/V system has been verified.</strong> (Działanie system P/V zostało zweryfikowane).</td>
<td></td>
</tr>
<tr>
<td>No.</td>
<td>Statement</td>
<td>Status</td>
</tr>
<tr>
<td>-----</td>
<td>---------------------------------------------------------------------------</td>
<td>--------</td>
</tr>
<tr>
<td>32</td>
<td>Where a vapour return line is connected, operating parameters have been agreed. (Gdy linia powrotu par ładunku jest podłączona uzgodniono jej parametry operacyjne).</td>
<td>A R</td>
</tr>
<tr>
<td>33</td>
<td>Independent high level alarms, if fitted, are operational and have been tested. (Przetestowano działanie niezależnego systemu ostrzegania przed wysokim poziomem zbiorników).</td>
<td>AR</td>
</tr>
<tr>
<td>34</td>
<td>Adequate electrical insulating means are in place in the ship/shore connection. (Zapewniono wyrównanie ładunków elektrycznych między statkiem, a terminaliem).</td>
<td>AR</td>
</tr>
<tr>
<td>35</td>
<td>Shore lines are fitted with a non-return valve, or procedures to avoid back filling have been discussed. (Linie ładunkowe terminalu posiadają zawory zwrotne lub uzgodniono procedurę zapobiegania cofaniu się ładunku).</td>
<td>PR</td>
</tr>
<tr>
<td>36</td>
<td>Smoking rooms have been identified and smoking requirements are being observed. (Wyznaczono pomieszczenia dla palących).</td>
<td>AR</td>
</tr>
<tr>
<td>37</td>
<td>Naked light regulations are being observed. (Zakaz używania otwartego ognia jest przestrzegany).</td>
<td>AR</td>
</tr>
<tr>
<td>38</td>
<td>Ship/Shore telephones, mobile phones and pager requirements are being observed. (Zakaz używania telefonów komórkowych i pagerów jest przestrzegany).</td>
<td>AR</td>
</tr>
<tr>
<td>39</td>
<td>Hand torches (flashlights) are of an approved type. (Latarki używanie na statku i na terminalu są właściwego typu).</td>
<td></td>
</tr>
<tr>
<td>40</td>
<td>Fixed VHF/UHF transceivers and AIS equipment are on the correct power mode or switched off. (Stacje VHF/UHF i AIS mają zredukowaną moc emisji lub są wyłączone).</td>
<td></td>
</tr>
<tr>
<td>41</td>
<td>Portable VHF/UHF transceivers are of an approved type. (Przenośne urządzenia VHF/UHF są odpowiedniego typu).</td>
<td></td>
</tr>
<tr>
<td>42</td>
<td>The ship’s main radio transmitter aerials are earthed and radars are switched off. (Anteny MF/HF są uziemione, a radary wyłączone).</td>
<td></td>
</tr>
<tr>
<td>43</td>
<td>Electric cables to portable electrical equipment within the hazardous area are disconnected from power. (Przenośne urządzenia elektryczne w strefie niebezpiecznej są odłączone od sieci).</td>
<td></td>
</tr>
<tr>
<td>44</td>
<td>Window type air conditioning units are disconnected. (Agregaty klimatyzatorów znajdujące się na zewnątrz są wyłączone).</td>
<td></td>
</tr>
<tr>
<td>45</td>
<td>Positive pressure is being maintained inside the accommodation, and air conditioning intakes, which may permit the entry of cargo vapours, are closed. (Wewnątrz nadbudówki jest utrzymywane dodatnie ciśnienie, a wloty powietrza do klimatyzacji, które mogą spowodować zassanie par ładunku są zamknięte).</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Measures have been taken to ensure sufficient mechanical ventilation in the pumproom. (Przedsięwzięto środki w celu zapewnienia wystarczającej wentylacji pompowni).</td>
<td></td>
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<td>---</td>
<td>----------------------------------------------------------------------------------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>46</td>
<td><strong>R</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>There is provision for an emergency escape. (Istnieje alternatywna droga ewakuacji).</td>
<td></td>
</tr>
<tr>
<td>47</td>
<td><strong>A</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>The maximum wind and swell criteria for operations have been agreed. (Graniczne wartości wiatru i falowania zostały uzgodnione).</td>
<td></td>
</tr>
<tr>
<td>48</td>
<td><strong>A</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Security protocols have been agreed between the Ship Security Officer and the Port Facility Security Officer, if appropriate. (Zasady ochrony zostały uzgodnione między SSO, a PFSO)</td>
<td></td>
</tr>
<tr>
<td>49</td>
<td><strong>A P</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Where appropriate, procedures have been agreed for receiving nitrogen supplied from shore, either for inerting or purging ship’s tanks, or for line clearing into the ship. (Uzgodniono procedury azotowania do inertowania lub przedmuchu zbiorników)</td>
<td></td>
</tr>
<tr>
<td>50</td>
<td><strong>A P</strong></td>
<td></td>
</tr>
</tbody>
</table>

If the ship is fitted, or is required to be fitted, with an inert gas system (IGS) the following statements should be addressed:

(Jeśli statek jest wyposażony lub jest wymagane by był wyposażony w system gazu obojętnego, następujące fakty powinny zostać potwierdzone):

<table>
<thead>
<tr>
<th></th>
<th>The IGS is fully operational and in good working order. (System gazu obojętnego jest w pełni sprawny i w dobrym stanie technicznym)</th>
</tr>
</thead>
<tbody>
<tr>
<td>51</td>
<td><strong>P</strong></td>
</tr>
<tr>
<td></td>
<td>Deck seals, or equivalent, are in good working order. (Deck seal lub jego odpowiednik są w dobrym stanie technicznym).</td>
</tr>
<tr>
<td>52</td>
<td><strong>R</strong></td>
</tr>
</tbody>
</table>

No. PE-PP-10-1 – Ver. 3.0
53. Liquid levels in pressure/vacuum breakers are correct. (Poziomy cieczy w P/V brakerach są prawidłowe).

54. The fixed and portable oxygen analysers have been calibrated and are working properly. (Stacjonarne i przenośne analizatory atmosfery zostały skalibrowane i działają prawidłowo).

55. All the individual tank IG valves (if fitted) are correctly set and locked. (Indywidualne zawory odcinające gazu obojętnego (Jeśli zainstalowane) są odpowiednio ustawione i zablokowane).

56. All personnel in charge of cargo operations are aware that, in the case of failure of the inert gas plant, discharge operations should cease and the terminal be advised. (Personel nadzorujący operacje ładunkowe jest świadomy konieczności przerwania operacji i powiadomienia terminalu w przypadku awarii systemu gazu obojętnego).

The COW section – Intentionally omitted as N/A throughout for LNG operations. (Część dotycząca COW została celowo pominięta, gdyż nie odnosi się do operacji LNG)

Part ‘C’ – Bulk Liquid Chemicals – Verbal Verification – Intentionally omitted as N/A throughout for LNG operations. (Część ‘C’ – Ciekłe chemikalia – weryfikacja słowna – celowo pominięto jako nie odnoszące się do operacji LNG)


1. Material Safety Data Sheets are available giving the necessary data for the safe handling of the cargo. (Karty substancji...
<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>A manufacturer's inhibition certificate, where applicable, has been provided. (Certyfikat inhibitora wydany przez załadowcę, gdy jest to właściwe).</td>
<td>P</td>
</tr>
<tr>
<td>3</td>
<td>The water spray system is ready for immediate use. (System zraszaczy pokładowych gotowy do natychmiastowego użycia).</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>There is sufficient suitable protective equipment (including self-contained breathing apparatus) and protective clothing ready for immediate use. (Dostępna jest wystarczająca ilość odpowiedniego wyposażenia ochronnego (włączając aparaty oddechowe) i ubrań ochronnych).</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Hold and inter-barrier spaces are properly inerted or filled with dry air, as required. (Hold space i IBS są właściwie zainertowane/zaazotowane lub wypełnione suchym powietrzem).</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>All remote control valves are in working order. (Wszystkie zawory zdalnie kontrolowane są w dobrym stanie technicznym).</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>The required cargo pumps and compressors are in good order, and the maximum working pressures have been agreed between ship and shore. (Pompy ładunkowe i kompresory są w pełni sprawne, a maksymalne ciśnienia operacyjne zostały uzgodnione między statkiem, a terminalem).</td>
<td>A</td>
</tr>
<tr>
<td><strong>No.</strong></td>
<td><strong>Text</strong></td>
<td></td>
</tr>
<tr>
<td>--------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Re-liquefaction or boil-off control equipment is in good order. (System ponownego skraplania BOG oraz system kontroli przepływu i ciśnienia BOG są w pełni sprawne).</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>The gas detection equipment has been properly set for the cargo, is calibrated, has been tested and inspected and is in good order. (Urządzenia wykrywacze gazu zostały prawidłowo ustawione, skalibrowane, przetestowane, sprawdzone i są w dobrym stanie technicznym).</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Cargo system gauges and alarms are correctly set and in good order. (Wskaźniki poziomu ładunku i alarmy są odpowiednio ustawione i w pełni sprawne).</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Emergency shutdown systems have been tested and are working properly. (Systemy awaryjnego zatrzymania wyładunku zostały przetestowane i działają prawidłowo).</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Ship and shore have informed each other of the closing rate of ESD valves, automatic valves or similar devices. (Przedstawiciele statku i terminal poinformowali się wzajemnie o czasach zamknięcia zaworów ESD, zaworów automatycznych lub podobnych urządzeń).</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Information has been exchanged between ship and shore on the maximum / minimum temperatures/pressures of the cargo to be handled. (Wymieniono informacje statek /terminal na</td>
<td></td>
</tr>
</tbody>
</table>
temat maksymalnych/minimalnych temperatur/ciśnień ładunku i BOG).

14 Cargo tanks are protected against inadvertent overfilling at all times while any cargo operations are in progress. (Zbiorniki ładunkowe są chronione przed przelaniem w każdym momencie trwania operacji ładunkowej.)

15 The compressor room is properly ventilated, the electrical motor room is properly pressurised and the alarm system is working. (Pomieszczenie kompresorów jest odpowiednio wentylowane, pomieszczenie silników kompresorów znajduje się pod odpowiednim ciśnieniem, a airlock alarm działa prawidłowo).

16 Cargo tank relief valves are set correctly and actual relief valve settings are clearly and visibly displayed. (Record settings below). (Zawory bezpieczeństwa na zbiornikach ładunkowych są właściwie ustawione, a wartość ciśnienia jest na nich wyraźnie oznaczona - poniżej należy zapisać wartości dla zaworów na poszczególnych zbiornikach).

<table>
<thead>
<tr>
<th>Tank # 1</th>
<th>Tank # 2</th>
<th>Tank # 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tank # 4</td>
<td>Tank # 5</td>
<td>Tank # 6</td>
</tr>
</tbody>
</table>

DECLARATION

We, the undersigned, have checked the above items in Parts A and B, and where appropriate Part C or D, in accordance with the instructions, and have satisfied ourselves that the entries we have made are correct to the best of our knowledge. We have also made arrangements to carry out repetitive checks as necessary and agreed that those items with code ‘R’ in the Check-List should be re-checked at
intervals not exceeding ____ hours. If to our knowledge the status of any item changes, we will immediately inform the other party.

(Oświadczenie)
(My niżej podpisani zweryfikowaliśmy zapisy części A i B oraz, gdy było to właściwe dla danej operacji części C lub D, zgodnie z instrukcją wypełniania SSSCL i upewniliśmy się, że zapisy jakich dokonaliśmy są poprawne i zgodnie z naszą najlepszą wiedzą. Zgodziliśmy się także dokonywać okresowych sprawdzeń stanu faktycznego wszystkich zapisów oznaczonych literą ‘R’ – powinny one być weryfikowane w odstępach czasowych nie przekraczających ____ godzin. Jeśli zgodnie z wiedzą którejś ze stron stan faktyczny jakiegokolwiek ustalenia/zapisu ulegnie zmianie zobowiązuje się ona niezwłocznie powiadomić o tym drugą stronę).

<table>
<thead>
<tr>
<th>For Ship (Upoważniony przedstawiciel statku)</th>
<th>For Terminal (Upoważniony przedstawiciel terminalu)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name:</td>
<td>Name:</td>
</tr>
<tr>
<td>Rank:</td>
<td>Position or Title:</td>
</tr>
<tr>
<td>Signature:</td>
<td>Signature:</td>
</tr>
<tr>
<td>Date:</td>
<td>Date:</td>
</tr>
<tr>
<td>Time:</td>
<td>Time:</td>
</tr>
</tbody>
</table>

Record of repetitive checks:

<table>
<thead>
<tr>
<th>Date:</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Time:</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Initials for Ship:</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Initials for Shore:</th>
</tr>
</thead>
</table>
### CHECKLIST Pre-discharge meeting – Meeting Agenda

<table>
<thead>
<tr>
<th>LNG Terminal Świnoujście</th>
<th>Ship:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date:</td>
<td></td>
</tr>
</tbody>
</table>

#### GENERAL INFORMATION

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>VHF communication has been checked</td>
</tr>
<tr>
<td>2</td>
<td>Hot line and telephone line have been checked</td>
</tr>
<tr>
<td>3</td>
<td>Is gas burning planned during the unloading?</td>
</tr>
<tr>
<td>4</td>
<td>CTMS to be opened (before the ESD test)</td>
</tr>
<tr>
<td>5</td>
<td>Warm ESD will be given off by the</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Number of ESD Tests</td>
</tr>
<tr>
<td>7</td>
<td>Pressure in the ship’s tanks</td>
</tr>
<tr>
<td>8</td>
<td>Pressure in the terminal’s tanks</td>
</tr>
</tbody>
</table>

#### VAPOR RETURN

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>9</td>
<td>Vapor return valve open after CTMS (before the unloading test)</td>
</tr>
<tr>
<td>10</td>
<td>Vapor flow control at the side of the</td>
</tr>
<tr>
<td>11</td>
<td>Maximum vapor pressure</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### COOLING

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>12</td>
<td>Rate of arms cooling flow</td>
</tr>
<tr>
<td>13</td>
<td>Rate of arms cooling temperature</td>
</tr>
<tr>
<td>14</td>
<td>Number of arms used in the unloading</td>
</tr>
</tbody>
</table>

#### UNLOADING

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td>Amount of cargo to be unloaded</td>
</tr>
<tr>
<td>16</td>
<td>Unloading rate</td>
</tr>
<tr>
<td>17</td>
<td>Single pump capacity</td>
</tr>
<tr>
<td>18</td>
<td>Pressure of pump shutdown</td>
</tr>
</tbody>
</table>
19 Number of pumps/tanks unloaded simultaneously
20 Unloading rate control
21 Expected time of unloading
22 Expected time to completion from ramp down
23 Information about the start of each pump 5 minutes before
24 Information about the stop of each pump 5 minutes before
25 Information about the stabilization of the unloading rate
26 Information about 25%, 50%, and 75% of the total unloading volume
27 Information about the halt of each pump 5 minutes before

**AFTER THE UNLOADING**

27 Expected time of arms drainage
28 Vapor return valve closed before CTM (after the unloading)
29 Expected time of N2 blow-through
30 Expected time of arms disconnection

**TERMINAL LOADING MASTER**

**SHIP’S MASTER/CHIEF OFFICER**
Safety Letter

Dear Sir,

Responsibility for the safe conduct of operations while your ship is at this terminal rests jointly with you, as Master of the ship, and with the responsible Terminal Representative. We wish, therefore, before operations start, to seek your full cooperation and understanding on the safety requirements set out in the Ship/Shore Safety Check-List, which are based on safe practices that are widely accepted by the oil and tanker industries. We expect you, and all under your command, to adhere strictly to these requirements throughout your ship’s stay alongside this terminal and we, for our part, will ensure that our personnel do likewise, and co-operate fully with you in the mutual interest of safe and efficient operations. Before the start of operations, and from time to time thereafter, for our mutual safety, a member of the terminal staff, where appropriate together with a Responsible Officer, will make a routine inspection of your ship to ensure that elements addressed within the scope of the Ship/Shore Safety Check-List are being managed in an acceptable manner. Where corrective action is needed, we will not agree to operations commencing or, should they have been started, we will require them to be stopped. Similarly, if you consider that safety is being endangered by any action on the part of our staff or by any equipment under our control, you should demand immediate cessation of operations. There can be no compromise with safety. Please acknowledge receipt of this letter by countersigning and returning the attached copy.

Terminal Representative

Terminal Representative on duty is:
Position or Title:
Contact Details:
J.5 Appendix No. 5 – Marine Operations Algorithm – PE-PP-10-1-Z-1
LNG Carrier Name and IMO number:
Cargo ID:
Load Port:
Load port Departure Time and Date:
Estimated Time of Arrival (ETA) at the Pilot Boarding Station:
Quantity of LNG loaded in m³ (total):
Vapour pressure:
Temperature of the liquid:
Quality of the LNG loaded:
Value at Load Port:
Wobbe Index:
Gross calorific value of LNG:
Density of LNG at Load Port:
PPM sulfur in LNG at Load port:

<table>
<thead>
<tr>
<th>Components</th>
<th>% Mol of chemical components</th>
<th>Units</th>
<th>Value at Load Port</th>
</tr>
</thead>
<tbody>
<tr>
<td>Methane (CH4)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ethane (C2H6)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Propane (C3H8)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Iso Butane (i-C4H10)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N-Butane (n-C4H10)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Iso Pentane (i-C5H12)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N-Pentane (n-C5H12)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N-Hexane (n-C6H14)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nitrogen (N2)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oxygen (O2)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Carbon dioxide (CO2)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Quantity of LNG to be unloaded in m³ (less fuel & boil off during the voyage):

Quantity of LNG to be unloaded in MWh (less fuel & boil off during the voyage):

Other remarks (e.g. factors affecting voyage time or unloading rate):
<table>
<thead>
<tr>
<th>Question</th>
<th>LNG Carrier Response</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name of LNG Carrier</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Call Sign</td>
<td></td>
<td></td>
</tr>
<tr>
<td>IMO No.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Country of Registry</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Master’s name</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Name of Owner / Operator (Transporter)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Number of persons onboard</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ETA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Current position, course and speed</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LNG consumed since last port</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Last Port of Call</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Date of International Oil Pollution Prevention Certificate (IOPP)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Confirm that Passage Plan has been prepared for the voyage and covers the period berth to berth</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Confirm that the primary and secondary cargo measurement systems are functioning</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Confirm that all cargo monitoring systems are operational and that void space atmosphere monitoring systems are functioning.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anticipated quantity to discharge</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sailing displacement</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anticipated berthing displacement</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Distance of manifold vapour connection to stern, bow, and bridge</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Confirm that all moorings are on powered reels but will not be left on ‘auto’ once vessel is moored</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anticipated cargo discharge rate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anticipated Discharge Time</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Description</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-----------------------------------------------------------------------------</td>
<td>---</td>
<td></td>
</tr>
<tr>
<td>Ship’s deficiencies that would affect port performance including the need for repairs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Requirements for nitrogen, fuel, water, stores garbage removal that will be taken from third parties</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cargo density in KG/M³</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cargo Temperature</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anticipated Saturated Vapour Pressure on arrival</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ship Inmarsat No’s: Voice No.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Voice No.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fax No.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Telex No.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ship GSM : Mobile Phone No</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ship Email:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MMSI No.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Appendix No. 8 – Key technical compatibility data (for details please refer to the latest PLNG SSI Check List)
Terminal mooring hook and fenders data in metres (for Optimoor input)

**Berth Heading 368° deg**

<table>
<thead>
<tr>
<th>Mooring / Breasting dolphin</th>
<th>MD1</th>
<th>MD2</th>
<th>MD3</th>
<th>BD1</th>
<th>BD2</th>
<th>BD3</th>
<th>BD4</th>
<th>MD4</th>
<th>MD5</th>
<th>MD6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Hooks</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>SWL of Hooks (tonnes)</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Distance from Vapour Line (m)</td>
<td>-200.0</td>
<td>-150.0</td>
<td>-100.0</td>
<td>-60.0</td>
<td>-37.0</td>
<td>37.0</td>
<td>60.0</td>
<td>100.0</td>
<td>150.0</td>
<td>200.0</td>
</tr>
<tr>
<td>Distance from Berthing Line (m)</td>
<td>37.1</td>
<td>47.2</td>
<td>47.2</td>
<td>4.7</td>
<td>4.7</td>
<td>4.7</td>
<td>4.7</td>
<td>47.2</td>
<td>47.2</td>
<td>37.1</td>
</tr>
<tr>
<td>Height above datum (m)</td>
<td>3.7</td>
<td>3.7</td>
<td>3.7</td>
<td>6.7</td>
<td>6.7</td>
<td>6.7</td>
<td>6.7</td>
<td>3.7</td>
<td>3.7</td>
<td>3.7</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Fender</th>
<th>BD1</th>
<th>BD2</th>
<th>BD3</th>
<th>BD4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distance from Vapour Line (m)</td>
<td>-60.0</td>
<td>-37.0</td>
<td>37.0</td>
<td>60.0</td>
</tr>
<tr>
<td>Height above datum (m)</td>
<td>5.7</td>
<td>5.7</td>
<td>5.7</td>
<td>5.7</td>
</tr>
<tr>
<td>Face Contact Area (m²)</td>
<td>16.63</td>
<td>16.63</td>
<td>16.63</td>
<td>16.63</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Fender</th>
<th>X-Dist to Origin</th>
<th>Ht above Datum</th>
<th>Width Along Side</th>
<th>Face Contact Area (m²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>aa</td>
<td>-60.0</td>
<td>5.7</td>
<td>3.4</td>
<td>16.6</td>
</tr>
<tr>
<td>bb</td>
<td>-37.0</td>
<td>5.7</td>
<td>3.4</td>
<td>16.6</td>
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</tbody>
</table>
Appendix 4 Berth diagram and fender curves
J.9 Appendix No. 9 – Unloading arms work range and configurations – PE-PP-10-1-Z-2

**Vertical:**

[Diagram of unloading arms work range and configurations]
Possible configurations of the manifolds and the unloading arms:
J.10 Appendix No. 10 Quick release hook and fender – PE-PP-10-1-Z3
J.11 Appendix No. 11 – Schematics and parameters of the gangway tower and the gangway, the range and SWL of the crane – PE-PP-10-1-W3

Gangway tower and gangway.
Gangway working range
Arms work range and crane lifting height
J.12 Appendix No. 12 – LNG carrier area evacuation route – PE-PP-10-1-W4

MAIN MUSTER POINT

ALTERNATIVE MUSTER POINT
J.13 Appendix No. 13 – Jetty readiness checklist – PE-PP-10-1-F7

Lista kontrolna nr /  
(Check List no.)
Zintegrowanego Morskiego Systemu Bezpieczeństwa Nawigacyjnego (ZMSBN)  
(Pilotage, Navigation & Docking System)

Lista zawiera wyniki kontroli stanu technicznego ZMSBN przeprowadzonej na 96 godzin przed planowanym zawinięciem zbiornikowca LNG do portu zewnętrznego w Świnoujściu (The following Check List contains the results of PNDS technical checks conducted 96 hours before LNGc arrival)
Data i godzina wykonania kontroli:  
(Date and time of completion)

Data i godzina planowanego zawinięcia zbiornikowca LNG (Date and time of LNGc arrival)..............................

<table>
<thead>
<tr>
<th>Przedmiot sprawdzenia</th>
<th>Wynik sprawdzenia</th>
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<tbody>
<tr>
<td><strong>1. Haki (Hooks)</strong></td>
<td><strong>1.1. Smarowanie zespołów hakowych (Mooring hooks lubrication)</strong></td>
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<tr>
<td></td>
<td><strong>1.2. Działanie elementów hakowych (test zwalniania ręcznego, zwolnienie lokalne i zdalne) (QRH local and remote release)</strong></td>
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<tr>
<td></td>
<td><strong>1.3. Bloki udarowe (Hammer blocks)</strong></td>
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<td></td>
<td><strong>1.4. Linki zwalniania haków (Hook release wires)</strong></td>
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<tr>
<td></td>
<td><strong>1.5. Stacje sterujące systemu zwalniania haków, wirtualny pulpıt zdalnego zwalniania haków (Hook release control stations, remote release virtual control station)</strong></td>
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<tr>
<td></td>
<td><strong>1.6. Ogniwa obciążnikowe (load cells)</strong></td>
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<tr>
<td></td>
<td><strong>1.7. Sterowniki systemu monitorowania obciążenia haków, światła ostrzegawcze obciążenia alarmowego (Tension monitorig system, hooks overload warning lights)</strong></td>
</tr>
<tr>
<td></td>
<td><strong>1.8. Odczyty z systemu monitorowania obciążenia haków (Tension monitoring system readings)</strong></td>
</tr>
<tr>
<td></td>
<td><strong>1.9. Powłoki malarskie ochronne (Protective coatings)</strong></td>
</tr>
<tr>
<td><strong>2. Kabestany (Capstans)</strong></td>
<td><strong>2.1. Zasilanie kabestanów (Capstans power supply)</strong></td>
</tr>
<tr>
<td></td>
<td><strong>2.2. Działanie silników kabestanów (Capstans electric motors)</strong></td>
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</tbody>
</table>
2.3. Zabezpieczenia przeciwprzeciążeniowe (Overload protection)  
2.4. Stan izolacji przewodów elektrycznych (Electrical wires insulation)  
2.5. Dławiki kablowe (Cable glands)  
2.6. Obudowy układów sterowania (Control units housing)  
2.7. Hamulce kabestanów (Capstans brakes)  
2.8. Obwody sterowania kabestanami (przetworniki nożne, wybieraki kierunku, wyłączniki awaryjne) (Capstans control circuits, direction)  
2.9. Nagrzewnice antykondensacyjne (anti-condensation heaters)  
2.10. Desykant w obudowach kabestanów (Dessicant in capstans housings)  
2.11. Powłoki malarskie ochronne (Protective coatings)  

3. Tablica wyświetlacz (SmartDock display)  
3.1. Oczyszczenie tablicy wyświetlacza (SmartDock display cleaning)  
3.2. Test wyświetlacza (SmartDock display test)  
3.3. Desykant w obudowie tablicy (Dessicant in display housing)  
3.4. Rotor elektryczny (Electical rotor)  

4. Czujniki podejścia statku (Ship approach sensors)  
4.1. Oczyszczenie okienek obudów czujników laserowych (Laser sensors windows cleaning)  
4.2. Desykant w obudowach czujników laserowych (Dessicant in laser sensors boxes)  
4.3. Odczyty z systemu wspomagania dobijania statku (SmartDock system readings)  

5. Stacja pogodowa (Weather station)  
5.1. Oczyszczenie czujnika stacji pogodowej (Weather station sensor cleaning)  
5.2. Odczyty ze stacji pogodowej (Weather station readings)  

6. Czujnik fali (Wave sensor)  
6.1. Desykant w obudowie czujnika fali (Dessicant in wave sensor box)  
6.2. Odczyty z czujnika fali (Wave sensor readings)  

7. Czujnik prądów morskich (Current sensor)  
7.1. Oczyszczenie czujnika prądów morskich (Current sensor cleaning)  
7.2. Odczyty z czujnika prądów morskich (Current sensor readings)
J.14 Appendix no. 14 – Hazardous zones around LNG carrier
K. Literature.

3. SIGTTO - LNG Operations in Port Areas (September 2003).
5. SIGTTO Training of Terminal Staff involved in Loading and Discharging Gas Carrier (1996).
10. OCIMF Marine Terminal Particulars Questionnaire (MTPQ).
14. Contingency Planning and Crew Response Guide for Gas Carrier Damage at Sea and in Port Approaches
15. Crew Safety Standards and Training for Large LNG Carriers
16. ESD Arrangements & Linked Ship/ Shore Systems for Liquefied Gas Carriers
17. Guide to Contingency Planning for Marine Terminals Handling Liquefied Gases in Bulk
18. Guide to Contingency Planning for the Gas Carrier Alongside and Within Port Limits, 2nd Ed
19. Guidelines for the Alleviation of Excessive Surge Pressures on ESD
20. Jetty Maintenance and Inspection Guide
22. Liquefied Gas Handling Principles on Ships and in Terminals - 3rd edition
23. LNG Operations in Port Areas
24. LNG Shipping Suggested Competency Standards 2008 - Second Edition
25. LNG Transfer Arms and Manifold Draining, Purging and Disconnection Procedure
26. Rapid Phase Transitions in LNG Carrier Manifold Drip Trays
27. Report on the Effects of Fire on LNG Carrier Containment Systems
28. Safe Havens for Disabled Gas Carriers
29. Sampling of Liquefied Gases - BSI Bulletin
30. Ship Vetting and its Application to LNG
31. Ship-Shore Compatibility Questionnaire
32. Site Selection and Design for LNG Ports and Jetties