



MONTOIR LNG TERMINAL

HANDBOOK



Last version is available on www.elengy.com or on request to the terminal.

April 2018

Summary

1. Introduction	2
2. Communications	3
2.1 Main contacts	3
2.2 VHF channels.....	4
2.3 Communications alongside	4
3. Pre-arrival procedures	5
4. Port environment and navigation	6
4.1 Vessel Traffic Service (VTS).....	6
4.2 Access fairway.....	7
4.3 Anchorage area	7
4.4 Tide and Current	7
4.5 Winds & weather forecasts	8
4.6 Depths	8
4.7 LNG vessels swinging area	9
4.8 Air draft and bridge of Saint-Nazaire	9
4.9 LNG carriers transit	10
4.10 Pilotage	11
4.11 Tugs	12
4.12 Mooring lines handlers (boatmen)	13
5. Berthing and mooring.....	14
5.1 Berths overview	14
5.2 Berthing aid system	15
5.3 Mooring Load Monitoring System (MLMS)	15
5.4 Shore lines.....	15
5.5 Mooring plans	16
5.6 Mooring instructions to Masters.....	19
6. Access to berths and vessels – visitors policy.....	20
6.1 Access to berths	20
6.2 Access to vessels & shore gangways arrangements.....	21
6.3 Visitors policy.....	22
7. Safety requirements	23
7.1 Vessel safety requirements	23
7.2 Vessel maintenance and repairs alongside.....	24
7.3 Ship shore bonding cable	24
7.4 Terminal Fire-fighting equipment	24

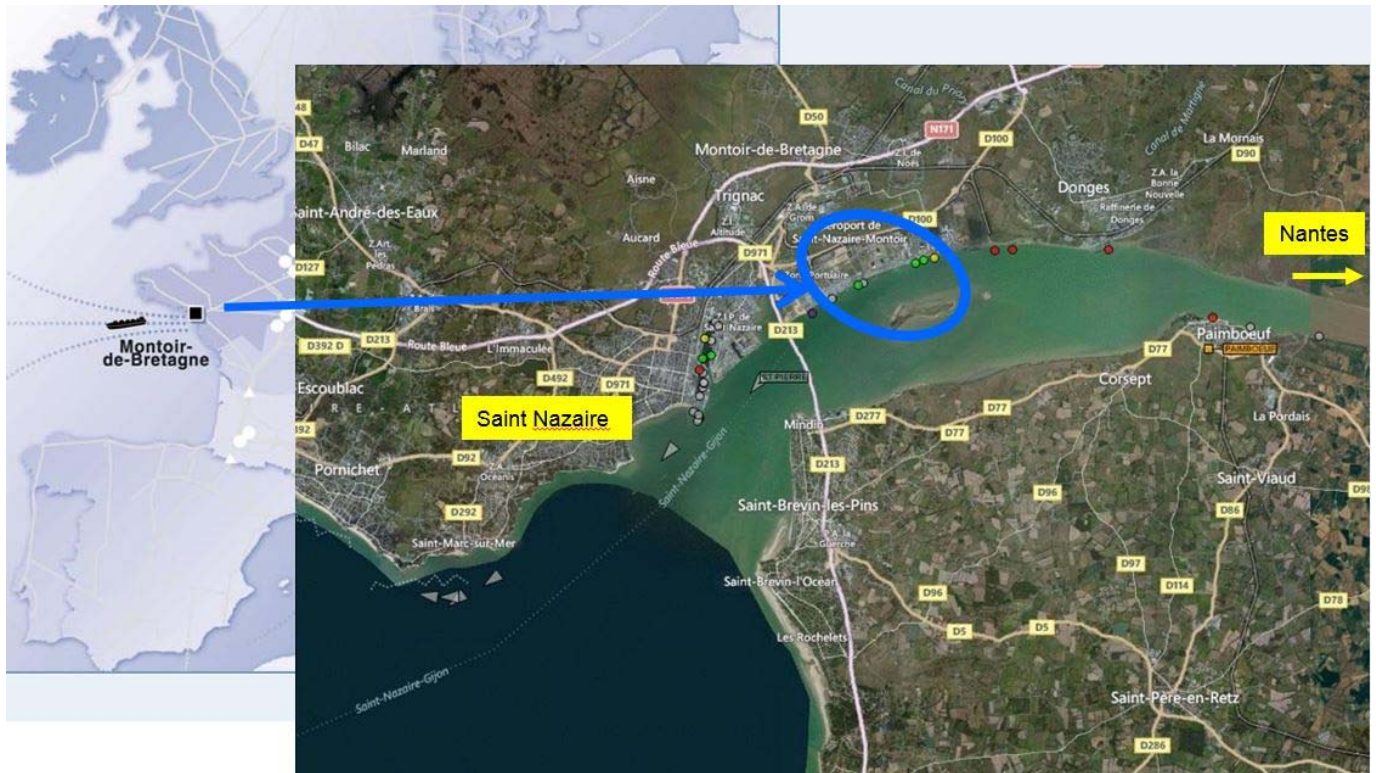
8. Emergency management	25
8.1 Emergency signals	25
8.2 Emergency services	25
8.3 Management of emergencies	26
8.4 Emergency departure	26
9. Cargo operations	27
9.1 Ship/Shore communications	27
9.2 Pre transfer meeting	28
9.3 LNG Custody transfer	28
9.4 LNG transfer arms	29
9.5 LNG transfer emergency shut down : ESD1 & ESD2	31
9.6 Unloading operations	32
9.7 Reloading operations	32
9.8 Transshipment operations	33
9.9 Management of evaporations (BOG)	33
9.10 Gassing-up operations	34
9.11 Cooling Down operations	34
9.12 Cargo Transfer interruption	34
9.13 End of Transfer	34
10. Services and supplies	35
11. Un-berthing and Departure	36
12. Abbreviations and appendixes lists	37

Document history

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1. Introduction

This document is a practical guide for LNG carriers calling at Montoir-de-Bretagne LNG terminal. The Terminal is located within the limits of Nantes Saint-Nazaire Port in the Loire River estuary, along the Western coast of France.



The LNG Terminal is owned and operated by Elengy (www.elengy.com).

This booklet is not exhaustive and does not replace any of the terminal and port procedures. It highlights the main information to prepare a call and provide safety information to the vessels.

LNG tankers are subject to approval prior to call the terminal. Information about vessel approval procedure, ship-shore compatibility study and ship scheduling conditions are available on Elengy website.

Ship approval procedure is available on the ELENKY website :

<https://www.elengy.com/en/contracts-and-operations/ship-related-procedures.html>

Local time :

UTC + 1 (winter time)

UTC + 2 (summer time: from the last Sunday of March to the last Sunday of October)

2. Communications

2.1 Main contacts

LNG Terminal

ELENGY – Terminal méthanier
Zone Portuaire
44500 Montoir-de-Bretagne – France
Tel : +33 (0)2 40 17 53 00
Operations : terminal.montoir@elengy.com
Security : gdfmmpfso@elengy.com

Elengy Head Office

For any commercial, scheduling or vetting questions regarding LNG terminal access:

ELENGY - Département Commercialisation et Programmation (DCP)
11 avenue Michel Ricard
92 270 Bois-Colombes - FRANCE
Scheduling team : operations@elengy.com
Commercial team : sales@elengy.com
Vetting team: vetting@elengy.com

Nantes- Saint Nazaire Port

HARBOUR OFFICE
3 bis boulevard de Verdun - BP 9
44 600 Saint-Nazaire - FRANCE
Tél +33 (0)2 40 45 39 00
Fax +33 (0)2 40 91 03 17
VHF Canal 14 *Channel 14*
e-mail: kplacement@nantes.port.fr

2.2 VHF channels

Channel 14	Loire Port Control – Harbour Master Office
Channel 12	Loire pilots
Channel 16	Safety Channel
Channel 23	Sea level and tide broadcast every 10 minutes in French and English

2.3 Communications alongside

PRIORITY	CONTACT	DETAILS
1	TERMINAL control room (UHF Walkie-talkie)	Channel 3
2	TERMINAL control room (Telephone)	+33 (0)2 40 17 54 42 or 54 54 42 (via SSL) +33 (0)2 40 17 54 44 or 54 54 44 (via SSL)
3	Terminal loading Master (Telephone)	+33 (0)2 40 17 54 43 or 54 54 43 (via SSL)
4	Terminal Main entry gate (Telephone)	+33 (0)2 40 17 53 00 or 54 53 00 (via SSL)
5	Vessel entry gate (Telephone)	+33 (0)2 40 17 54 08 or 54 54 08 (via SSL)
6	Terminal Loading Master (GSM)	+33 (0) 6 98 53 57 50
7	Harbour Master Office	VHF Channel 14
8	Terminal loading master (e-mail)	terminal.montoir@elengy.com
-	Vessel on berth 1	+33 (0)2 40 17 55 05 or 54 55 05 via SSL
-	Vessel on berth 2	+33 (0)2 40 17 55 06 or 54 55 06 via SSL

*SSL : Ship Shore Link.

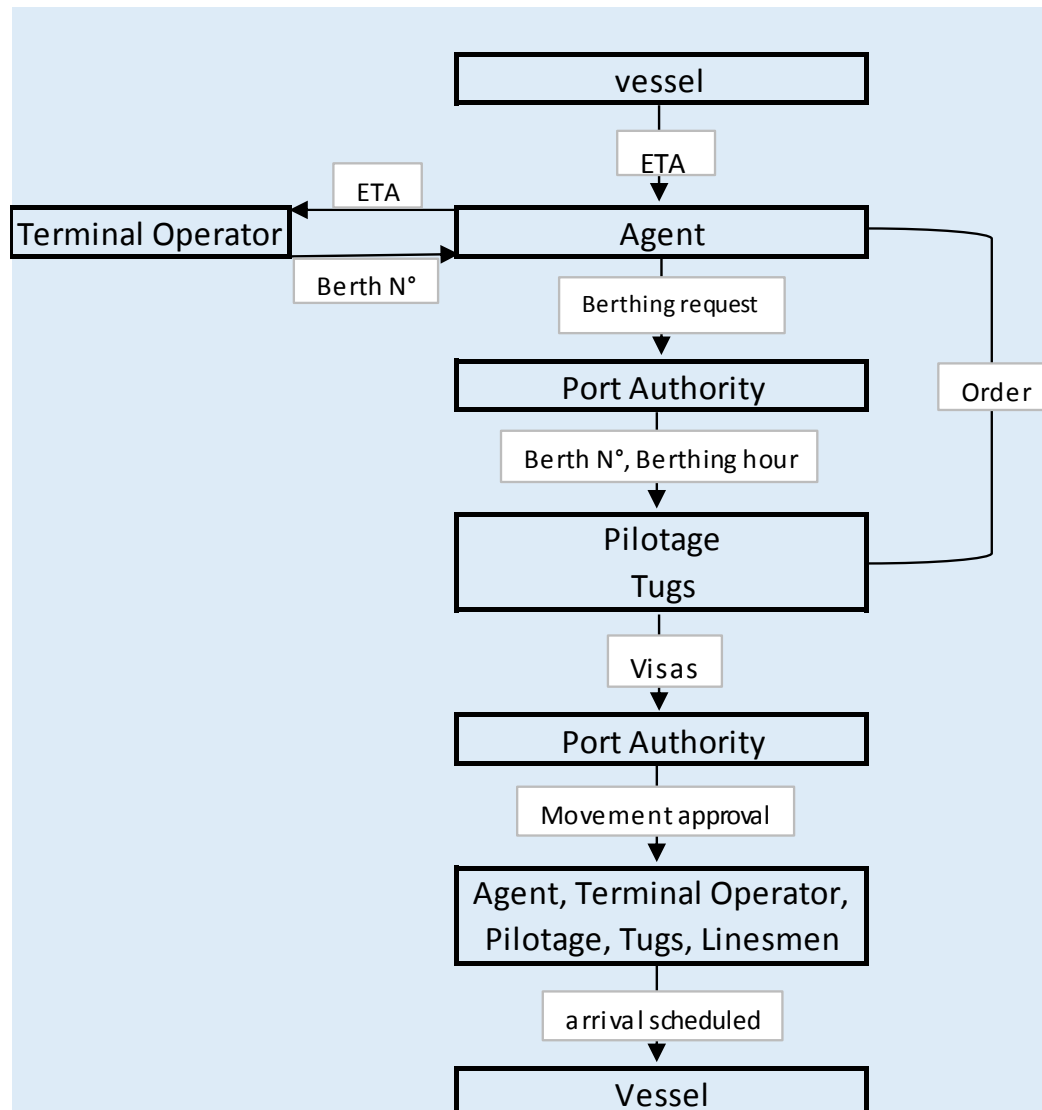
3. Pre-arrival procedures

Cargo operation plans

Cargo operation plans are sent before each call. Operation plans aim to complete this Handbook.

- Unloading **operation plan**
- Gassing up/Cool down/Reloading **operation plan**
- Transhipment **operation plan**

Port authority procedure for arrival request:

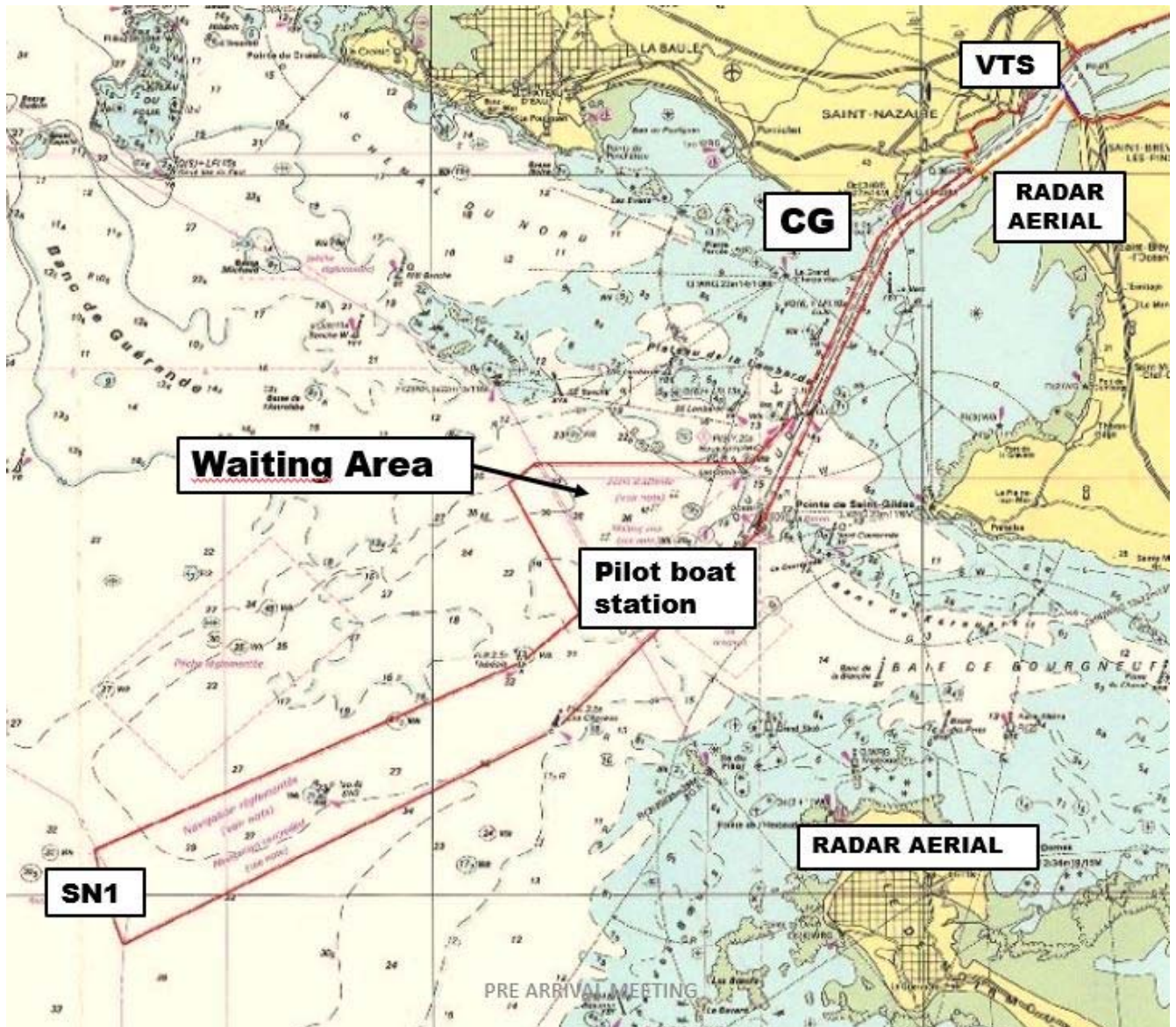


Security :

The DOS (Declaration of Security) shall be signed by the vessel and the Terminal representatives: on Vessel first call and/or each time the Vessel or Terminal ISPS level is changed, and then at least once a year.

The DOS must be signed by the Terminal and the Vessel by email exchange prior arrival. The email to be used for DOS exchange with the Terminal is: gdfmm.pfso@elengy.com

4. Port environment and navigation



*CG Coast guards

4.1 Vessel Traffic Service (VTS)

Vessel traffic service is provided by Loire Port Control on VHF channel 14.

Vessels must report to Loire Port Control before entering the fairway (SN1 buoy). Any defect must be reported.

Vessels will receive berthing or anchoring instructions.

Vessels must keep continuous watch VHF 14 during their call even after the completion of the mooring.

4.2 Access fairway

The fairway (from SN1/SN2 buoys to Donges Oil terminal) is 300 meters wide.

Inbound distances

From	To	Distance (nm)
SN1 Buoy	Pilot	14.6
Pilot	Saint-Nazaire Bridge	12.5
Pilot	Berth 1	14.2
Pilot	Berth 2	13.9

4.3 Anchorage area

A waiting anchorage area is located at the entrance of the mouth of the estuary (See chart INT 1840).

The waiting anchorage area is delimited by the following 4 points:

- 47° 08' 94 N – 002° 20' 28 W (WGS 84),
- 47° 08' 94 N – 002° 26' 70 W (WGS 84),
- 47° 08' 34 N – 002° 27' 98 W (WGS 84),
- 47° 05' 74 N – 002° 25' 78 W (WGS 84),

Depth : 19 to 30 meters

Bottom : Mud

4.4 Tide and Current

The water levels at tide gauges are broadcasted on VHF channel 23 every 10 minutes in French & English languages.

Annual Tide Tables of Nantes - Saint-Nazaire Port are published in legal time.

Data are also available on the Port website:

<http://www.nantes.port.fr/live-at-the-port/tide-times/?L=1>

Tidal range :

- Max spring tide: HW 6.30m / LW 0.30m
- Max neaps tide : HW 4.40m / LW 2.50m

Currents :

Terminal berths are exposed to currents generated by the astronomical tides and the river flow.

Average max currents are 2 to 4 knots. During spring tide periods and in conjunction with freshet in the river, ebb currents might reach 6 knots.

Ebb current is maximum 1.5 to 2 hours before low water until low tide.

Flood current is maximum at about half flood tide.

Main effect of current is a lateral “shore bank effect” – up to 250 t, pushing the vessel off the berth.

Expected current slack time and max. speed at berth :

Mean Neap Tide				
River flow :	Low tide	Flood current	High tide	Ebb current
	Slack time	Max. speed	Slack time	Max. speed
Low flow	LW+00h45	1.6 knot	HW+01h10	2 knots
Average flow	LW+00h30	1.6 knot	HW+01h20	2.4 knots
Fresh	LW	1.2 knot	HW+01h45	3 knots

Mean Spring Tide				
River flow :	Low tide	Flood current	High tide	Ebb current
	Slack time	Max. speed	Slack time	Max. speed
Low flow	LW+00h35	3.6 knots	HW+01h10	4 knots
Average flow	LW+00h40	3.4 knots	HW+01h30	4.4 knots
Fresh	LW	3 knots	HW+01h20	6 knots

Water density:

The admitted density of the river waters at Elengy Terminal averages 1.025 but may vary depending on tide effects and after river freshet or heavy rain. On some occasions, fresh water density can even be experienced.

4.5 Winds & weather forecasts

The prevailing winds of South to West and North-East have a limited sheer off action on the vessel berthed at Montoir LNG terminal. Weather forecasts can be obtained from Port Authorities at any time.

4.6 Depths

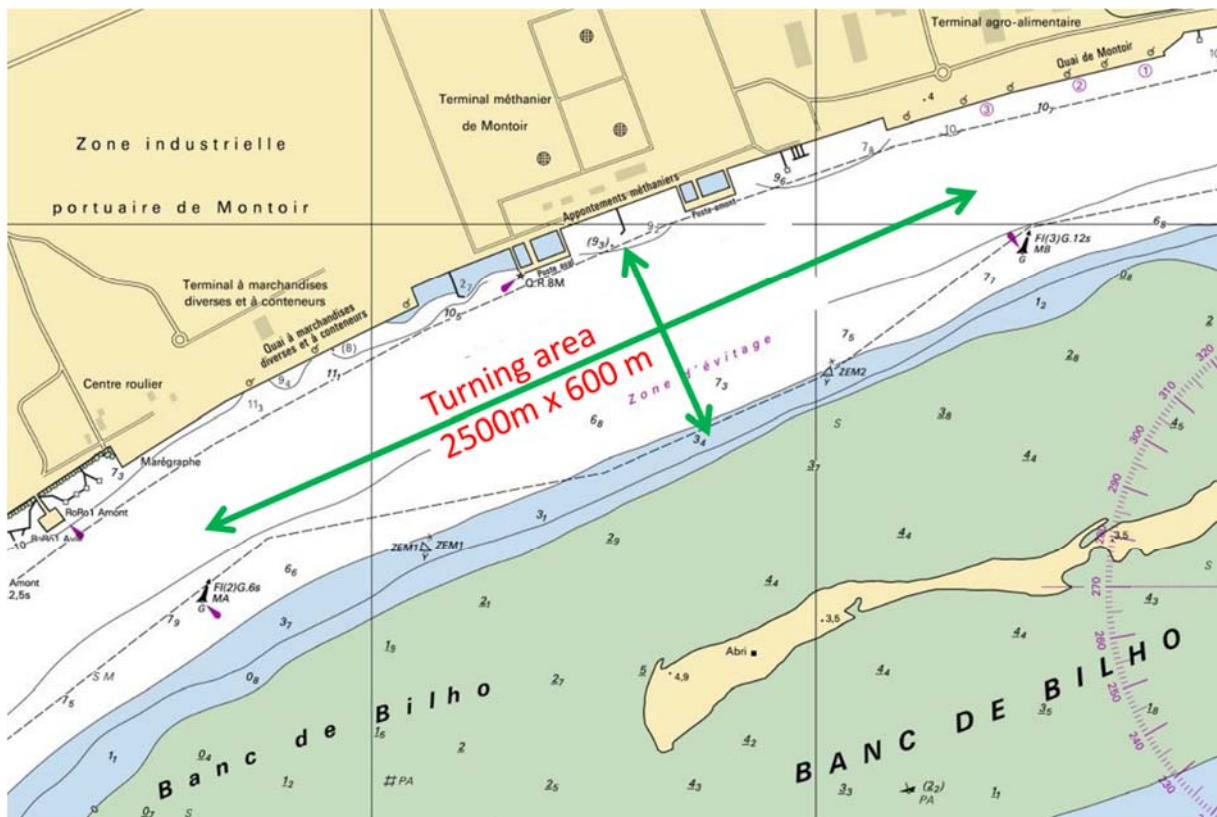
The water depth in the fairway and alongside berths are monitored by regular soundings and maintained by dredging when necessary. The bottom consists of mud.

The daily maximum draft in the fairway is calculated monthly depending on the dredged condition of the fairway and the tides.

Theoretical depths as mentioned on charts (m)	
Outer section of fairway	13.20
Inner section of fairway	12.40
Alongside berths	13.10

4.7 LNG vessels swinging area

Swinging area for LNG vessels is located in front of LNG berths.



4.8 Air draft and bridge of Saint-Nazaire

The maximum air draft for the LNG carriers calling at ELENKY Terminal depends on the height available under the bridge of Saint-Nazaire (61.40 m at chart Datum).

Max air draft = (61.40 m – tide level) , which includes 1,5 meter safety margin.

A vessel having an air draft below 55 m in normal ballast conditions is validated to cross the bridge in all conditions.

The maximum vessel air draft may be reduced by Port Authority for any specific safety reason (swell, tide surge, weather conditions...).

When aft radar mast needs to be lowered to pass under bridge, forward radar shall be operational. If no radars are available anymore, the vessel transit will be authorized by port authority only on good visibility condition. Port Authorities are to be advised prior to arrival via vessel agent.

4.9 LNG carriers transit

LNG carriers have to be at Pilot boat station at least 3 hours before high tide (see chart INT 1840).

When passing SN1 buoy, contact «Loire Port Control» on VHF channel 14 and then «Loire Pilots» on channel 12 to confirm pilots boarding time.

Estimated Time of Berthing (ETB), i.e. first line ashore, is anticipated to be during high tide condition at slack water, approximately 2 hours after POB. Therefore, pilots will usually board the vessel around 2.5 to 3 hours before high tide. Timings may vary depending on port traffic and weather/tides conditions.

Manoeuvring is allowed during day and night.

If two vessels are scheduled at the same tide (e.g. for transshipment operations), berthing sequence is instructed by Port Authorities and Pilots in coordination with ELENGY. The commonly applied rule of first arrived/first berthed is not applicable.

Navigational safety distances and traffic regulation :

- Traffic in the fairway and in the river is regulated by Port Authority (Loire Port) and Pilots.
- **Exclusion zone** for standard LNG carriers navigating in the fairway is 2 nautical miles ahead and astern. For ARC7 class LNG vessels with Azipods (“Yamalmax”), exclusion zone ahead might be reduced down to 1 nm, due to their manoeuvring capacities.
- **Reverse traffic** for large vessels is prohibited when LNG carrier is engaged in the fairway.
- **IMO COLREG** (collision regulation) convention rules are in force in the fairway.
- Traffic is restricted in the **safety zone of 50 meters** around a moored LNG/C.

Wind restrictions	
Access to the fairway	25 knots (*)
Under-keel clearance	
Inner channel	10% of the max. draft
Turning circle	2 m
Alongside berth	2 feet

(*) It is prohibited for an LNG carrier to proceed in the fairway with winds over 25 knots, and when the visibility is less than 300 m. Nevertheless, when vessel manoeuvrability has been tested, she could proceed in the fairway with winds up to 30 knots, depending on direction and predictions. The decision to proceed will be taken in accordance with Harbour Master, Pilots and ship’s Master.

Limitations for Q-max vessels: Wind speed in fairway reduced to 20 knots and the berthing is portside alongside.

Arrival/Departure at low tides :

Arrival and departure at low tides are possible under specific conditions related to tide coefficient and vessel draft. Authorisation is to be granted by Port Authority and Pilots.

4.10 Pilotage

Pilotage service is normally provided by two pilots for LNG carriers.

Pilots board by boat launched from the pilot boat “La Couronnée” at the Pilot boarding point **47°07.4'N-002°21.1'W**, which is 4 nm West of Pointe Saint-Gildas.

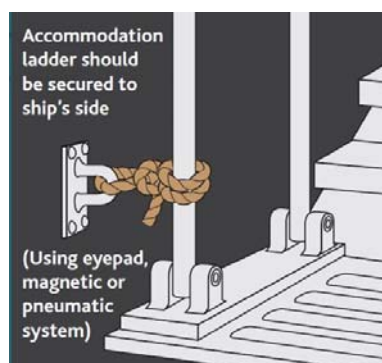
Standby position of the Pilot Boat is in the West of lateral buoy “La Couronnée” (47°07.6'N-002°20.1'W - Fl(2)G.6s Racon). Pilot boat “La Couronnée” keeps a continuous watch on VHF channel 12.



On some occasion, pilots may board by using transfer high speed launch :

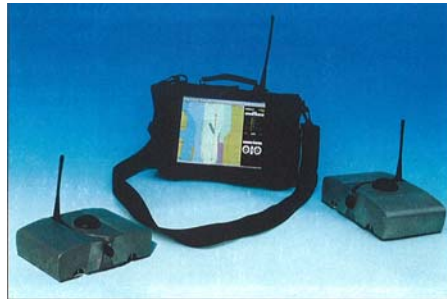


Gangway arrangement : When pilot ladder is used combined with accommodation ladder, it must be properly secured to the vessel side (i.e. on lug pads) to ensure pilot safe boarding and disembarking operations when the vessel is rolling. Also prepare a heaving line to hoist PPU.



PPU:

A Portable Pilot Unit (PPU), called **GPS Port**, is used by pilots for LNG carriers as a navigating and berthing aid. PPU is operated by the pilots on board the vessel during fairway transit, swinging and berthing.



4.11 Tugs

In normal condition, Pilots advice ship Masters on the number of tugs necessary for the good realization and for the safety of the considered manoeuvre.

For safety reason during transit or when vessel is alongside, the Port authority can require an additional tug (vessel moving alongside, lack of mooring watch keeping...).

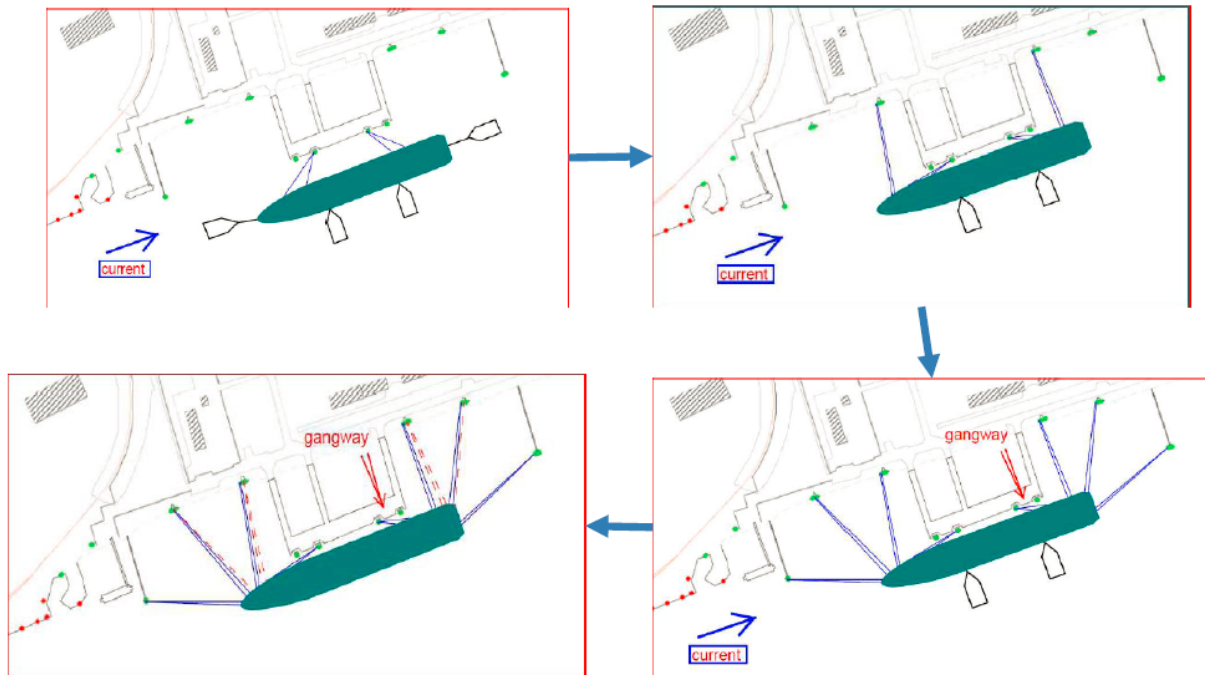
		Number of tugs required	
Vessels type	Berthing side	Arrival	Departure
LNG up to 300 m LOA	Starboard	4	2
	Portside	4	4
Q-Flex	Starboard	5	2 (3 if south wind>20 kn)
	Portside	4	4
Q-Max	Portside	4	4
Yamal class	Starboard	3	2
	Portside	3	3

Arrival: 3 to 5 tugs (ASD or tractor tugs) - Bollard pull from 40 tons to 70 tons.

Standard case is 2 tugs made fast fore and aft on center fairlead with tug line + 2 tugs pushing.

(Q-Flex : one more tug forward) (Yamalmax : one tug less on the aft station)

1. Swinging and berthing of LNGC with 4 tugs
2. Release 2 tugs once 2 springs/2 breast fast forward and aft.
3. Release 2 last tugs once all ship's lines all fast.
4. Complete mooring with shore lines.
5. After bonding cable is connected, and the shore gangway in position, the pilots and linesmen disembark on shore side.



Important notes :

- In normal conditions, once 4 springs and 4 breast lines are made fast, **only two tugs** are necessary for the “pushing” phase while sending lines ashore.
- All tugs can be released once ship’s lines are secured. No tug assistance is needed to make fast or release **shore lines**.

Departure: (near slack tide)

- Pilots and linesmen board the vessel, using the shore gangway.
- Starboard side alongside: 2 tugs made fast fore and aft: tug line, center lead.
- Portside alongside: 2 tugs made fast fore and aft: tug line, center lead + 2 tugs pushing.
- No tugs are needed to cast-off shore lines, while all other ship’s lines are still secured.

Stand by tug:

One tug remains manned and stand-by on VHF 14 during cargo operations for any emergency use.

4.12 Mooring lines handlers (boatmen)

Boatmen services are ordered by vessel agent.

Boatmen board LNG carriers in order to assist and advise crew members for **shore lines** handling on deck. On arrival, they normally board the vessel by boat just prior to berthing, using the pilot combination ladder. Pilots will advise boarding procedure to the Master. On departure, they board and leave the vessel via shore gangway.

5. Berthing and mooring

5.1 Berths overview

The Terminal has 2 berths:

- **Berth 1**, also named GDF1 is the upstream berth (Donges side)
- **Berth 2**, also named GDF2 is the downstream berth (Saint-Nazaire Side)

Both berths are equipped for the reception of LNG carriers from 220 meters LOA (Medmax) up to Q-Max vessels.

Terminal decides berth allocation depending on operational circumstances.



	Berth 1	Berth 2
Position (WGS84)	47°18.0'N-002°08.2'W	47°17.9'N-002°08.6'W
Water depth alongside(m)	13.10	
LOA max. (m) – Length overall	345 (Q-max)	
LOA min. (m)	220	
Beam max. (m)	No restriction	
Draft max. (m)	12 (*)	
Height under Saint-Nazaire Bridge (m)	61.40	
Air draft max. (m)	61.40 – tide level	
Displacement max. (T)	177 000 (*)	
Heading alongside	252.5°	249.5°
Approach/berthing speed	< 15 cm/s	
Quick release hooks SWL	150 T	

(*) Terminal may be capable to receive LNG carriers of bigger size after specific compatibility study.

Mooring and fendering arrangements

Drawings and equipment characteristics are provided in **appendix 1**.

All mooring hooks are equipped with remote release option. Only the approval of the Terminal after discussion with the port authorities can validate the remote opening. A simultaneous opening is not possible. Mooring hooks would be released one-by-one, in coordination with Master and Pilot.

5.2 Berthing aid system

Both jetties are equipped with a Berthing aid system which can be used by the Pilot and all operators involved in berthing operation.

They inform in real time the pilot about speed and direction of the stern and the bow of the vessel by means of two “Large Visual Display” screen (LVD). Speed and distance are indicated on those two installed on the shore and visible from the bridge of the vessel.

Sets of three lamps (one stern and one bow) are installed on the display frame for speed indication. They quickly inform the vessel on the parameters of the berthing operations.

Green	Safe speed	0 to 10 cm/s
Amber	Cautionary speed	10 to 15 cm/s
Red	Dangerous speed	Above 15 cm/s

Berthing Aid System automatically starts when the vessel is close to the berth and detected like such by the AIS system.



5.3 Mooring Load Monitoring System (MLMS)

On each mooring hook, sensors are positioned to measure tension exerted by the vessel on each mooring line. The aim of this system is to provide continuous monitoring of mooring line loads.

Interface screens in the Terminal control room provide real time monitoring of mooring lines tensions. Vessel staff can contact Terminal at any time to get information about tension.

5.4 Shore lines

In addition to ship's lines, terminal provides shore lines to cope with required mooring patterns. Their role is mostly to prevent vessels from moving around low tide hours, when current is maximum.

Shore lines are secured on vessel's bollards after ship's lines, with assistance and under supervision of port linesmen coming on-board (§4.12). Reverse procedure applies on departure to cast off the shore lines.

Tugs assistance is not required during shore lines securing and casting-off phases.

Shore lines are composed of two parts: the main line and its tail:

	Main line	Tail
Type	Ultraline HMPE (Dyneema) SK78	Compo 110 – 11 meters length
Material	High Modulus Polyethylene	High Tenacity Polyester
Core	8 strands	8 strands
Diameter	44 mm	88 mm
MBL	143 T	148 T
Weight	108 kg/ 100 m	380 kg/ 100 m
Elongation	Linear: 2% (80 T)	Non-linear: 5% (20 T), 10% (50 T), 15% (100 T)



5.5 Mooring plans

Side alongside :

Vessels are usually berthed starboard side alongside, except :

- Q-Max vessels,
- In some transhipments configurations involving two vessels arriving simultaneously,
- In exceptional circumstances, with Port authority and Pilots approval.

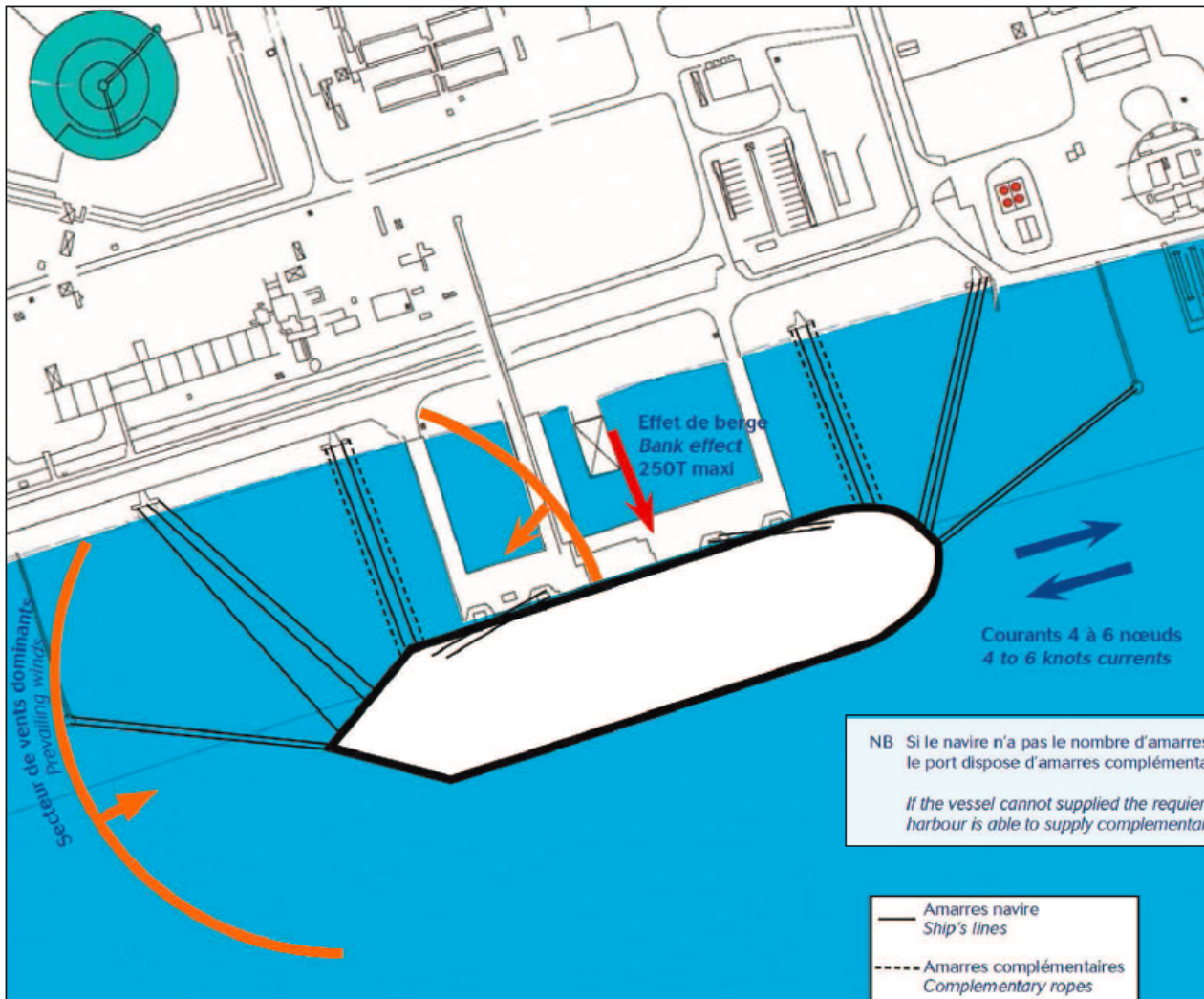
Mooring pattern approval:

Mooring pattern is established during vessel approval process with Terminal and approved by Port Authorities. Vessel operator shall provide to the Terminal and Port Authority a mooring calculation showing wind speed limits with required below mooring pattern, taking into account a perpendicular bank effect of 250 tons and 6 knots ebb parallel current.

The mooring pattern must be transmitted to the vessel master before arrival. At the end of mooring, Port Authority will check mooring pattern and, for the first call, will sign the agreed mooring pattern with the Master.

Same mooring pattern will be used for berth 1 and berth 2. The mooring pattern will always be the same at Montoir for a particular vessel and will be attached to the Ship Shore Safety Plan.

Mooring pattern modifications can be done at request and must be approved by Master and Port Authorities.

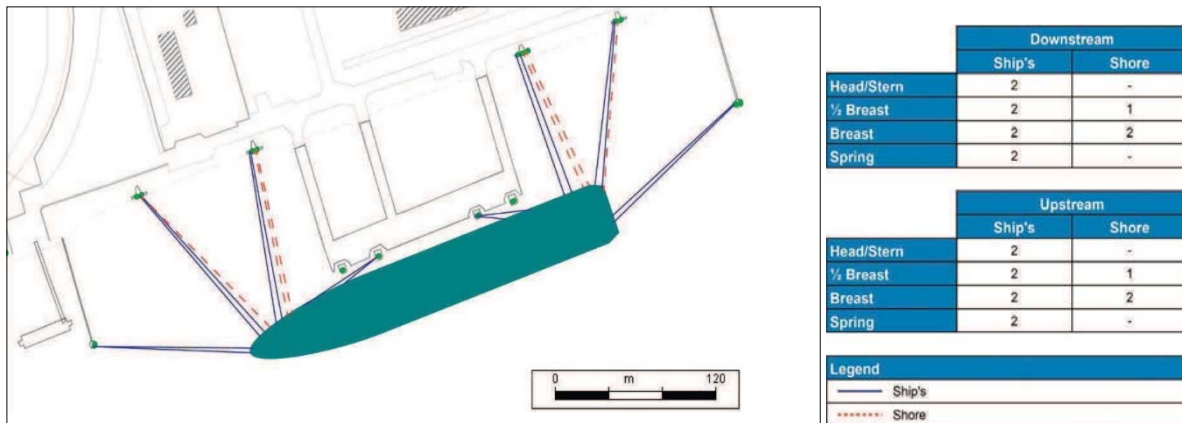


The mooring plan **must be** :

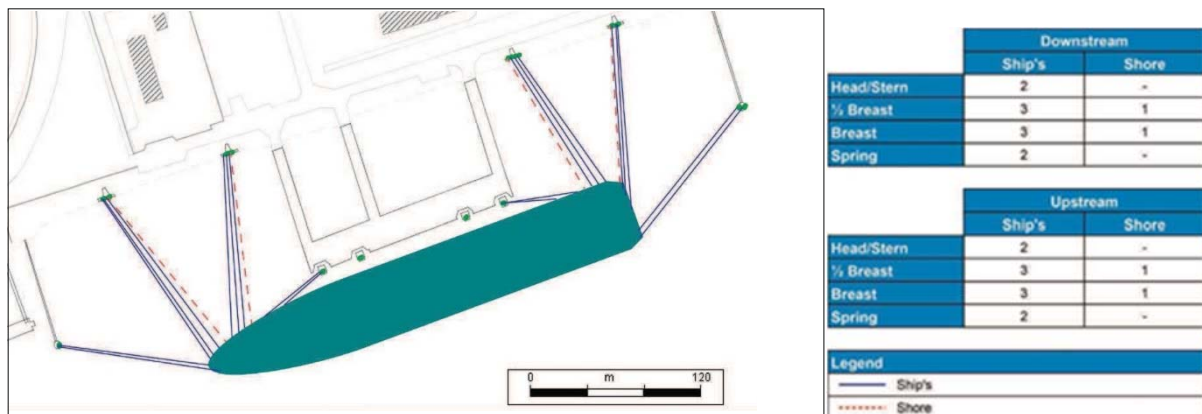
- For vessels up to 300 m LOA : 22 lines (2 head/3 semi breast/4 breast/2 spring)
- For Q-Flex : 24 lines (2/4/4/2)
- For Q-Max : 26 lines (3/4/4/2)

Ship's lines are used as much as possible. Shore lines are used to complete mooring pattern in order to reach the required quantity of mooring lines.

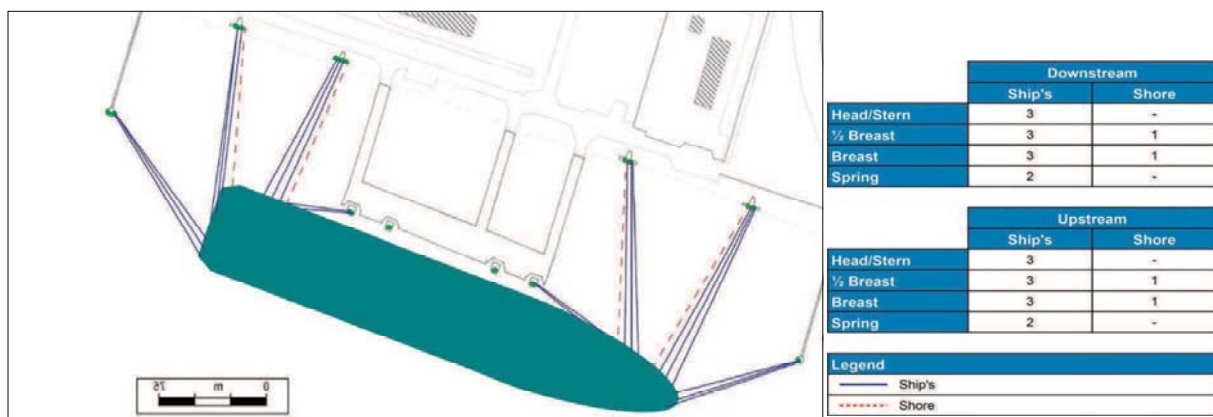
Typical mooring plan for vessels up to LOA=300 m



Typical mooring plan for Q-Flex type LNGC (LOA=315 m)



Typical mooring plan for Q-Max type LNGC (LOA=345 m)



5.6 Mooring instructions to Masters

It is the vessel Master responsibility to ensure that his vessel remains securely moored at all times.

Vessel Master is responsible for the following mooring instructions :

- An efficient and permanent watch must be maintained on deck throughout the call.
- All ship's ropes and wires leading in the same direction shall be made of the same material and must be in good condition.
- Mooring lines shouldn't be slacked if the vessel is not firmly in contact with the fenders even if they are tight.
- Shore mooring lines are set up on arrival with port linesmen and must not be adjusted by vessel crew during the call without Port advice and linesmen assistance.
- **“Loire Port Control” must be informed before any mooring adjustment on VHF channel 14 (port authority authorization).**
- Cargo transfer operation shall be stopped immediately in case of mooring failure or excessive vessel movement.

6. Access to berths and vessels – visitors policy

6.1 Access to berths

Access to berths is available via dedicated gate located West of the terminal, and called “Porte Ouest” (West gate). This access prevents from passing in Terminal gas processing areas.

An accredited security guard is on duty onshore at the Terminal gate at all times during the call.

The ways to be followed from the main road roundabout to the West Gate and from the West Gate to the Vessel on the berths are materialized below :



6.2 Access to vessels & shore gangways arrangements

Both berths are equipped with a fixed gangway tower and a mobile gangway. Fixed gangway will be the privileged access mean and mobile gangway is used as a backup if fixed gangway cannot be fitted.

Berth 1 fixed gangway tower :

Landing area: 26 to 32 m eastward from vapour line.

Height working range: 12 to 26 m from CD.

Gangway + deck ladder weight : 3440 kg

Max. wind to move on/off the ladder : 72 km/h (39 knots – Beaufort 8)

Berth 2 fixed gangway tower :

Landing area: 27m eastward from vapour line, +/- 2 m.

Height working range: 9 to 27 m from CD.

Details of the gangway towers in **appendices 2 and 3**.

Mobile gangways :

Same arrangement for berth 1 and berth 2.

Length: 22 m

Breadth: 1.04 m

Footprint of the deck ladder: 1.10 m

SWL: 5 940 kg

Landing zones are available at following locations from the vapour arm :

- 61 to 66 m Eastward
- 41 to 46 m Eastward
- 61 to 66 m Westward
- 41 to 46 m Westward

Mobile gangway will preferably be positioned aft of the manifolds.

Procedure and instructions to vessels :

As soon as ship's lines are all made fast, the vessel must be ready to receive the terminal gangway. Terminal staff operates the access tower, the gangway and land it in the pre-designated area. A non-slip surface must be provided by the vessel at the base of the gangway. During the installation and removal of the gangway, a vessel crewmember must be present in order to monitor and coordinate the operation in relation with terminal staff.

Access is permitted only when the gangway is safe and secured. If a safe access is not available between the shore and the vessel, all cargo, bunkering, ballasting operations will be stopped until the normal situation is restored.

A vessel crewmember must stay on the vessel deck near the gangway at all time during the call in order to control the access to the vessel and watch for any abnormal condition. Vessel must call Terminal in case of abnormal gangway movement. The gangway position is adjusted if needed by a terminal operator.

On departure, the Pilot calls the Terminal Control room in order to remove the gangway, once all shore staff, including port linesmen, have left the vessel.

Note : It is authorized to make fast and release **shore lines** with shore gangway landed on deck in order to allow port linesmen to board the vessel and assist crewmembers.

6.3 Visitors policy

Crew members who are not on duty are considered as visitors.

Visitors' list must be sent to the terminal before vessel arrival.

Access to terminal's berths and vessels alongside is allowed to Elengy terminal badge holders and to people listed on the visitors' list after badge delivery. Otherwise, visitors must wait for Master and Terminal common permission before access is granted.

Any person authorized to board a vessel or to access to the Terminal's berths must verify and wear the requested personal protective equipment (PPE). Those PPE are, at least: **covering clothes and closed shoes.**

Vessel access is authorized only after ship's lines mooring is completed.

Safety & security rules (prohibition of smoking, of phoning, of taking pictures...) are shown on the vessel dedicated gateway and must be strictly followed.

7. Safety requirements

7.1 Vessel safety requirements

Following safety arrangements are required by the terminal :

- ✓ Fire pumps ready for an immediate use. The fire main line must be pressurised during all the stay at berth.
- ✓ 4 to 6 fire hoses and nozzles rigged to their fire hydrant and unrolled on the main deck.
- ✓ Portable powder extinguishers positioned near the vessel's manifolds.
- ✓ International Fire connection available which location is clearly identified and ready to be connected on the Terminal fire system. The connecting point shall be agreed between Vessel and Shore.
- ✓ Seaside lifeboat ready for emergency escape or abandon.
- ✓ Pilot ladder or an accommodation ladder rigged or positioned on seaside and ready to be lowered immediately to serve as an emergency escape way.
- ✓ Emergency towing-off pennants (fire wires) on seaside forward and aft, the eye of the towing line being maintained 1 m above the water and 50 m of slack on deck.
- ✓ A permanent watch is required on vessel deck close to the manifold during any cargo transfer operation.
- ✓ Cargo tanks overfill protection system, as required by IGC code, shall always be in service during cargo transfer operation, including during unloading operations. System shall be tested prior to arrival.
- ✓ Water curtain must be running before arm connection and during all transfer of LNG. It can be stopped after arm disconnection.
- ✓ At any time and under short notice, the vessel must be able to leave the berth by its own means. Low-Load Gas Mode is allowed during transfer.
- ✓ Any deficiency on-board, especially related to safety, navigational, propulsion, mooring and cargo equipment, shall be reported to the terminal.

In addition to above requirements, vessel shall adhere with industry standards & requirements as defined by OCIMF and SIGTTO (unless specifically advised by the Terminal).

7.2 Vessel maintenance and repairs alongside

Any undertaken repair alongside is subject to a written permission of the Harbour Master's Office and LNG Terminal. Fixed-point test of engines, test of life saving appliances (lifeboat drill, rescue boat drill), fire alarm, other safety devices, or the vessel's horn, should not be carried out without the permission of the Harbour Master's Office.

Engines and boilers exhaust pipes sweeping is absolutely forbidden in Harbour as to emit foul and thick smoke.

7.3 Ship shore bonding cable

Bonding cable is provided by terminal and to be connected immediately on arrival on Berth 1 and 2.

7.4 Terminal Fire-fighting equipment

The firefighting water system at the Terminal is permanently maintained with fresh water at a pressure of 11 bar. In the event of a fire, the system is fed with sea water. In the event of frost, when the outside temperature drops below -2°C, the fire system is drained. In this case, it takes approximately 2 minutes to make the system available.

The Vessel can be connected to the Terminal's system using the international connexion located on each berth, on the transfer platform at the bottom of the arms. The water flowrate is 60 m³/h.

Some tugboats are fitted with firefighting equipment. These can be connected to the Terminal's firefighting system at the transfer platform on each berth. The water flowrate is 1000 m³/h.

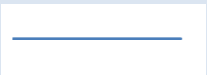

Each berth is equipped with a 1 500kg powder fire extinguisher and two dirigible monitors (500 kg/min effective up to a distance of 25 m).

8. Emergency management

8.1 Emergency signals

In the event of an accident onshore at the Terminal

The Terminal will launch the appropriate emergency plan according to the type of incident. Any persons on the quay on shore between the West gate and the Vessel must go to the most easily accessible assembly point: either the West gate or the Vessel.

<p><u>VESSEL ACTIONS</u> upon sounding of a siren with <u>continuous tone</u> at the Terminal</p> 	<ol style="list-style-type: none"> 1. <i>Assemble and count the personnel inside the Vessel</i> 2. <i>Await the instructions of the Terminal</i>
<p><u>VESSEL ACTIONS</u> upon sounding of a siren with <u>modulated tone</u> at the Terminal</p> 	<ol style="list-style-type: none"> 1. <i>Confine and count the personnel inside the Vessel</i> 2. <i>Close off the ventilation systems from the exterior</i> 3. Await the instructions of the Terminal & Port Authorities (VHF 14 and AIS) 4. Stand by engines

In the event of an accident on-board the Vessel:

<p><u>VESSEL ACTIONS</u> in the event of an incident/accident on the Vessel (illness, leak, fire, etc.)</p>	<ol style="list-style-type: none"> 1. Immediately alert the Port and Terminal which will implement the appropriate shore safety mechanisms and directly call the external emergency services if necessary. Depending on the significance of the accident: 2. Emergency shutdown of cargo transfer with closure of valves on-board and onshore and drainage of the berth's LNG lines. 3. On joint decision of the Vessel's officer and the Terminal's representative: emergency disconnection of the arms. 4. Only on Port's order: emergency departure of the Vessel.
--	---

8.2 Emergency services

In case of incident on board :

1. Inform first Port Authority and then Terminal who will mobilize the appropriate emergency service.
2. If no response, call 112 via an external phone line or via a mobile phone (provided by Agent).

8.3 Management of emergencies

In case of significant incident, Terminal will set up emergency crisis team and follow emergency procedures. Operations will be directed by the on-duty manager, called the **Director of Internal Operations** (DOI).

Vessel will be advised of required actions, either by the DOI or the shift supervisor (Loading master) or the control room panel operator.

8.4 Emergency departure

Vessels might be required to leave berth if an emergency occurs in the Terminal or within the port area, according that un-berthing can be done safely.

Such a decision will be taken in coordination between the Master, Port Authorities and the Terminal duty manager (DOI).

9. Cargo operations

9.1 Ship/Shore communications

Once alongside, Elengy gives a **walkie talkie** to the vessel in order to maintain communication during the commercial operations.

The vessel's agent must provide a **mobile phone** to the Vessel: this mobile phone must stay at all time in the CCR during the call.

Two types of **ship-shore link** connections are available at LNG berths :

- Electrical connection (ESD & Telephone line) via PYLE plug
- Pneumatic connection (ESD)

1. Pyle National Compatible Electric System :

The system is made by a multi-wire electric cable and Pyle multi-pin connector 37 pins.
The Pyle cable is provided by the Terminal.

Pyle plug configuration	
Hotline	1, 2
Dial line from/to Terminal	5, 6
Shore tel line 1	7, 8
Shore tel line 2	9, 10
Ship ESD	15, 16
Continuity loop test	17, 18
High level shore tanks	21, 22
Terminal ESD	23, 24
ESD1 (transfer stop + close valves)	25, 26
ESD2 (Arm disconnection)	27, 28

This link provides both phone and ESD capabilities. This link is set immediately after the gangway is landed and deemed a safe access to the LNGC. **Ship staff will connect the shore cable given by Terminal operator at the berth.** It will remain operative until the gangway is about to be removed for un-berthing. The vessel must ensure that the on-board ESD connection is in good condition and clear of any obstructions.

2. Pneumatic ESD link :

Pneumatic link is normally not connected but can be used when electric PYLE system is not working properly.

9.2 Pre transfer meeting

1. Test of communication channels and agreement on communication procedures.
2. Port ship-shore safety check list : Main purpose is to exchange actual status and safety information between vessel and Terminal.
3. Operation plan and schedule : Main purpose is to exchange on the way that operations will be conducted by vessel(s) and Terminal, including ramp-up, loading rates, ramp-down, BOG management, etc... Agreed schedule is informative only and subject to change during the call.
4. Terminal handbook : Vessel confirms receipt of terminal handbook and implementation of all instructions.
5. Notice Of Readiness (NOR) can only be signed after the completion of ESD tests and after effective connection of the arms, not at the end of Pre-transfer meeting.

Note 1 : Last version of terminal handbook and operation plan must be printed and available in vessel cargo control room.

Note 2 : For transshipment operations, pre-transfer meeting is held separately on both vessels by terminal staff. Vessels are in contact via walky-talky or telephone.

9.3 LNG Custody transfer

CTMS is carried out as per Contract providing access to the Terminal.

Before the arms are connected, Terminal's Loading master or his representative will board the LNGC accompanied by a representative of Terminal's customer for Custody Transfer, mostly a cargo surveyor.

Cargo Surveyor is not allowed in the Terminal at any time unless specifically agreed prior to the call.

The quantity that will be transferred will be based for Custody Transfer on the LNGC tanks gauging. To verify the composition of LNG during cargo transfer, an on-line chromatograph is installed at each berth.

Gas burning is allowed alongside and shall be taken into account when calculating the net transferred quantity in agreement with the terms of the Contract providing access to the Terminal.

Mercury and Sulphur analysis available.

9.4 LNG transfer arms

Refer to **appendices 4 and 5** for loading arms drawing arrangements.

Arms characteristics	
Cargo arms – Technip FMC	3 liquid and 1 vapour
Cargo arms size	16"
Max. LNG flowrate / arm	4 650 m ³ /h
Design pressure (LNG)	12 barg
Max. NG flowrate	15 000 Nm ³ /h
Design pressure (NG)	3 barg
QCDC (Quick connect disconnect couplers)	16" hydraulic
PERC (Powered Emergency release Coupler)	Yes
Nominal unloading rate	14 000 m ³ /h
Nominal loading rate	4 000 to 5 000 m ³ /h
Nominal transshipment rate	14 000 m ³ /h

Ship's flange position requirement	Max.	Min.
From ship side	5.50 m	2.50 m
Height above CD	32.00 m	16.40 m
Ship flange spacing	4.00 m	1.82 m

Flange type requirement	
<p>ANSI B16.5 150 lbs - 16"</p> <p>Flat face or raised face.</p> <p>Thickness: 36.6 to 39.8 mm</p> <p>Min. space required for QCDC connection beyond flange (ship side): 180 mm.</p> <p>Outside diameter (OD) : 593.8 to 600.2 mm B diameter : 469.9 mm +/- 0.5mm C diameter : 429.0 mm +/- 0.5mm</p> <p>Surface finish:</p> <p>S1 : 0.4 µm for primary seal from "ID" to "C" dia. Shore side : Primary seal – Packing type.</p> <p>S2 : 3.2 µm to 6.3 µm for secondary seal from "C" dia. to "B". dia. Shore side: Secondary seal – O type (dia. 444,7 mm)</p> <p>(Ref. FMC Technologies – Chiksan III)</p>	

Support jacks

A mechanical jack is fitted on the style 80 to alleviate a part of the load applies to the flanges, Terminal can ask to adjust the jacks once the arms cold and before the beginning of transfer.

Filters

Terminal requires ASTM 60 mesh type filters.

Vessel positioning :

The Spotting Line is the position at which an LNG carrier should be held by the mooring lines so that the vapour returns on board and ashore are exactly in line with one another.

Spotting line is indicated by a “O” on each berth:



Max. allowed ship's movement (arms envelop)	
Increased vigilance from terminal and vessel	> 1 m
Suspension of cargo transfer	> 1.5 m
ESD 1 - Surge (forward and aft)	+/- 2.5 m
ESD 1 - Sway (moving off the berth)	3.5 m
ESD 2 – Any directions	0.6 m after ESD1

Weather limits		
	Berth 1	Berth 2
Suspension of cargo transfer	35 kn - 65 km/h*	
Disconnect arms	Only if weather forecast deteriorating towards below limits	
Max. wind for loading arms in operation	43.5 kn – 80 km/h*	49.5 kn – 92 km/h*

*Average wind speed based on 10 minutes

Operational procedures and instructions :

One Terminal operator plus a Loading master (or his representative) will be present for berthing, connection, cool down and disconnection of the LNGC.

Tightness tests are performed using nitrogen gas at a pressure of 6 bar or above according to expected back-pressure.

At the end of transfer, the transfer arms are drained by the Terminal's operators by gravity and by introduction of nitrogen. The LNG on the sea side is pushed towards the ship.

The flanges can be warmed by heat exchange with the ambient air or by the ship spraying the connecting parts with water for at least 30 min before disconnection. In standard conditions, the minimum time required to warm the arms is around 2 hours after draining and purge. In case of transshipment, disconnection can occur right after draining and purge, i.e in cold condition.

The terminal gas return valve remains open until arms disconnection.

Disconnection time shall be agreed during the pre-transfer meeting. Loading arms will be disconnected at least 1 hour before departure.

9.5 LNG transfer emergency shut down : ESD1 & ESD2

ESD 1 – Unloading (« Arrêt d’Urgence Déchargement »)

Ship action	Shore Action
Send/Receive ESD Signal to/from shore ↔	Send/Receive ESD Signal to/from ship
Close manifold valves in 25/30s	Close shore ESD valves in 30 s (Liquid only)
Trip ship’s cargo pumps	

ESD 1 - Loading (plus Cooling down or gassing up) (“Arrêt d’urgence Chargement”)

Ship action	Shore Action
Send/Receive ESD Signal to/from terminal ↔	Send/Receive ESD Signal to/from ship
Close manifold valves in 25/30s	Close shore ESD valves in 30 s (Liquid only)
	Trip Terminal pumps

ESD 1 – Transhipment (“Arrêt d’urgence transbordement”)

Unloading Ship Action	Terminal Action	Receiving ship Action
Send/Receive ESD Signal ↔	Send/Receive ESD Signal ↔	Send/Receive ESD Signal
Close manifold valves in 25/30s	Close shore ESD valves in 30 s (Liquid Only)	Close manifold valves in 25/30s
Trip unloading ship pumps		

ESD1 can be initiated automatically or manually from Cargo Control Room, Berth platform, Terminal Control Room.

Tests prior cargo transfer :

Terminal requires ESD tests before unloading or loading as per SIGTTO guidelines.

Warm tests (required by Terminal) consist of ESD link communication test and associated effects verification by triggering one ESD activation from each involved party, i.e. terminal and vessel(s).

Cold ESD tests are performed on vessel request only.

ESD 2

ESD 2 is the automatic emergency disconnection of loading arms, preceded by an ESD 1 sequence.

ESD is triggered either manually by the terminal or automatically if vessel drifts over to the loading arms ESD 2 envelop limits.

9.6 Unloading operations

Arrival requirements :

- Actual cargo tanks vapour pressure shall not exceed 140 mbarg.

Liquid transfer:

- The Terminal drives the progress of unloading operations.
- LNG can be discharged in the 3 shore tanks, each of 120 000 m³ gross capacity, with a maximum flowrate of 14,000 m³/h.

Gas return:

- Boil off gas (BOG) normal operating pressure of the Terminal is 1 190 mbar. Terminal operates return gas in free-flow. Vessel picks up what is necessary to compensate discharge.

9.7 Reloading operations

Arrival requirements :

- Vessel shall arrive with cargo tanks in cold condition (<-130°C average for membrane tanks and <-115°C for MOSS tanks). If not, terminal will request for a cool down.
- Actual cargo tanks vapour pressure shall not exceed 140 mbarg to avoid abnormal differential pressure with Terminal.
- Before reloading operations, Terminal maintains shore tank pressure around 1130 mbar for 4 to 5 days, equilibrium pressure of LNG is then approx. 130-140 mbarg.

Liquid transfer:

- Terminal ensures that the quality of reloaded LNG is homogeneous (no density change).
- The Vessel drives the progress of reloading operations (ramp-up, max rate, ramp down).
- Maximum reloading flow rate is 4 000 to 5 000 m³/h, with 8 pumps at max flowrate.

Gas return :

- Terminal tanks are kept around 1 130 to 1 150 mbar during reloading operation.
- Vessel is requested to maintain pressure at 1 160 mbar or as high as possible in her tanks in order to limit boil off generation and vapour return to shore.
- Vessel may return gas either on free-flow or use **one HD compressor only**, with prior approval from Terminal. **Terminal will instruct vessel about maximum gas return flow allowed back to shore.**
- Terminal BOG recovering capacity from the vessel depends on terminal operational conditions. Exceeding return gas is flared.
- **Gas return with HD compressor to shore after CTMS is not allowed** unless for safety reason.

9.8 Transhipment operations

Transhipment operations are performed between two vessels simultaneously berthed at Montoir LNG terminal. Both vessels normally manoeuvre at the same high tide to come alongside and to depart, as instructed by Port authorities and Pilots. Berthing and un-berthing sequences are confirmed by Port authorities and Pilots on arrival.

LNG is transferred directly from delivering vessel to receiving vessel, via Terminal pipings (ID 32").

Arrival requirements :

- Receiving vessel shall arrive with cargo tanks in cold condition (i.e. -130°C average for membrane tanks and -115°C for MOSS tanks). If not, terminal will request for a cool down.
- Actual cargo tanks vapour pressure shall not exceed 140 mbarg to avoid abnormal differential pressure with Terminal.
- Before starting transfer operations, vessels must have their deck lines cold if possible.

Liquid Transfer:

- Prior to any transfer, hard arms and transfer lines should be cooled down as per operation plan. Transfer can start once both berths arms and lines are cold.
- Terminal coordinates cooldown phases together with vessels. Receiving vessel drives ramp up phase under Terminal supervision. Maximum transfer rate is 14 000 m³/h.

Gas Return:

- Boil off gas generated by the transhipment is returned by receiving vessel to shore, then recovered both by discharging vessel (just as needed to maintain pressure in her tanks), and by terminal compressors (which is sent into the grid).
- Terminal will keep shore tanks pressure between 130 and 160 mbarg.
- Receiving vessel shall maintain tanks pressure as high as possible to limit boil off gas generation and vapour return to shore.
- Receiving Vessel shall return gas with **one HD compressor only**, with prior approval from Terminal. **Terminal will instruct vessel about maximum gas return flow allowed back to shore.**
- Terminal BOG recovering capacity from the vessel depends on terminal operational conditions. Exceeding return gas is flared.
- **Gas return with HD compressor to shore after CTMS is not allowed** unless for safety reason.

9.9 Management of evaporations (BOG)

The Terminal and/or the Vessel operating conditions (in particular the thermodynamic conditions of the liquid and vapour phases in the Vessel's tanks) may make the reincorporation of evaporations (boil off gas – BOG) momentarily impossible. In this case, the Terminal may request to decrease the cargo transfer rate. **If the vessel refuses to decrease the transfer rate, the evaporations not reincorporated will be flared; the amount of gas flared will be allocated to the Shipper. However, for safety reasons, the Terminal can oblige a decrease of the transfer rate to the vessel.**

Gas burning to engines or GCU is normally allowed while alongside.

9.10 Gassing-up operations

The vessel tanks have to be under inerted atmosphere on arrival. Inerting is considered complete when less than 5% O₂ (vol.) and dew point below -40°C are detected in the vessel's tanks. Inerting is controlled for each tank on arrival with Terminal representative.

Gassing up phase 1 : Gas is vented at vessel mast. Phase is completed when 5% CH₄ content is detected at vessel's vent mast. Content to be controlled with Terminal representative.

Gassing up phase 2: Gas is vented through terminal flare. Phase is completed when CH₄ content > 99% and CO₂ content < 1% in vessel's tanks. Terminal will use a dedicated gassing-up flare. Max design capacity of gassing-up flare 20 000 m³/h (at 0°C / Atm P).

9.11 Cooling Down operations

Tanks should contain less than 0.02% CO₂ (i.e. 200 ppm) before cooling down. If not, tanks should be gassed-up prior cooling down.

The Vessel drives the progress of cooling down. The Terminal is under orders of the vessel to provide appropriate LNG pressure at the flange of the vessel.

Vessel returns gas to the terminal.

9.12 Cargo Transfer interruption

Both Terminal and Vessel can ask for adjustments or interruptions in cargo transfer. This can occur for various reasons, such as but not limited to :

- Maximum transfer rate in terminal lines
- Approaching maximum storage tank levels
- Approaching minimum liquid levels in LNGC tanks
- Vapour pressure limitations
- Maximum liquid pressure in terminal transfer lines (surge mitigation)
- Excessive vessel movements or mooring failure
- Extreme weather or winds above 35 knots (65 km/h)
- Thunderstorms in vicinity (see below table)
- Detection of abnormal situations by Process Control System
- Detection of alarms by the Safety Control System
- etc.

Thunderstorm warnings	
In 25 km radius	Pre-alert – vigilance period
Within 5 km	Cargo operations are stopped – security period
Cargo operation restarts	30 min after the last impact

9.13 End of Transfer

The receiving or unloading vessel shall notify the Terminal one hour prior to commencing cargo transfer ramp down.

10. Services and supplies

Vessel agent is to be notified **prior to arrival** of any service or supplies contracted, in order to get Port and Terminal authorisations and coordinate their delivery.

Bunkering, stores and supplies can only take place after the end of cargo transfer operations:

- after transfer arms have been drained and purged with nitrogen,
- with permission to start granted by Port Authorities and Terminal,
- providing that there is enough time available prior to departure.

It is the Master responsibility to watch for the **safety** of services & supplies alongside and to cease operations in case of problem.

It is the Master responsibility to alert Terminal, vessel agent and Port Authority about any **delay** which may affect the vessel departure schedule. Vessel services, including bunkering, shall never be rushed against safety in order to be ready for departure.

Terminal may require services and supplies to be stopped at any time for safety reason.

Under exceptional circumstances, limited provisions operations can be authorised for a limited time before the LNG transfer operations (and not during arm connection) with prior written agreement from both the Port and Terminal.

Note: Access of any vehicle is not permitted during the arms connection.

Stores, spare parts and supplies: From shore or by barge. Dangerous goods handling requires specific approval from Terminal.

Garbage disposal : A garbage disposal is available on the berth.

Crane : Mobile cranes of various types can be used on the berths. The working area is limited to a minimum distance of 35 m from vapour arm.

Oil bunkering : Oil bunkering by barge is allowed. Request for bunkering is to be sent to Elengy at least 5 days before vessel's call and subject to Elengy's acceptance and to the Shipper's confirmation. Bunkering operation is under full responsibility of the LNG carrier. (cf. Appendix 6)

Water supply: By truck or barge

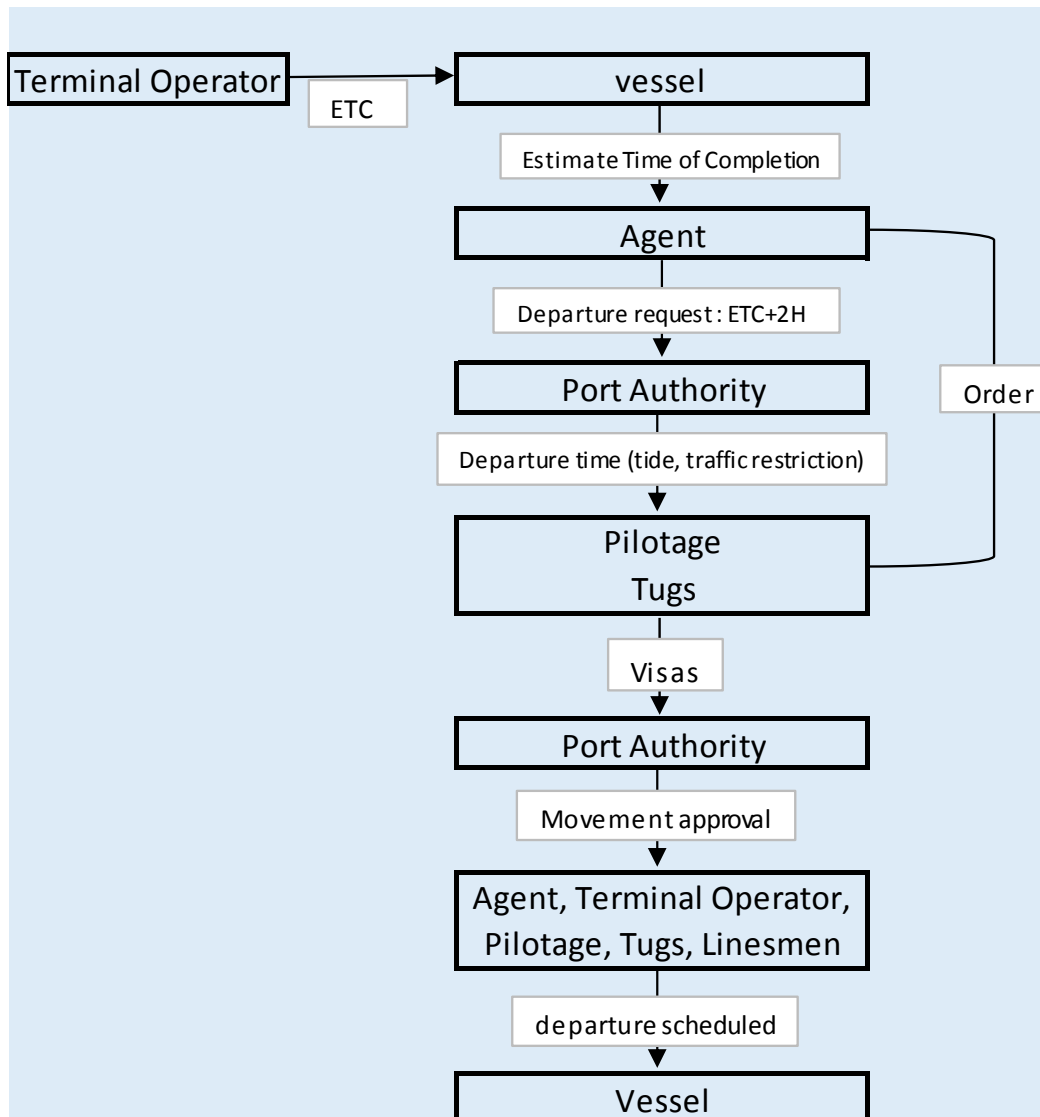
Nitrogen supply: Not available

Marpol oily waste: Contact agent for details.

Deballasting operation: Port Authority has to be informed.

Ballasting: The ballasting operation is to be performed during the unloading operations and have to respect the constraints of draft and trim specified by the Port Authority.

11. Un-berthing and Departure



Wind speed restriction for un-berthing is **25 knots**.

Port Authority and Pilots will advise pilot boarding and departure time to the vessel. Pilot boarding time is usually expected to be 1 hour before high tide. Terminal and vessel agent are to be notified immediately of any delay preventing vessel to leave in scheduled time.

Shore lines are cast off under supervision and assistance of Port linesmen boarding the vessel by the shore gangway.

All cargo operations and vessel services shall be entirely finished prior to start unmooring ship's lines.

Departure time is constrained by tides and currents in the Loire river. If, for any reason of delay, vessel cannot be ready in scheduled time, then departure is cancelled and vessel stays alongside until next appropriate departure window, depending on tide coefficient and traffic management (normally 12 or 6 hours).

12. Abbreviations and appendixes lists

Abbreviations :

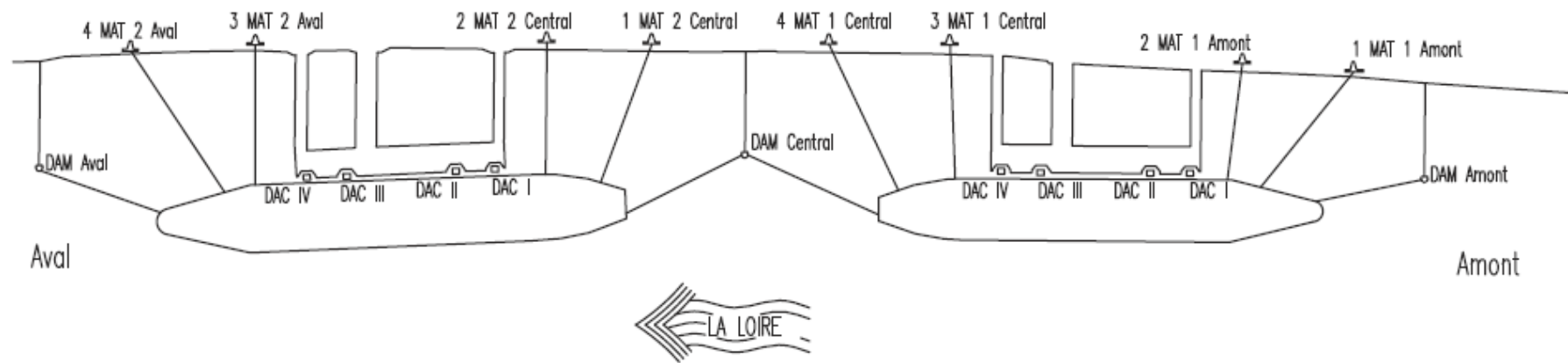
BOG : Boil off gas
 CD : Chart datum
 CTMS : Custody transfer measuring system
 DOS : Declaration of security
 ESD : Emergency shut down
 ETA : Estimated time of arrival (=vessel at pilot boarding station)
 ETB : Estimated time of berthing (= first line ashore)
 ETC : Estimated time of completion (= end of cargo transfer)
 ETD : Estimated time of departure (=pilot boarding time for departure)
 HD compressor : High Duty compressor
 HW : High waters
 IGC : International gas carriers code
 IMO : International maritime organization
 LOA : Length over all
 LW : Low waters
 OCIMF : Oil companies international marine forum
 POB : Pilot on board
 SIGTTO : Society of international gas tankers and terminals operators
 SSL : Ship shore link
 UTC : Coordinated universal time

Appendixes :

A1 Berthing and mooring equipment details
 A2 Berth 1 Access tower drawing
 A3 Berth 2 Access tower drawing
 A4 Berth 1 Arm envelope
 A5 Berth 2 Arm envelope
 A6 Oil bunkering safety rules

APPENDIX 1 :

Berthing and mooring equipment details



Aval is berth 2

Amont is berth 1

APPENDIX 1

		Downstream - Saint-Nazaire Berth2, downstream (-) wharf										Upstream - Donges Berth1, upstream (+) wharf						
		Head	Semi breast	Breast	Springs				Breast	Semi breast	Head	Head	Semi breast	Breast	Springs	Breast	Semi breast	Head
		1DAM2	4MAT2	3MAT2	4DAC2	3DAC2	2DAC2	1DAC2	2MAT2	1MAT3	1DAM3		4MAT1	3MAT1	All DAC1	2MAT1	1MAT1	1DAM1
Longitudinal position from vapour line	m	260	189	99	67	38	-41	-69	-112	-186	-249	252	192	105	Same as berth 2	-105	-185	-238
Distance to berthing line	m	19	103	104	3,6	3,3	3,4	3,8	96	92	5,9	14,2	97	97		85	80	12,8
QRH	Qty	3	4	4	2	2	2	2	4	4	3	3	4	4		4	4	3
Height above CD	m	8,4	8,4	8,4	8,4	8,4	8,4	8,4	8,4	8,4	8,4	8,4	8,4	8,4		8,4	8,4	8,4
QRH strength	tons	150	150	150	150	150	150	150	150	150	150	150	150	150		150	150	150

Remarks :

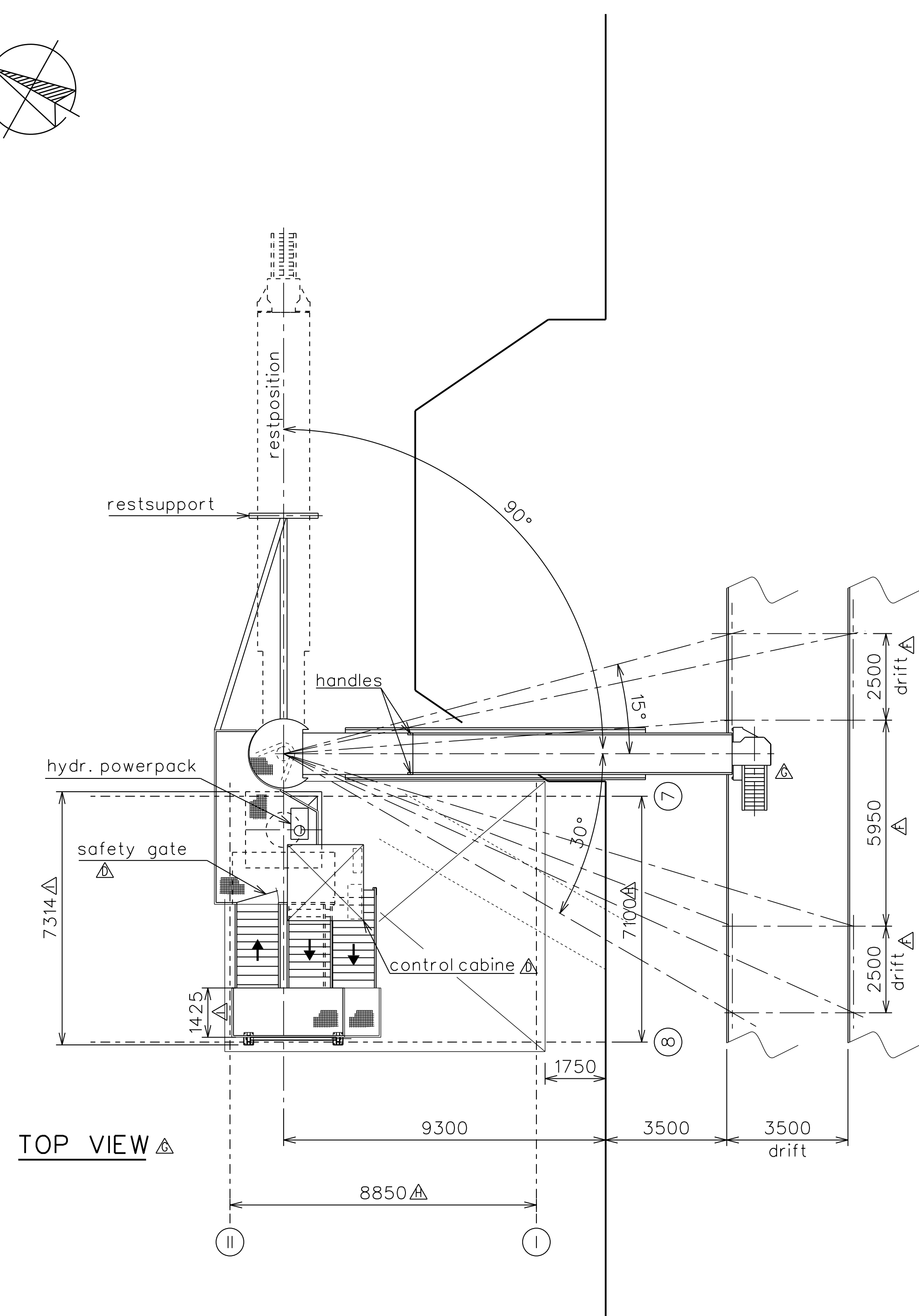
- Both berths are identical in design and operation.
- On berth 1, both outer breasting dolphins (1DAC1 and 4DAC1) are fitted with 5 hooks : 2 hooks (150 Tons) for large vessels and 3 hooks (75 Tons) for small scale vessels.

APPENDIX 1

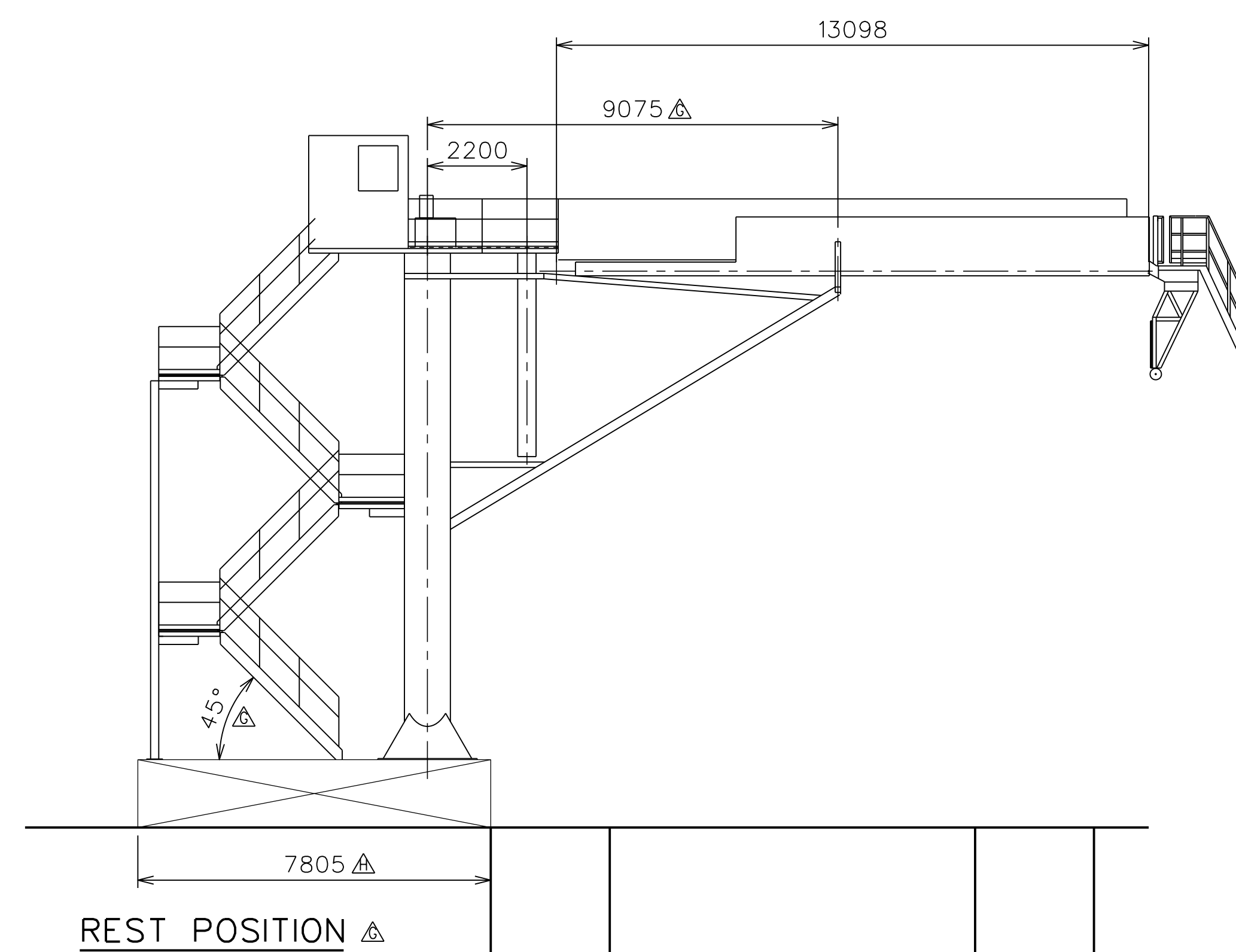
	<i>Position and size of the breasting dolphin</i>							
	Berth2 downstream wharf				Berth1 upstream wharf			
	2DAC4	2DAC3	2DAC2	2DAC1	1DAC4	1DAC3	1DAC2	1DAC1
<i>Longitudinal position from vapour line</i>	67	38	-41	-69	67	38	-41	-69
<i>Fender compression max. (meters)</i>	1,50				1,50			
<i>Maximum load(ton)</i>	187	202	201	193	187	202	201	193
<i>Transversal position (meters)</i>	3,6	3,3	3,4	3,8	3,6	3,3	3,4	3,8
<i>Max.energy (ton.m)</i>	230	220	220	230	230	220	220	230
<i>Contact width (m)</i>	2,2				2,2			
<i>Upper position above chart datum (m)</i>	8				8			
<i>Contact height (m)</i>	5,2				5,2			
<i>Contact surface (m²)</i>	11,4				11,4			
<i>Fender cell center height (m)</i>	5,9				5,9			
<i>Panel material</i>	UHMMV - PE				UHMMV - PE			
<i>Cell material</i>	Rubber, Round cell type				Rubber, Round cell type			

Fender type: Fenderteam CSS 1700 Grade 1.7 for the main fenders (external)

Fenderteam CSS 1450 Grade 2.9 for the secondary fenders (internal)

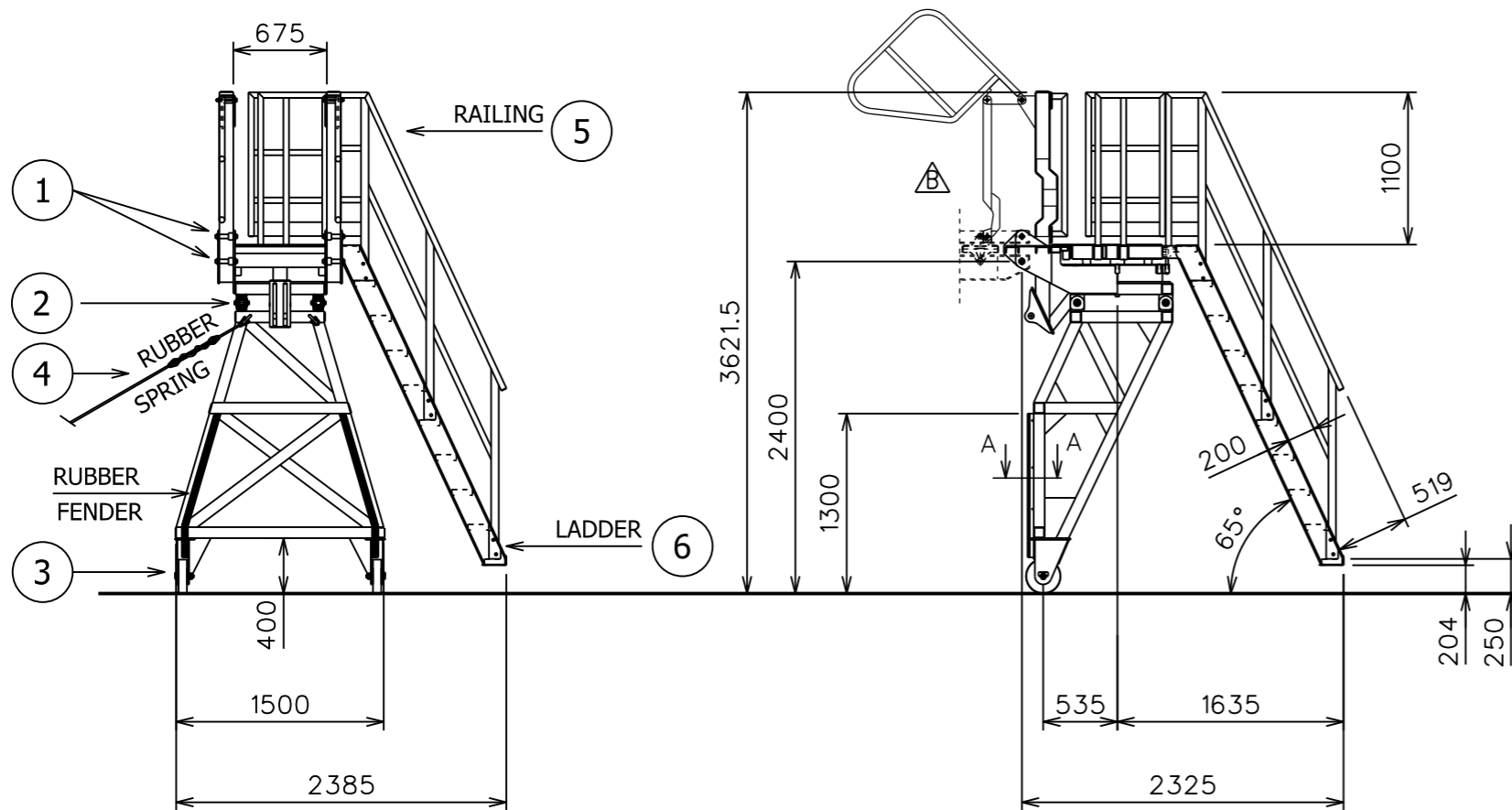


Berth 1 - Gangway tower

[illegible]

Berth 1 - Gangway tower

Rubber 38x50
VIEW A-A

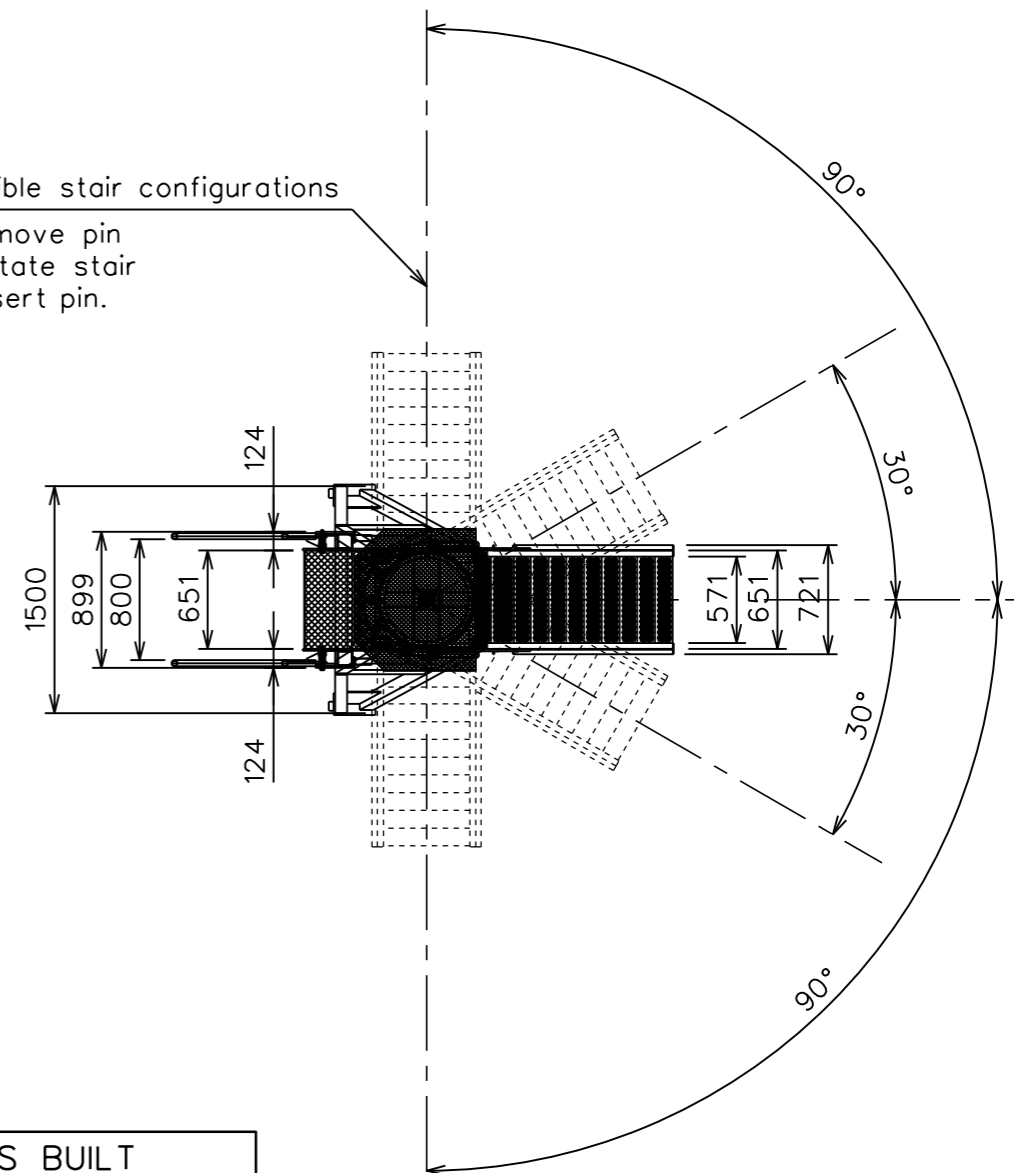


△ Stair turned 90°

△ Stair in line with gangway

△ possible stair configurations

1. remove pin
2. rotate stair
3. insert pin.



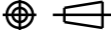
AS BUILT
by A. Altunay
date 16-05-2017

DIMENSIONS ARE IN MM

ITEM	QTR.	DESCRIPTION OF PARTS	MATERIAL
6	1	ladder	alum.
5	2	railing	alum.
4	2	rope \varnothing 9 mm length 7000 mm	polypropylene
3	2	deckwheels \varnothing 250	nylon
2	4	special pin for deckladder (break bolt)	alum.
1	4	connection to ladder	st.st.

		HJ	HJ
		A. Altunay	JOV
		16-5-2017	5-9-2016
D	C	B	A
Revisions			

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Project		Elengy - LNG Terminal - Montoir de Bretagne		BNO: 0778	
Description		Aluminium Deckladder			
Scale 1:50		Remarks		Dwg. No.	
Drwn. <i>A. Altunay</i>	08-07-2016			AD3.0381-04	
Chkd. <i>J. Jansen</i>	08-07-2016				
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Berth 2 - Gangway tower

