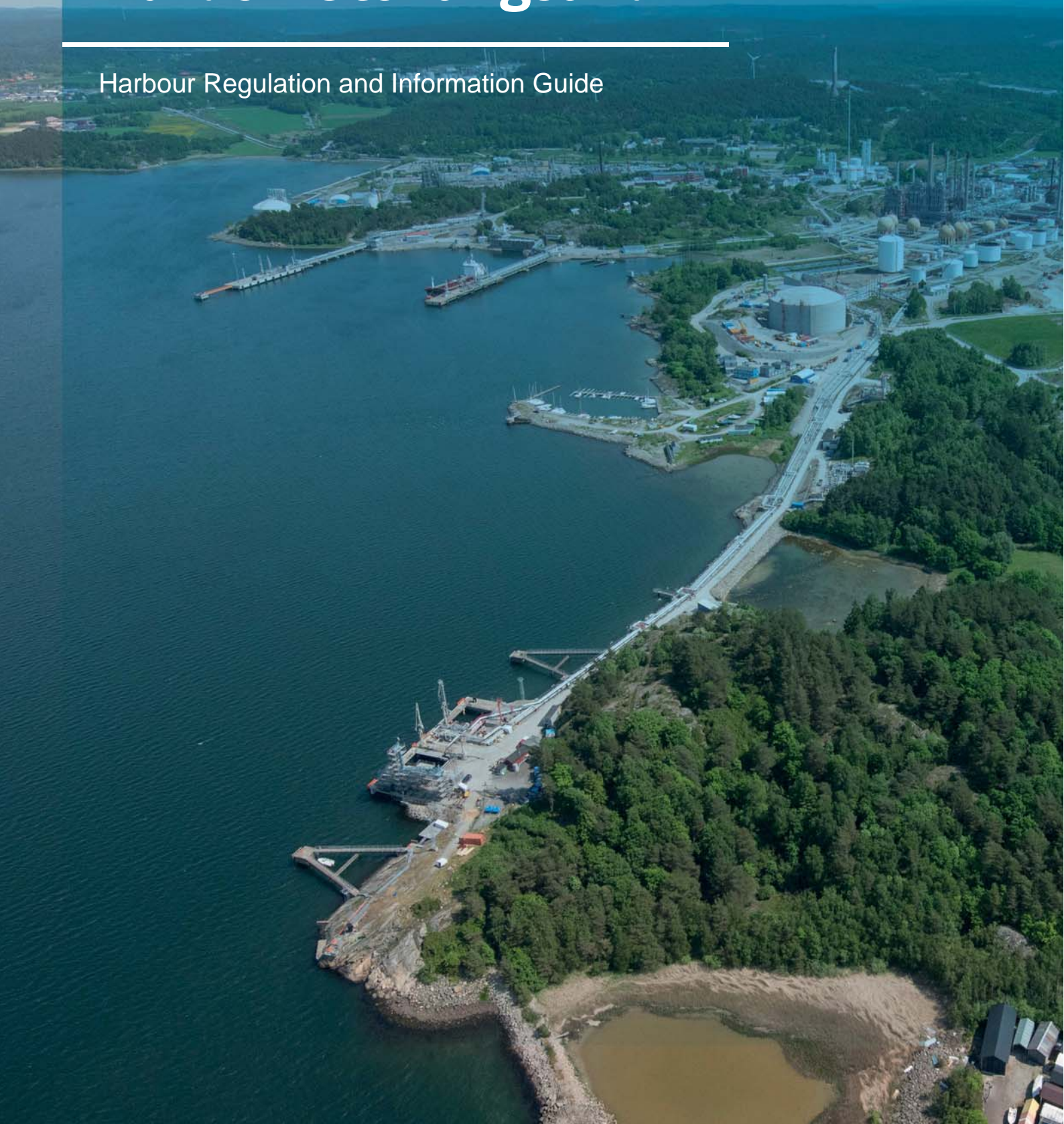


Havden Stenungsund

Harbour Regulation and Information Guide



12.7.2017

To the Master

Safety Requirements

As master, you are responsible for the safe conduct of operations on your ship while in port. However, port personnel, property and other ships may also suffer serious damage in the event of an accident on your ship, we accordingly request that you show understanding for the safety requirements set out in the ship/shore safety checklist.

These safety requirements are based on the company's procedures, which are accepted by the oil and tanker industries. We accordingly expect you and everyone under your command to adhere to them strictly throughout your stay at this plant.

For our part, we will ensure that our personnel do likewise and cooperate fully with you to our mutual benefit and understanding in ensuring that all operations are performed safely and efficiently.

To assure ourselves of your compliance with these safety requirements, we will send a member of our staff aboard your ship before the start of operations and thereafter from time to time. After reporting to you or your officer of the match, this inspector will join the officer to the match on routine inspection of the ship.

If we observe that any of these safety requirements are being infringed on your ship, we will bring this immediately to the attention of yourself or your deputy for corrective action. If such action is not taken within a reasonable time, we will adopt such measures as we consider being the most appropriate to deal with the situation and will notify you accordingly.

If you observe any infringement of these requirements by plant staff, whether on the jetty or on your ship, please bring this immediately to the notice of our representative who has been nominated as your contact during your stay in the port. Should you feel that any immediate threat is posed to the safety of your ship by any action on our part, or by equipment under our control, you are fully entitled to demand an immediate cessation of operations.

The plant representative in duty is: Shift supervisor. Phone 0303 87280 (Representative of PFSO)

Communication channel UHF:

VHF:

In the event of continued or flagrant disregard by any ship of these safety requirements of the attached harbour regulations, we reserve the right to stop all operations and to order the ship off the berth until appropriate action is taken by the owner and charterer concerned. It is hereby confirmed that the master has received the Havden Stenungsund Harbour Regulations and Information Guide, and has declared his willingness to abide by their provisions.

Signed, Area Master

Important notice!

Normal operation

The harbor area will be continuously manned when vessel is moored at the jetty. Communication between vessel and quay during cargo operation should be maintained by using portable radio. The radio must be returned to Borealis Loading Master after completed operation. Mobile phones and other electrical communication equipment of a non-approved type shall not be used outdoor within the harbor area including onboard the vessel.

Important telephone numbers:

Borealis Control room Cracker plant +46 (0)303 87 280 Production Leader
- " - Fax +46 (0)303 87 260

Loading Master	+46 (0)303 87 284
Port Security Officer	+46 (0)73 231 3594
Cracker Plant / Main gate	+46 (0)303 87 179
Havden Jetty Office	+46 (0)303 87 273

Stenungsund Logistics +46 (767) 820 978
logistic.cr.stenungsund@borealisgroup.com

Emergency

In case of fire or other emergency onboard, activate ship's fire alarm and contact immediately the fire guard on quay via the portable radio.

If not possible, contact Borealis Control room on following phone numbers or radio channel 1. Important: These numbers should only be used in case of emergency

Alarm N° Control room	+46 (0)303 77 16 43 (from external phone)
Borealis	112 (from internal phone Jetty office)

If not possible to reach Control room, alert external rescue service:

Rescue service: 112

Signal by series of prolonged blasts on the vessel's whistle. Assembly point in emergencies is at the harbor main gate.

Escape routes: See attachment

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Appendix 3A – Mooring recommendations

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Appendix 4 – Details of Chiksan loading arms at Havden Jetty

Pre-arrival information

Without unnecessary delay, and latest 24 hours before arrival, master shall through his agent inform Borealis of following:

- List of crew members and expected visitors
- Ship's Security Level at arrival to berth. Vessels operating under security level 2 or higher shall explicitly mention this to Borealis.
- Confirmation that vessel is ISPS certified
- List of previous harbours
- List of expected bunker, shop stores, spare parts etc. List shall be completed with copy of ship's/owner's order or other documentation identifying the expected goods
- Any request to pump ashore engine sludge including quantity

General Information

Berth position	58,05/11,48
Pilot boarding point	Hätteberget
Water depth in approaches	14,3
Minimum under keel clearance in approaches	10% of vessels draught
Maximum draught in approaches	12,8
Transit on tide	NA
Water depth alongside berth	14,3
Minimum under keel clearance alongside berth	0,5
Absolute maximum draught alongside	13
Dock water density	1,023
Date of last hydrographical survey	2011
Maximum length overall (LOA)	240
Connection	Hard arm
Maximum bow to manifold distance	120
Maximum stern to manifold distance	120
Maximum manifold height above water	21,2
Minimum manifold height above water	2,8
Maximum air draught	43
Type of seabed	Sand, mud, rock
Manifold normally used	Starboard
Ballast/slop reception facilities available	Only sludge
Are Fuel Oil Bunkers available by barge	Via berth only by truck, at anchorage
Are diesel oil bunkers available by barge	Via berth only by truck at anchorage

ISPS Code

Borealis harbour Havden operates according to ISPS code.

Certificate issued by: Swedish Maritime Administration

Harbour PFSO: Marcus Kierkegaard, Tel +46 (0)73 231 3594

Marcus.Kierkegaard@borealisgroup.com

Loading master on duty acts as PFSO and will on behalf of the PFSO make all arrangement and security coordination's with SSO.

Borealis Harbour Havden currently operates at security level 1 (one)

Pre-arrival information as listed above shall be sent to Borealis Cracker Gate (krackern.portvakt@borealisgroup.com), with a copy to Stenungsund Logistics (logistic.cr.stenungsund@borealisgroup.com)

All personnel in Borealis harbour should wear a Borealis identity card. The following categories have ISPS information and shall be allowed to enter ship: Harbour manager, harbour engineer, loading master, jetty operator, cargo surveyor, agent, ship chandler, pilot, marine surveyor.

In case of an ISPS incident Borealis will handle incident contacts with Swedish authority. Loading master will forward any changes of security level to ship. Communication between ship and harbour is by radio. (Supplied to the ship by Borealis).

Borealis is controlling the access to the port facility and monitoring the berthing area. The ship shall control the access to the ship and is responsible for the identity of all persons aboard and shall also monitor the area surrounding the ship.

Approved identification is mandatory for all ships personnel and visitors in Borealis harbour.

All visitors to the ship should be pre announced to Borealis Cracker gate (by ship or agent).

All stores to the ship should be pre announced to Borealis Cracker gate (by ship or agent) and a verification of the stores should be presented to the gatehouse guard before it is granted access to Borealis harbour. Ships personnel are responsible for inventory controls.

The ship shall inform jetty operator before any stores or garbage is handled from ship to the jetty.

Under normal situations and as long as both parties act at the same security level, a Declaration of Security (DoS) is not needed, unless a security instance is requesting one.

Navigation

Location

Borealis terminal Havden, Stenungsund is located at the East side of Askeröfjorden abt 50 km N of Gothenburg. The harbour is owned and operated by Borealis. The harbour is open for arrival and departure day and night, weather permitting and meeting below restrictions for navigation in darkness.

GPS coordinates 58 ° 05,22 11° 48,32

Tugs

Vessels shall use escort tug(s) at arrival and departure to the number as requested by the Harbour Master or Pilot . The minimum norms can be found on Sjöfartsverket website : <http://www.sjofartsverket.se/sv/Sjofart/Lotsning/Lotsomraden/Lotsomrade-Marstrand/Riktvarde--restriktioner/Bogsering/Bogsering-Marstrands-lotsstation/Stenungsund/#>

A stand-by tug needs to be in the area at all times for safety reasons. The industries in Stenungsund (Akzo, Borealis, Inovyn and Perstorp) have for this purpose made an agreement with BB Sverige. This agreement is operated by Petroport. This contract covers one tug to be the stand by tug for safety reasons and to be used as first escort tug if available.

Use of tugs when moving is compulsory for vessel with any malfunction in its regular manoeuvring equipment including but not limited to main engine, steering machinery, bow thruster.

Normally tugs are not available in Stenungsund but have abt 5 hours notification time after ordering.

Mooring of tug or any other vessel at the side of ship carrying, unloading or loading dangerous goods is strictly prohibited.

Anchorage

Ships waiting for available berth can anchor in one of following customary anchorages:

- At Askeröfjorden N of Tjörnbron
- At Älgöfjorden between Marstrand Pilot station and Tjörnbron

Anchorage is assigned by pilot in consultation with Borealis/Agent.

Port information

Vessel limitations

Arriving or departing vessels shall meet the following limitations:

L O A	: Max 240.0 mtrs
Draft	: Max 13.0 mtrs
Air draft	: Max 43,0 mtrs

Navigation in darkness

For navigation in darkness, L O A must not exceed 200 mtrs.

Handled products

Following products are handled at this terminal:

Import of: Propane
Butane
LPG-mix
Naphtha
Ethane

Export of: Propane
Butane
LPG-mix

Mooring

It is of outmost importance for safe operation that ships are securely moored and maintained in the correct position at all times. Loading arms or hoses shall not be connected until both ship's Master and Harbour Master have ensured that vessel is securely and safely moored. The master is responsible for ensuring that the ship is securely moored at all times, but it is the responsibility of both harbour and ship personnel to regularly monitor all the vessel's mooring lines to prevent undue movement of the ship.

Only ropes or wires with rope tail ends with minimum same working strength as the wires are to be used for mooring. All mooring lines working in the same direction shall be of same

material and have same elasticity. Use of solely polypropylene lines for mooring is not allowed.

Use of self-tensioning winches in the automatic position is strictly forbidden while vessel is moored. Brakes of self-tensioning winches shall be secured in locked position.

Based on arriving vessel's size and appearance and position of bollards and fenders, mooring shall be in accordance with layout plans showed in appendices 3A and 3B. Diagrams in appendix 3C indicate limits for safe mooring at various wind speeds, number and material of mooring lines and various winch brake capacities.. It is compulsory for the vessel to use boatmen at arrival and departure.

Harbour regulation

Harbour Master

Harbour Master is the Area engineer for tank field and jetties or, in his absence, the Production leader in the Control room of Borealis Cracker plant. At normal conditions, Borealis Loading Master will act as their deputy representative. The Loading Master can be reached using the communication radio or telephone in the watch house on quay.

Harbour Area

The Havden harbour area is defined as the fenced land area between the harbour's guarded entrance gate and the quay and the area inside the seaward safety zone. Within the sea safety zone, which reaches 50 meters from the quay, all ships movements are prohibited unless authorized by Borealis.

Liability

In addition to what is stated in quarantine, pilot, Custom and other maritime legislation, it is the obligation of the ship's master to understand and comply with the applicable safety and other regulations within the harbour area. If needed, he or she can obtain this information from the Harbour Master or ship's agent. It is the ship's master's responsibility during the full period the vessel is berthed alongside.

Whenever the ship's master is not in command, his deputy officer is subject to the same obligations and responsibilities as what is imposed upon the master in these Harbour regulations and all other applicable legislations.

Visitors

Latest on arrival, the master shall provide Borealis a list with names of expected visitor(s) to the ship and the crew member(s) expecting the visitor(s). All visitors must identify themselves with a valid identification document at Borealis' Havden gate to be allowed access to the harbour area. Only authorized persons or persons with entry permits issued by Borealis area allowed to pass through or stay within the harbour area and must comply with any restriction imposed upon them. In addition, visitors to the ship berthed alongside must have permission of the ship's master.

Entrance to ship and harbour area

People entering Borealis Harbour Havden as visitor shall at all times be attended by authorised Borealis personnel, harbour personnel or vessels' crew members.

Within the harbour area, it is mandatory to minimum wear protective helmet with chin strap, safety goggles and reflecting vest, which is available at the gate house and on the jetty.

All people shall stay on the road between the gate and jetty and shall follow the safest route to the ship/shore gangway. It is strictly forbidden to access the pipeline rack, unless a specific authorisation is obtained from Borealis.

Persons seeking access to the harbour area may be searched prior to access being permitted.

Intoxicated persons

Persons appearing to be intoxicated or under influence of drugs will not be allowed into the harbour area and shall not be permitted to participate in the loading/discharge operation.

Sexual services

Promotion or exploitation of other human being providing sexual service against payment (trafficking) as well as procurement of an occasional sexual relation against payment is prohibited and, according to Swedish law, to be punished by imprisonment. Furthermore, Borealis emphasize in its ethics policy that Borealis seek to increase awareness of human right and Borealis take seriously any allegation that human rights are not properly protected or respected within our sphere of influence. Failure to comply with this will be reported and may result in reassessment of the vessel's status.

Handling goods and other items to/from the ship

Information of planned deliveries of ship stores, spare parts or other items to the ship shall, if possible, be pre-advised to Borealis via the ship's agent in good time before vessel's arrival. Such information shall include documentation, e g order-sheet identifying the goods. Arrival goods shall be identified and accepted by responsible ship's officers in conjunction with Borealis' personnel before the goods can be allowed into the harbour area. Goods shall be accompanied by Borealis' personnel during the transport between the harbour's gate and the ship. This procedure also applies for smaller items, e g mail, to the ship.

Handling of goods to and from the ship must be handled before or after cargo loading/unloading. Only small hand-carried items may be taken onboard during cargo operation. Use of cranes on board or on quay is prohibited when loading arm is connected.

Gangway

The ship shall provide and tend a safe gangway for passage between the ship and the quay. A safety net shall be installed underneath the gangway extending from the ship's rail to the quay. The gangway shall be well lit during darkness and poor visibility.

Use of the harbour's hydraulic driven gangway tower will be considered in each case.

Ship stability

The ship's master is responsible for maintaining the ship's stability at all times during cargo and ballast operations. Special attention should be paid to trim/list conditions, which could endanger the safe operation of the connected hard arm.

Pre-operative meeting

Before any operation commence, a pre-operative meeting shall take place between Borealis Loading Master and the ship's master or cargo officer.

They will jointly:

- Go through, complete and sign the Ship/Shore Safety Check list
- Update and verify pre-arrival information of declared Security level and actions taken in connection therewith
- Discuss the expected visitors and deliveries of goods etc.
Agree on handling of waste, i.e. garbage, sludge
- Evaluate any deficiencies revealed by the Check list and decide which additional precautions are required. Borealis reserves the right to refuse to load or unload a vessel if such requirements are not met.
- Evaluate and agree on procedure for sampling, ullaging and temperature reading of ship's cargo tanks. Borealis reserves the right to draw any tank samples considered necessary prior to, during and after cargo operation.
- Evaluate and agree on cargo operation procedures including:
Quantity and quality to be discharge/loaded
Loading/discharge rate
Emergency shut-down procedure
Actions to be taken in case of emergency on board or on shore

Cargo operational procedures

Cargo operation shall not commence until all safety checks have been carried out to the satisfaction of Borealis Loading Master and responsible ship's officer.

The Loading Master and ship's officer shall jointly check and agree the loading arm(s)/hose are correctly connected to the ship's manifold. When loading LPG on fully ref vessel, the vapour return hose must always be connected.

All doors, valves or openings which lead from the tank deck to accommodation or machinery spaces should be closed. This also applies for valves and openings at any level which overlook the tank deck. Ventilators should be trimmed to prevent the entry of petroleum gas.

Prior to commencement of operation, sufficient fire hoses to cover the deck area and manifold should be run out and connected to the fire main, ready for immediate use.

Sufficient number of crew members shall at all times be kept onboard under the supervision of a responsible and experienced officer to effectively handle routine work and any type of emergency situation that may incur during the vessel's stay.

The sighting and ullage ports of cargo tanks must be kept closed and secured when not used. After permission from Borealis Loading Master, they may be opened temporarily for sampling or ullage/temperature in case of failure of ship's remote operated tank gauging equipment.

All cargo and bunker connections must be securely blanked and properly and fully bolted when not in use.

Signal while ship is alongside jetty

Vessel carrying cargo of naphtha, LGP or ethane must fly flag "B" of the international signal code by day and, during darkness or low visibility, exhibit a red light that is visible all around the horizon and located above the upper level of the superstructure.

Guard on deck and quay

A responsible crew member, fluent in English and equipped with communication radio, must at all times remain on deck during cargo operation to survey ship's cargo operation equipment and to ensure that unauthorized persons are prevented to enter the ship.

In addition a guard shall, appointed by the terminal, remain on the quay to survey the manifold and connected cargo equipment from shore.

Illumination and surveillance of ships offshore side

Ship's personnel shall at all time, considering the declared Security level, keep necessary supervision of the ship's offshore side. This side must be satisfactorily illuminated during darkness.

Weather precaution

Prevailing wind direction in harbour area is south-westerly/westerly.

At a wind speed of 20 m/s or higher :

- Vessels are not allowed to go alongside or shift position at the jetty when the wind speed exceeds 20 m/s, unless explicitly instructed by the loading master.
- When the vessel is already alongside the jetty :
 - The cargo operation should be stopped and cargo arms/hoses disconnected.
 - The ship/shore gangways shall be removed. They can be temporarily replaced for urgent matters if considered safe by the loading master
 - Mooring lines should be inspected and closely monitored. If necessary, additional mooring lines should be assembled. Parallel mooring lines shall be checked that they are equally tightened.
 - If the vessel movements are exceeding the safe margins and it cannot be controlled by tightening mooring lines, two escort tugs to be standby for emergency evacuation.
 - The terminal can instruct the vessel to vacate the jetty if that is considered the safest option. This shall always be done in close communication and cooperation with the master, pilots and tug boat personnel

In case of thunder/lightning in the vicinity, the loading or discharging operations shall be stopped and a check shall be made to ensure that all tank openings are gas-tight closed.

Vacation of berth

The vessel shall, after completion of cargo operation, document handling and, if applicable, ballast loading, depart from berth as soon as possible considering applicable restrictions.

Safety regulations

Safety and protective equipment

It is the obligation of the ship's master to ensure that all prescribed safety equipment onboard is in full working order. The vessel's firefighting equipment, including main and emergency fire pumps, must be held ready for immediate use.

Inspection

By Borealis personnel

Borealis personnel shall at all times be entitled to board the vessel alongside the jetty to verify that the Harbour regulations and other applicable regulations are complied with and that cargo equipment in use is in good working order.

By Governmental Port Authority

Duly authorized representatives for the Governmental Port Authority, responsible for the governmental handling of port security issues pursuant to international ISPS Code, have the right to inspect the harbour and to go on board vessel alongside the jetty to verify that the security system and adherent security equipment onboard fully comply with applicable ISPS regulations and are in satisfactory condition for the service in which the ship is used.

Electrical equipment

All electrical equipment on board, fixed and mobile, must be of a type approved by appropriate authority for use in the intended space and maintained in good condition.

Maintenance and repair of electrical equipment is prohibited on board and on quay, if not jointly authorized by the Harbour Master and the ship's master and hot work permit has been issued.

Loading arms and hoses connected to the ship's manifold are fitted with insulation flange. Earthing cable will therefore not be connected.

Use of portable electrical equipment on deck or quay

All use of portable electrical or electronic equipment of non-approved type, such as radios, CD players, tape recorders, mobile telephones, radio pagers, electronic calculator, photographic equipment, is prohibited on tank deck, on quay and in all spaces where flammable vapours may be encountered (e.g. pump room).

Repair, Hot work

Any repair or maintenance work requires pre-approval from Borealis. If written permission has been granted to undertake repair, a list specifying the repair works and the names of the persons carrying out the repair shall be submitted to the Harbour Master prior commencement of work.

Machinery repair or other repair work that might immobilise the vessel or prevent the vessel from leaving the harbour in an emergency shall not be commenced without prior permission in writing from the Harbour Master.

The vessel's propellers berthed alongside jetty must not be set in motion except immediately prior to the vessel's departure and then only at low speed, unless specific permission has been given by the Harbour Master. Under no circumstances will running of propellers be permitted while hard arm or hose is connected to the vessel.

Motor vehicles

All motor traffic within the harbour area is prohibited except for following:

Borealis vehicles and emergency vehicles belong to the Rescue service.

Persons with permission of authorized Borealis personnel have the right to drive to the western parking area in front of the blocking bar. Vehicles that has been given such permission will be accompanied by Borealis personnel or personnel authorized by Borealis. A written hot work permit, issued by responsible personnel in Borealis control room, is always and in each case mandatory for driving any motor vehicle beyond the blocking bar.

Parking of vehicles shall always be made without blocking roads and/or fire fighting equipment.

Prevention of sparks

Connecting and disconnecting loading arm and hoses and any other operation on deck and quay involving use of metal equipment or tools must be performed in a manner that avoids the generation of sparks.

The vessel's funnel(s) must be equipped with efficient spark arresters. Soot blowing and excessive funnel smoke is prohibited and immediate steps must be takes to eliminate sparkling from the funnel(s).

Use of naked flame

All use of naked flame is strictly prohibited except:

- in places designated for hot work under a written permit issued by the Harbour Master
- in approved smoking areas

Note! All equipment likely to causes sparkling should be treated as naked flames.

Boilers

Boiler rooms shall be provided with satisfactory ventilation. Doors and other openings facing the cargo deck shall be kept closed.

Kitchen

Use of fire in the kitchen or pantry is not permitted. Cooking and other preparation of food must be made on electric or steam driven heating devices.

Smoking

Smoking is strictly prohibited on ship's tank deck and in all other spaces onboard where inflammable vapours may be encountered and within the harbour area ashore.

Smoking is only permitted in approved smoking room onboard selected by the ship's master. Designated smoking places should be posted with appropriate notices.

Matches and lighters must not be carried outside the smoking rooms to ship's tank deck, to quay or to other spaces onboard where inflammable vapours may be present.

Pollution and pollution prevention

The utmost care must be exercised when handling cargo, ballast and bunkers in order to avoid any kind of spillage into the sea.

Any leakage or spillage must be reported immediately to Borealis and all efforts to limit and recover the spillage must be taken.

According to Swedish law, any pollution including oil spillages from vessel must be reported to the authorities.

Prior to commencement of loading, discharging or bunkering of oil products, all scuppers at main deck level, through which oil could escape in event of spillage, must be effectively plugged.

In the event of leakage from pipeline on board or on quay, the cargo operation must be stopped immediately and shall not be resumed until the leakage is effectively repaired and spilled product has been removed.

According to law, it is prohibited to discharge or throw out fuel or sludge oil, cleaning mass from such oils or any other liquid that could cause fire hazard or pollution of water.

At outboard work, vessel must prevent paint spillage and other pollution of the sea or jetty.

Wastes

Borealis will, free of cost, receive engine sludge and wastes such as:

- oil from fuel and lubricant oil separators
- oil contaminated bilge water
- oil contaminated wastes

subject to

- Borealis is advised in office hours lasts 24 hours prior planned delivery of sludge

- Borealis is given opportunity to receive the sludge/waste during ordinary working hours
- The sludge/waste is delivered at agreed time

Above is also applicable for other pollutants such as solvent wastes, paint wastes, batteries.

NB! Handling of sludge/wastes shall not be done during cargo operation.

According to law, it is also prohibited to discharge or throw out any kind of waste, liquid or solid that may pollute water or cause other discomfort. Wastes must be retained in suitable receptacles on board.

Vessel must effectively prevent sewage and/or toilet wastes to be discharged to the jetty or the sea.

Containers for disposal of sorted wastes are located on the quay. See appendix 8 for description.

It is the obligation of the crew to dispose wastes to the correct container in sealed packages. Failure to sort the waste according to marking will be corrected by the Port or other party and all costs will be upon the Vessel.

Uncleaned barrels or barrels containing rests of environmentally hazardous substances shall be well marked before they are deposited ashore.

Tank cleaning, steaming and venting of cargo tanks and abnormal smoke emission including soot blowing are prohibited.

Ballast water

Segregated ballast water tanks must be checked with respect to there being oil in the water, before deballasting starts.

During deballasting an intermittent control of the area around the vessel must be carried out by the ship's crew. Floodlights, if needed, may be used during night time

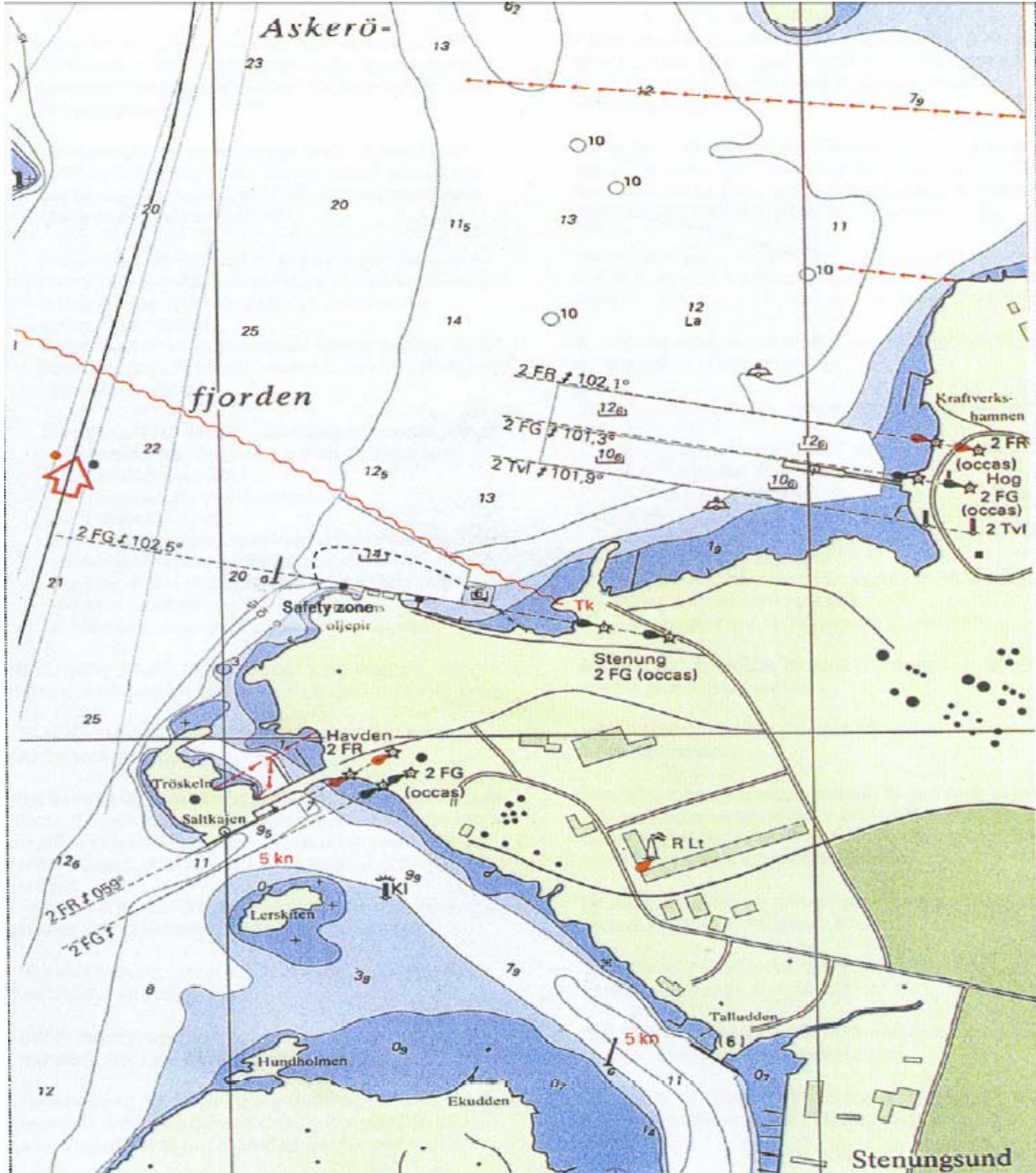
There is no possibility to discharge oily ballast water to shore tank at this facility.

When loading ballast water, pump must be running before bottom valve is opened.

All costs for cleaning up after pollution of oil, soot, waste etc., which originates from a ship, is to be paid by the ship/owner/insurance company, irrespective of what or who on board the ship caused the pollution.

Appendix 1

Map of harbour area with safety zone



Appendix 2

Fire equipment and warning system in harbour and map of escape routes

Fire equipment

Ineos Fire water

The fire water at Havden is connected and supplied by Ineos through a 400 mm line which is 500 m long

Capacity: 900 m³/h

(Ineos fire water pump capacity: 2 x 1100 m³/h)

Fire pumps can, if needed, be operated from the control room or from Borealis' pier.

3 ea fire hydrants

2 ea fixed fire monitors, located west and east of the pier

1 ea tower mounted foam/water monitor with a capacity of 3000 l/min. This monitor can be remotely operated. Underneath the pier there are 4 ea fixed 400 l/min medium foam pipes.

There is concentrated foam for both monitors and pipes to last for approximately 30 min.

In the jetty watch house, there are 40 chlorine masks for use in event of a release of chlorine.

Warning system

This includes a gas warning system and a fire warning system. The warning system will start automatically in the event of gas and/or fire detection. It consists of warning lights at the gate and pier, a sound emitter in the harbour and indicating lamps in the gate watch house and in the control room.

A PVC plant, which is handling chlorine, is located south of the harbour area.

In case of release of chlorine, a recorded message indicating chlorine danger and actions will be announced in Swedish and English through speakers. The alarm is tested every 1st non-holiday Monday of the month at 09:05. 40 chlorine masks to be used in case of a release are available at the watch house on the jetty. See also app. 6D Safety Data Sheet for chlorine.

Escape routes



Assembly point

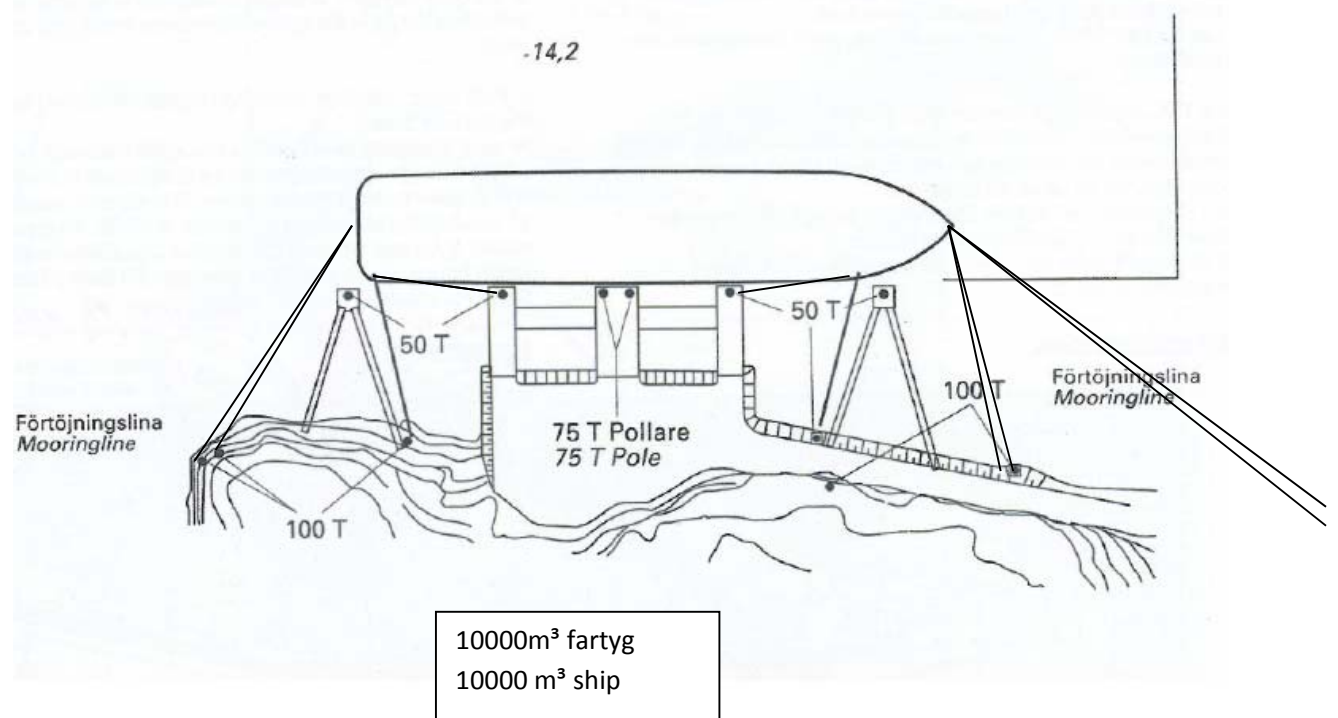
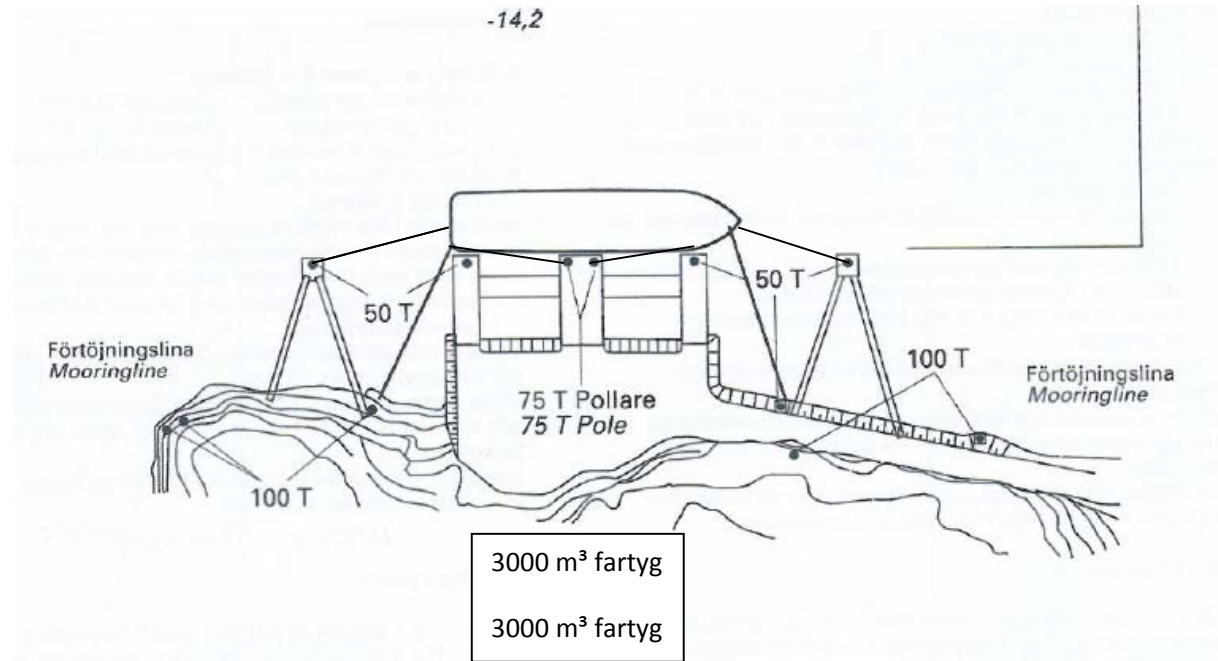


Escape routes

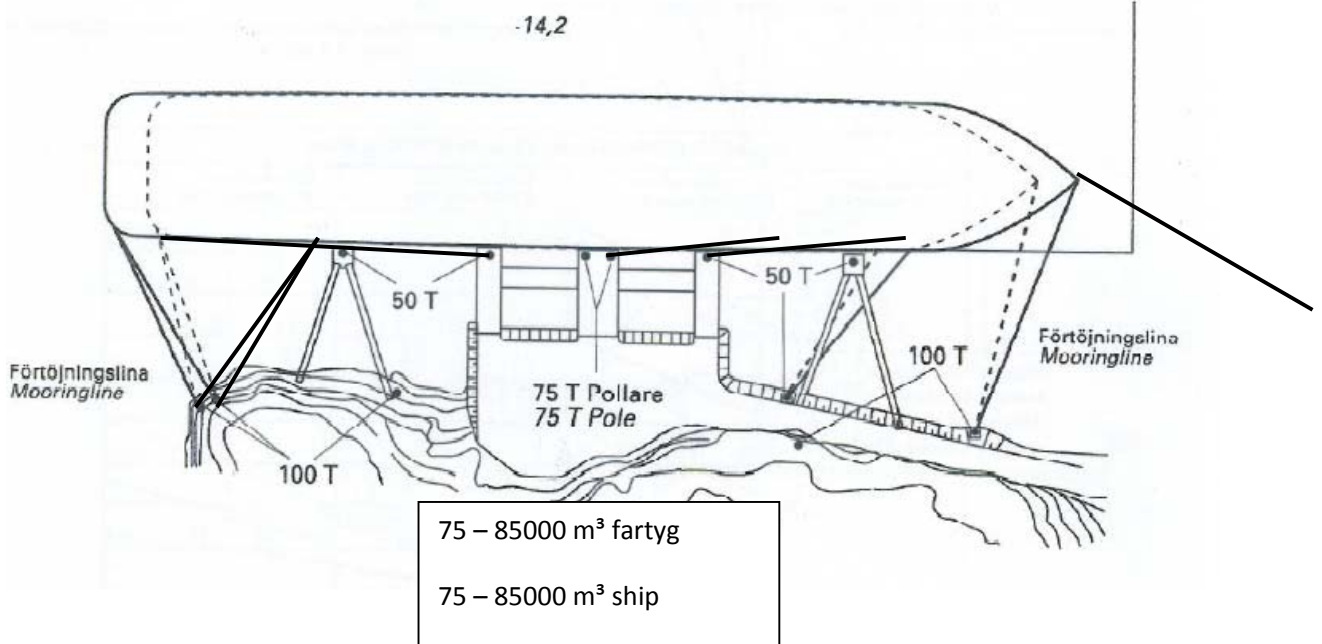
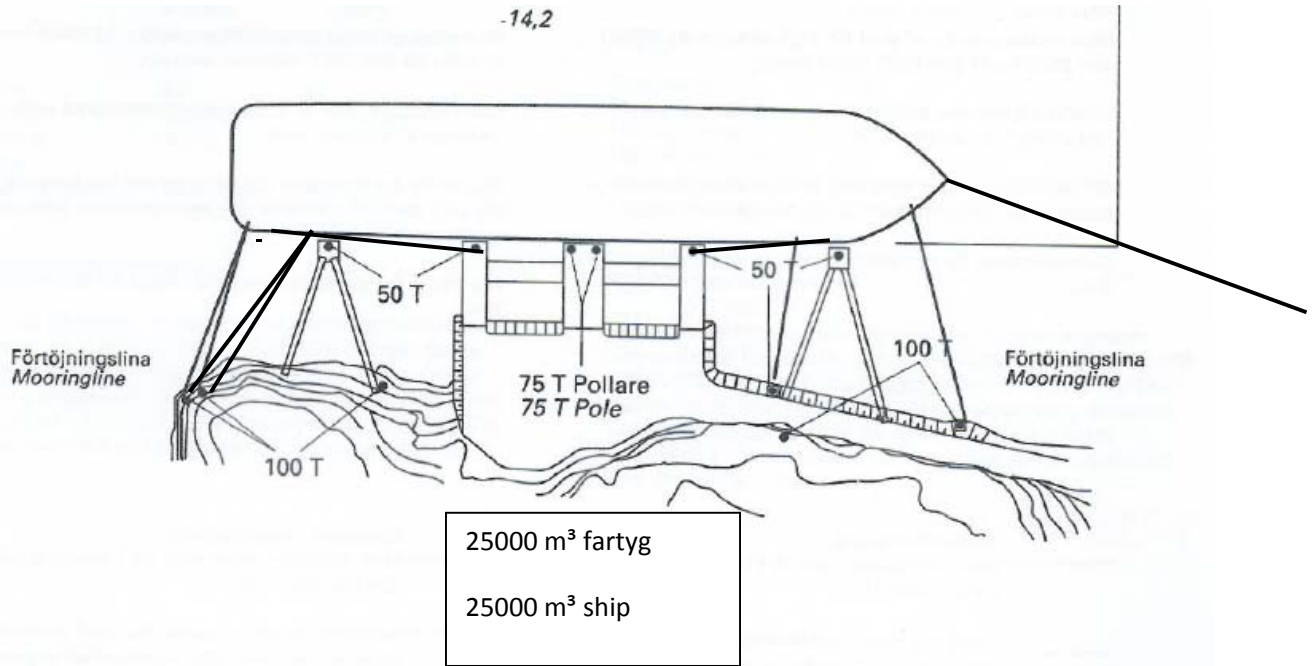


Appendix 3A

Mooring recommendations



Appendix 3B
Mooring recommendations



Appendix 3C

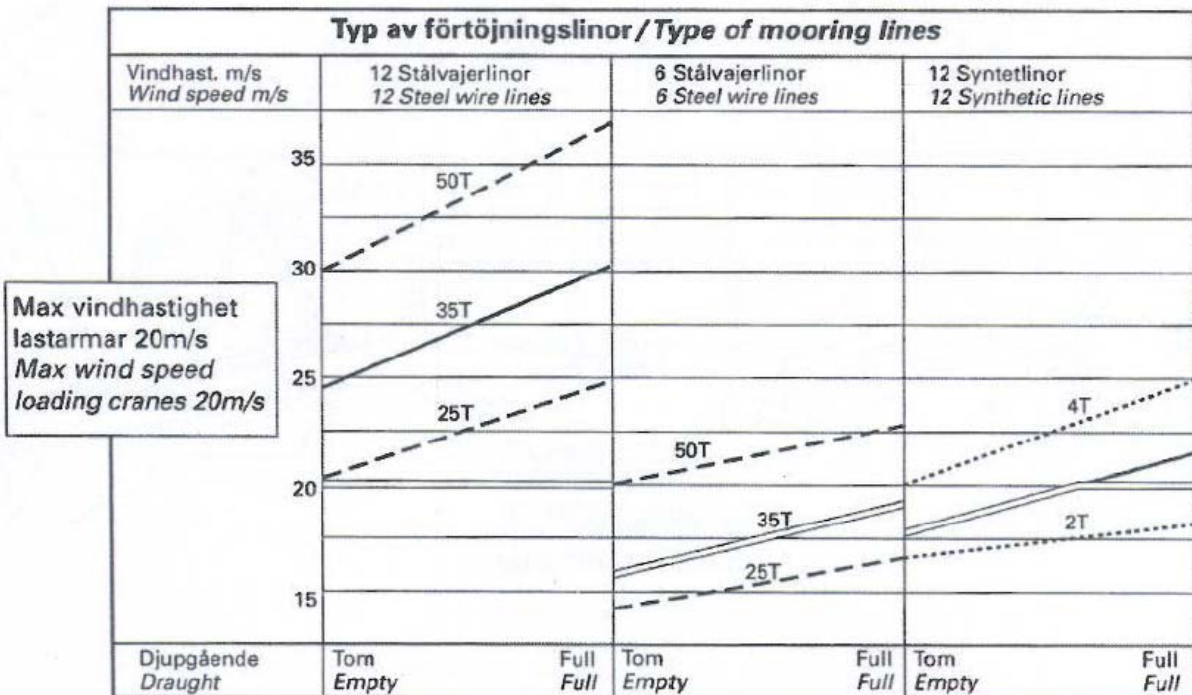
Max allowed wind speed

Max allowed wind speed LGP-vessels > 31.000m³ and 28.000 – 38.000 DWT Naphtha vessels.

Wind speed is max in the wind gust measured with “Borealis harbour Havden’s” anemometer.

The limits are indicated for wind across the alongside of the ship and are based on the arrangements indicated on the previous pages.

The limits for synthetic lines are based on movements of 3 m.



Character identification:

- Max adhesion force with 35 T winch brakes.
(Breaker limits 55 T)
- - - - - Indicated at which speed the load crane/hose shall be removed and loading/discharging interrupted.
- Max allowed wind speed with various winch brake capacities, 25 T and 50 T.
(Breaker limits 40 / resp. 80 T)
- Max wind speed with various tightness of lines, 1 T och 4 T

Appendix 4

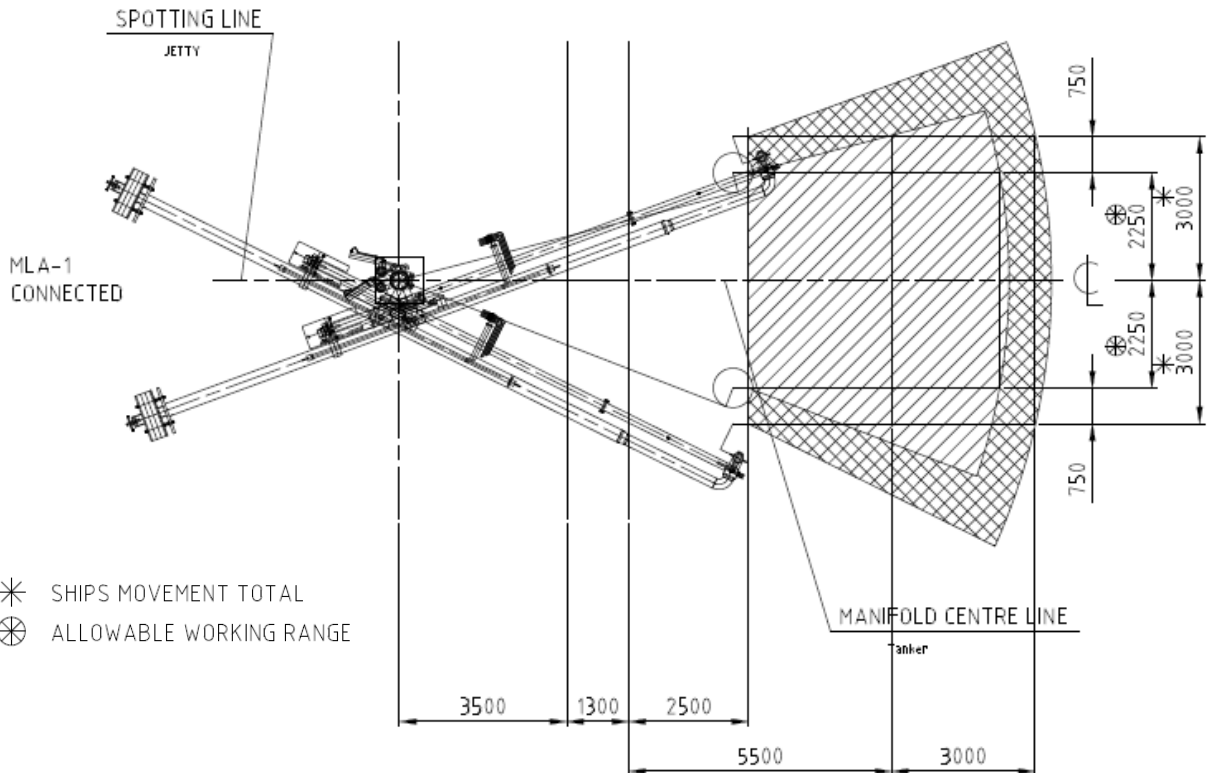
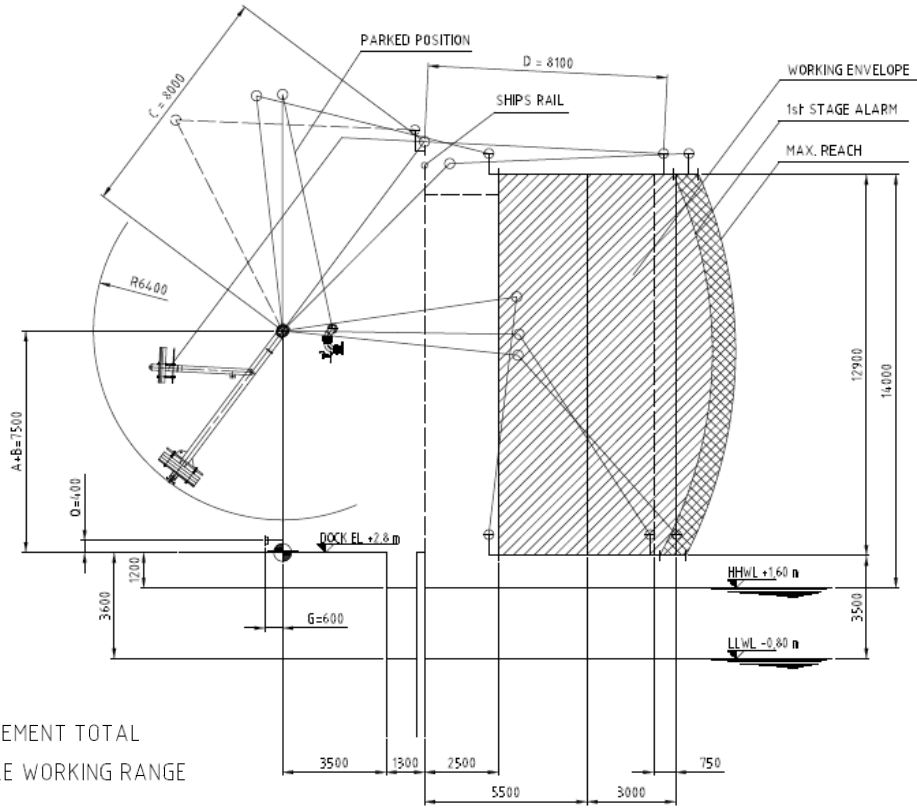
Details of loading arms at Havden jetty

	LA – 704 (ETHANE)	LA – 703 (Naphtha)
Dimension:	10"	8"
Max op. pressure:	10,4 bar	10 bar
Min op. temp:	-105°C	-10 °C
Max allowed discharge rate:	1900m ³ /h	1000 m ³ /h
Max wind speed:	20 m/s	20 m/s

Remote operated valves

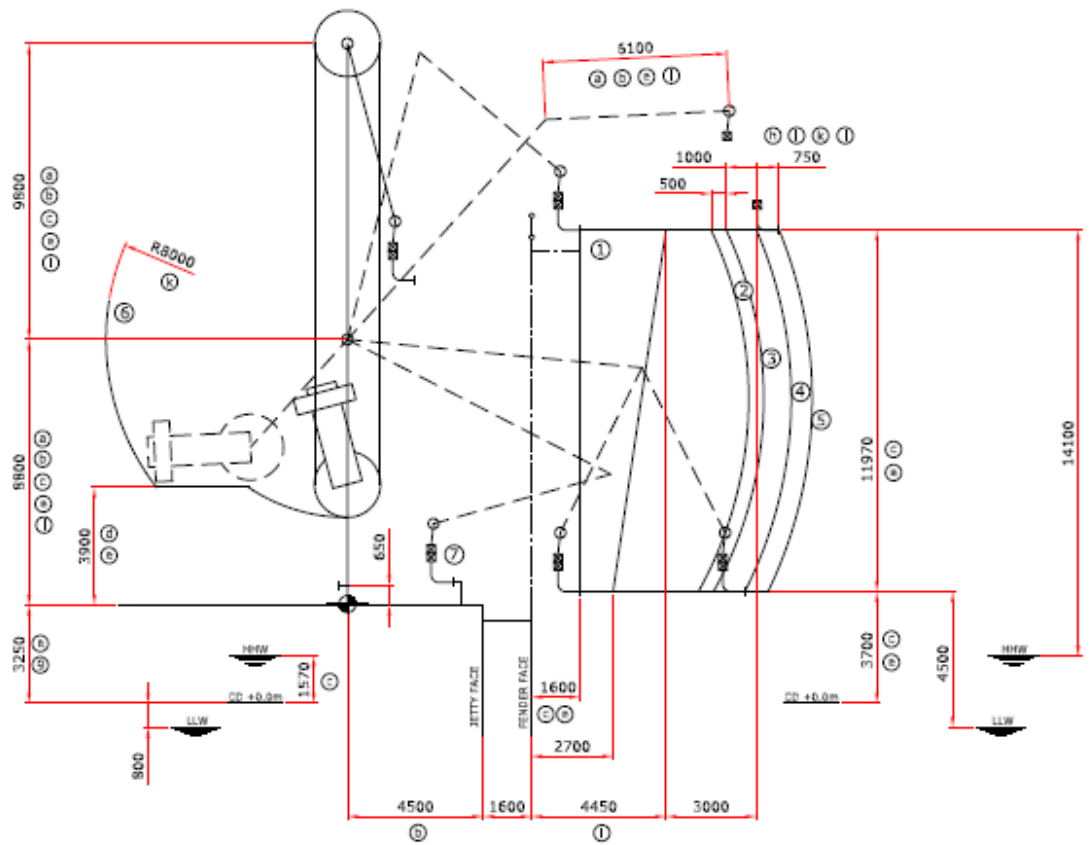
There are four remote operated valves in the pipe system connecting to the loading arms. One in the LPG pipeline (ROV-731), one in the butane pipeline (RBV-944) and one in the naphtha pipeline (RBV-762) and one in the Ethane pipeline (EBV-744). The valves are located on the quay. These emergency shutdown valves can be operated at the quay, at a control panel located by the road between harbour gate and the quay and from the cracker control room.

LA-703 Naphtha



LA – 704 Ethane

- ① WORKING AREA
- ② PRE-ALARM ①
- ③ ESD1
- ④ ESD2
- ⑤ LIMIT LINE
- ⑥ COUNTERWEIGHT AREA
- ⑦ MAINTENANCE POSITION



LA - 704 Ethane

