

METHANOL

BUNKER OPERATING REGULATIONS

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1. Introduction

GENERAL

This publication specifies the Port of Gothenburg's regulations regarding methanol handling and methanol bunkering in the Port of Gothenburg and adjacent anchorage areas. These regulations are valid in combination with Port of Gothenburg general harbour regulations.

DEFINITIONS

Hazardous area – zones 0, 1 and 2 in which an explosive gas mixture is expected to occur during normal handling in accordance with IEC 60079-10 and IEC 60092-502.

Safety zone – an area that must be established around the methanol station/facilities to control ignition sources and ensure that only qualified personnel and activities are allowed in the area that could be exposed to flammable gas in case of accidental release of or other incident involving methanol during bunkering.

Security zone (No movement zone) – an area that must be defined and established around the methanol bunkering area to monitor and control external activities e.g. ship movements or vehicles that can lead to incidents that threaten the operation. The security zone may result in limit access for personnel and/or public. The security zone will always be larger than the safety zone.



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2. Methanol bunker operation regulations

2.1 GENERAL

All bunkering operations in the Port of Gothenburg harbour area are subject to the Port Bye-laws and Port Regulations. In order to perform ship to ship bunkering the following conditions must be met:

- The bunker vessel should have accreditation from Port of Gothenburg (see 2.1.1).
- The receiving vessel should comply with the interim guidelines for safety of ships using methyl/ethyl alcohol as fuel (MSC.1/circ.1621) as fuel.
- The terminal must have a Port of Gothenburg-approved safety management system and routines for allowing bunker operations alongside terminal berths with or without simultaneous cargo operations.
- All bunkering operations must be approved by Port of Gothenburg before initiating any operation.

2.1.1 Bunker vessel criteria

The bunker vessel must:

- Be built or rebuilt according to IBC code and comply with the IMO interim guidelines and standard SIS-CWA 17540:2020 or similar.
- Have certification from STA or recognized Class society.
- Reviewed by The Swedish Transport Agency.
- Be inspected according to the Green Bunkering concept.
- Have a class approved bunker procedure and operating instructions. Complying with the applicable uniform interpretations and requirements posted by IACS.
- Personnel onboard to have adequate training and certification according to STCW code for IBC vessels.
- A risk assessment should be conducted to ensure that risks arising from the use of methyl/ethyl alcohol fuels affecting persons on board, the environment, Fire hazards, the structural strength, or the integrity of the ship are addressed. Consideration should be given to the hazards associated with physical layout, operation and maintenance, following any reasonably foreseeable failure.
- Present a case study on previous ship to ship operations and provide the port with any previous non-conformities.

2.1.2 Receiving vessel criteria

Comply with the IMO guidelines for safety of ships using methyl/ethyl alcohol as fuel (MSC.1/circ.1621) as fuel. SIS-CWA 17540:2020 or similar.

Have a safe bunkering, procedure, which is carried out according to the approved ISM manual onboard approved and complying with the applicable uniform interpretations and requirements posted by IACS.

Personnel onboard to have adequate training and certification according to STCW code for IBC vessels. Additional training requirements for personnel involved in bunkering operations.



2.2 APPLICABLE REGULATIONS, STANDARDS AND PUBLICATIONS

- National Regulations.
- IMO – for safety of ships using methyl/ethyl alcohol as fuel (MSC.1/circ.1621) as fuel.
- Methanol Institute – Methanol Safe Handling and Safe Berthing, Technical Bulletin.
- SIS-CWA 17540:2020 Ships and marine technology – specification for bunkering of methanol fuelled vessels.
- Lloyd’s Register Provisional Rules for the Classification of Methanol Fuelled Ships, January 2016.
- ATEX 2014/34/EU.
- Port Bye-laws.
- General harbour regulations for the Port of Gothenburg.
- Operating regulations for the Gothenburg Energy port.

Methanol as a cargo product is covered under Annex II of the MARPOL Convention. As a marine fuel it falls within the definition of the term ‘fuel oil’ as given in regulation 2 of Annex VI to the MARPOL Convention and hence the relevant requirements of regulation 18 of that Annex are applicable – see Annex 3.

2.3 HAZARDOUS, SAFETY AND SECURITY ZONES

Hazardous area classification is compulsory for the bunkering station according to SRVFS 2004:7 and its standard IEC 60079-10 and IEC 60092-502.

Additional to the hazardous areas a safety zone must be established around the bunkering station prior to all methanol bunkering operations. The safety zone is an area around the methanol bunkering station/facilities to control ignition sources and ensure that only qualified personnel and activities are allowed in the area that could be exposed to flammable gas in case of accidental release of or other incident involving methanol during bunkering. Prior to determination of a specific safety zone at a terminal, vapour dispersion data should be calculated for the largest credible leak, based on a risk assessment. The safety zone should never be smaller than the hazardous area distances stated for the receiving vessel, bunker vessel, terminal facility or truck.

The vertical safety zone is usually 25 metres above or below the stated hazardous area.

A security zone or no movement zone must be defined and established around the methanol bunkering area to monitor and control external activities e.g. ship movements or vehicles that can lead to incidents that threaten the operation. The security zone may result in limit access for personnel and/or public. The security zone should never be smaller than the safety zone. Prior to when the operation starts the security zone has to be communicated to all parties it may concern such as adjacent terminals, other vessels and the Port Authority.



2.4 SAFETY ZONE WHILE MOORED DURING METHANOL SHIP TO SHIP BUNKERING OPERATION

The safety zone is set to a minimum of 25 metres around the bunker station onboard the receiving vessel and onboard the bunker vessel. Methanol bunkering must immediately be stopped if something interfering with the safety zone if not stated in the SIMOPS procedures. All terminal lighting and cables that interfere with the safety zone of the methanol receiving vessel shall be switched off in a way that the lights are totally powerless without any power supply. This is not applicable if the equipment is EX-proof.

Equipment such as ro-ro ramps, gangways, hydraulic/pneumatic tools/equipment which could cause sparks/heat during movement or malfunction are not allowed to be used inside the safety zone.

Persons in the close vicinity of the vessel not involved in the bunker operation shall be informed when methanol transfer operations are in progress, by means of warning signs (no smoking, no open lights etc.) When carrying passengers limitation of access to weather decks on the side where the methanol transfer is being carried out is required.

2.4.1 Security zone

The security zone is at minimum 25 metres in all directions from the vessel and should be extended when applicable. The security zone should be monitored by the vessel, other movements in the port basin by Port Authority.

If an emergency arises in the terminal, not affecting the vessel's operation, the terminal will inform the receiving vessel and/or the bunker vessel over VHF radio or other agreed communication method. If an emergency situation arises in the terminal affecting the receiving vessel and/or the bunker vessel any decision to abandon vessels or leave berth is the master's or harbour master's responsibility.

2.5 WEATHER CONDITION REQUIREMENTS

No ship to ship bunkering is allowed in Port of Gothenburg when wind force (mean wind) exceeds 20 m/s. Current wind speed can be obtained from VTS Gothenburg on VHF channel 13.

2.6 DOUBLE BANKING

Double banking of a methanol bunker vessels alongside the receiving vessel is not allowed.

3. Bunkering procedures and requirements

3.1 PROCEDURES MANUAL

A methanol bunkering procedures manual shall be provided, which at least:

- Lists personnel currently qualified to conduct methanol bunkering operations.
- Describes duties of all personal involved.
- Describes bunkering parameters for which the bunkering system has been designed.
- Lists of any limitations on bunkering operations which were identified in the risk assessment or imposed by authorities.
- Contains emergency contact information.

The manual may be incorporated into existing manual (e.g. ISM) as long as the manual is readily accessible to all involved personnel at each transfer site.

3.2 SIMULTANEUS OPERATIONS DURING METHANOL BUNKERING

Cargo handling activities can not interfere with the hazardous zone surrounding the bunker station. Cargo handling by receiving vessel during methanol bunkering can be accepted if cargo handling during methanol bunker operations are described in the ships and terminal bunker procedures for SIMOPS and is kept outside of the safety zone for all vessels with exemption for tanker vessels. For tanker vessels in the Energy Port cargo handling can also be accepted with in the safety zone if described in the ships bunker procedure for SIMOPS. No other activity to be allowed within the safety zone 25 metres surrounding the bunker station. However other simultaneous operations such as, bunkering of other fuels, delivery of stores can be accepted if handled outside of the safety zone if these activities are described and risk analysed in the ships bunker procedures for SIMOPS.

3.3 METHANOL BUNKER OPERATIONS

Shall be conducted in accordance with the fuel handling manual and emergency procedures as specified in receiving vessel SMS and by port and local regulations and safety checklists.

The bunker supplier is responsible for informing the receiving vessel regarding local regulations, and for obtaining whatever local authority approval might be required for methanol bunkering.



3.4 METHANOL BUNKER SAFETY CHECKLIST

At the Port of Gothenburg, a dedicated Methanol Bunker Safety Checklist is used to secure the methanol bunkering operation in a step by step process. The ship-specific methanol Bunker Safety Checklist should be filled in such way that all risks of the receiving vessel's cargo handling including passenger handling have been considered and determined.

Within 24 hours before commencing the bunkering operation a pre-arrival part A, B checklist shall be completed.

3.5 PRE-TRANSFER MEETING

Prior to any ship to ship or shore to ship bunker operations, a pre-transfer meeting is to be held between operation supervisors onboard the Bunker vessel/Truck/Terminal and receiving vessel before start of operation. Immediately before commencement of a bunkering operation a meeting attended by bunker operation supervisors and hose/manifold watch representatives shall be held. The pre-transfer meeting shall cover the information stated in Methanol Bunker Safety Checklist part B, Bunker and cargo operations plan, D and E.

4. Distribution of responsibility

4.1 VESSELS

Responsibility for the safe conduct of operations while a ship is receiving bunker by bunker vessel is shared responsibility between the master of the receiving vessel and the bunker vessel. All parties remain for immediately shutting down the operation in order to prevent incidents and accidents irrespective of the cause of any arising problem.

The master of the receiving vessel is responsible for all operations controlled and supervised from the vessel, the master of the bunker vessel is responsible for all operations controlled and supervised from the bunker vessel.

4.2 TANKER TRUCKS

The tanker truck driver is responsible for all operations controlled from the tanker truck. The tanker truck driver shall monitor the entire bunkering process, from start to finish. Bunkering may not under any circumstances whatsoever be left unattended.

A separate Truck to Ship checklist must be filled in.

4.3 SHORE TO SHIP FACILITY

The person in charge (PIC) of the Shore to Ship Facility is responsible for all operations controlled from the facility. The PIC shall monitor the entire bunkering process at the shore facility as well as the jetty facility, from start to finish. Bunkering may not under any circumstances whatsoever be left unattended.

A separate Shore to Ship checklist must be filled in.

5. Transfer equipment requirements

5.1 TRANSFER EQUIPMENT

All components in the methanol transfer system shall be fabricated to meet or exceed requirements as specified in the IBC code chapter 5. Transfer equipment shall be supplied and maintained by the methanol supplier unless otherwise agreed upon. The maximum pressure and pump rate during bunkering is based on the capacity of the bunker vessel and the receiving vessel's receiving capacity for safe operation.

5.2 BUNKER HOSES

Bunker hoses carried on board are to be suitable for methyl/ethyl alcohol.

Before being placed in service, each new length of bunker hose produced should be hydrostatically tested at ambient temperature to a pressure not less than 1.5 times its specified maximum working pressure, but not more than two fifths of its bursting pressure. The hose should be stencilled, or otherwise marked, with the date of testing, its specified maximum working pressure and, if used in services other than ambient temperature services, its maximum and minimum service temperature, as applicable. The specified maximum working pressure should not be less than 1 MPa gauge.

5.3 SAFETY DRY BREAK AWAY COUPLING

A recommendation is to use a methanol transfer system/hose with a safety dry break away coupling (SBC).

5.4 EMERGENCY SHUT DOWN SYSTEM

The methanol transfer system should be connected to an emergency shut down system ESD. The delivering facility and the receiving vessel ESD system shall be interconnected with a ship/shore or a ship/ship ESD link to ensure the coordinated operation of both the delivering and the receiving ESD system.

5.4.1 ESD design recommendation

The ESD may be designed to be activated by operator-initiated signal as well as sensor input. The ESD may stop the methanol transfer pumps and close the ESD valves. As a minimum the ESD may be activated upon input In the event of:

- Fire or leakage detection (leakage in liquid form or as vapour).
- Overfillage of the receiving methanol tank (high high alarm).
- Transfer arm/hose being overstressed/break away.
- Or any other identified situations and alarms that can endanger the bunkering operation.



5.5 INSULATION AND RISK FOR ELECTRIC POTENTIAL DIFFERENCE

To reduce risk of high energy spark between the bunker vessel and receiving vessel due to hulls' electrical potential difference, electrical insulation between ships shall be maintained at any stage of low flashpoint fuel transfer. Each transfer connection including connection between the bunker vessel and receiving vessel shall have insulation flange. It should be noted that ship to ship electric currents is separate from static electricity as per 5.6.

5.6 STATIC ELECTRICITY

Static electricity presents a fire and hazards risk during the handling of low flashpoint products and during other operations such as tank cleaning, dipping, ullaging and sampling. Certain operations can give rise to accumulations of electric charge that may be released in electrostatic discharges with enough energy to ignite flammable hydrocarbon gas/air mixtures. There is no risk of ignition unless a flammable mixture is present. The principles of electrostatic hazards and the precautions to be taken to manage the risks are described in the following guidelines. ISGOTT (sixth edition) and IEC TS 60079-32 Explosive atmospheres, part 32-1: Electrostatic Hazards.

6. Personal protective equipment, hazards and fire protection

6.1 PERSONAL PROTECTIVE EQUIPMENT

PPE shall be used by all persons directly involved in the operation and by staff with other duties in the proximity of the bunker transfer system.

- Hard hat.
- Eye protection.
- Antistatic safety shoes.
- Gloves in a material resistant to alcohols.
- Boiler suite or similar in a flame retardant and non-static electricity accumulating material.
- Ex classed portable gas detector. LEL, O₂.
Methanol detection equipment available onboard in case of spill etc. , (exposure limit for personnel of 200 ppm).
- EEED mask in close vicinity in case of spill for evacuation.
- Breathing apparatus for handling spill on deck with chemical protection suit.
- Eye and safety shower in close vicinity.

6.2 SPECIAL HAZARDS ARISING FROM THE SUBSTANCE

The substance is a flammable liquid that burns with a non-luminous, bluish flame. Vapours may form explosive mixtures with air. Explosive limits in air are about 6–36 %. Flash point is about 12°C. Methanol is toxic to humans and Methanol is absorbed by ingestion, inhalation, or dermal exposure, and the toxicity is the same regardless of the route of exposure.

Methanol poisoning has a number of symptoms. These include bizarre behavior, extreme dizziness, severe headaches, and coma. Methanol poisoning can cause permanent damage to the optic nerve and central and peripheral nervous system with just a single acute exposure.

The digestive system starts to immediately reject methanol and symptoms may include severe stomach pain, nausea, and diarrhea. Methanol also disrupts liver and pancreatic function. Even with treatment, methanol poisoning can cause permanent liver damage. Signs of systemic poisoning may be delayed 8–36 hours.



6.3 PERSONAL PRECAUTIONS AND EMERGENCY PROCEDURES

Keep unprotected persons away. Keep people away from and upwind of spill/leak. ELIMINATE all ignition sources (no smoking, flares, sparks or flames in immediate area). Do not touch or walk through spilled material. Wear full protective clothing and self-contained breathing apparatus when contaminating the spill.

Personnel with assigned duties related to bunkering operations shall also be trained on the following.

- Receive appropriate familiarisation and training in regard to relevant equipment procedures and operational arrangements with special attention to emergency duties.
- In actions to be taken during dangerous situations.

7. Fire fighting equipment

Methanol is totally miscible in water and retains its flammability even at very high concentrations of water. A 75% water and 25% methanol solution is considered to be a flammable liquid. This has important consequences for firefighting. Methanol is a chemical solvent, which has important implications for materials selection and also firefighting.

7.1 FIXED FIRE-EXTINGUISHING SYSTEM

The bunker station onboard the receiving vessel and bunker vessel should have a fixed fire-extinguishing system of alcohol resistant foam type and a portable dry chemical powder extinguisher or an equivalent extinguisher, located near the bunkering station.

7.2 FIRE HOSE READY FOR USE

A fire hose should be connected and available for immediate use if not a fixed water spray system is available near the bunker station.

7.2 FIXED FIRE DETECTION AND FIRE ALARM

A fixed fire detection and fire alarm system complying with Fire Safety System Code should be provided for all compartments containing the methyl/ethyl alcohol fuel system. Suitable detectors should be selected based on the fire characteristics of the fuel. Smoke detectors should be used in combination with detectors which can more effectively detect methyl/ethyl alcohol fires.

