

CHAPTER 23

Tanker and Terminal Precautions for Cargo Operations

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This chapter provides guidance on the safety precautions for tankers and terminals while a tanker is alongside for cargo handling, ballasting, bunkering, tank cleaning, gas freeing and purging operations. The main concern is to eliminate the risk to personnel, equipment and facilities from fires, explosions and health hazards, and of any environmental impact.

23.1 External openings in superstructures

Tanker accommodation and machinery spaces contain equipment that is not suitable for use in flammable atmospheres, so it is important to keep hydrocarbon gas out of these spaces.

All external doors, ports and similar openings should be closed when the tanker, or a tanker at an adjacent berth, is doing any of the following:

- Handling volatile petroleum or non-volatile petroleum that is near or above its flashpoint.
- Loading non-volatile petroleum into tanks containing hydrocarbon vapour.

- COW.
- Ballasting, purging, gas freeing or tank washing after discharging volatile petroleum.

A screen door is not a safe substitute for an external door. Additional doors and ports may have to be closed in special circumstances or because of the structural peculiarities of the tanker.

If external doors have to be opened for access, they should be closed immediately afterwards. Where practical, working access in port should be via a single door. Doors to be kept closed should be clearly marked.

Doors should not normally be locked in port. However, if there are security concerns, the measures to prevent unauthorised access should also ensure that personnel have an escape route. These measures should be agreed by responsible parties from the tanker and terminal, including, where required, Port Facility Security Officer (PFSO) and Ship Security Officer (SSO) and the tanker Master.

23.2 Central air conditioning and ventilation systems

The accommodation should be kept under positive pressure to prevent the entry of hydrocarbon vapours. Bear in mind:

- Intakes for air conditioning units are usually located in a safe area and will not draw in vapours under normal conditions.
- A positive pressure will be maintained only if the air conditioning system is operating with its air intakes open and if all access doors are kept closed except for brief entry or exit.
- The system should not be operated with the intakes fully closed, in 100% recirculation mode, as the extraction fans in galley, sanitary spaces and any other relevant spaces (e.g. smoking rooms, laundry facilities, etc.) will reduce the atmospheric pressure in the accommodation to less than the ambient pressure outside.

A gas detection and/or alarm system fitted to the air conditioning intakes will warn if hydrocarbon vapours are present. In this case, the ventilation system should be shut down and cargo transfer suspended until the surrounding atmosphere is free of the vapours.

The same principles of positive pressure and gas detection apply to tankers that have alternative air conditioning systems or additional units.

External air conditioning units, e.g. window or split air conditioning types, should not be operated during any of the operations listed in section 23.1 unless they are in safe areas or certified as safe for use in the presence of flammable vapours.

23.3 Openings in cargo tanks

23.3.1 Cargo tank lids

All cargo tank lids should be closed and secured at all times when handling volatile petroleum, loading non-volatile petroleum into tanks containing hydrocarbon vapour and ballasting after discharging volatile cargo.

Cargo tank lids or coamings should be clearly marked with the number and location of the tank they serve (port, centre or starboard).

Tank openings of cargo tanks that are not gas free should be kept closed, unless gas freeing operations are being conducted alongside by prior agreement.

23.3.2 Sighting, ullage ports and segregated ballast tank lids

During any of the cargo and ballast handling operations in section 23.1, sighting and ullage ports should be kept closed unless they need to be open for measuring and sampling, or when agreed between the tanker and terminal. If they are opened, the tank pressure should be reduced to the minimum positive pressure and access should be for the shortest time possible to complete the task while taking precautions against possible exposure to hydrocarbons and toxic vapours.

If the system design means sighting or ullage ports are to be opened for venting, the openings should be protected by a flame screen. This may be removed for a short time during ullaging, sighting, sounding and sampling. Any screen should be a good fit, kept clean and in good condition.

Segregated ballast tank lids may be opened before ballast is discharged so that the surface of the ballast can be inspected for contamination. Segregated ballast tank lids should be kept closed when cargo or ballast is being handled because petroleum gas could be drawn into them.

Segregated ballast tank lids should be clearly marked to indicate the tank they serve.

23.3.3 Cargo tank vent outlets

The cargo tank venting system should be set for the operation concerned. High velocity vents should be set in the position to ensure the high exit velocity of vented gas.

When volatile cargo is being loaded into tanks connected to a venting system that also serves tanks that are to be loaded with non-volatile cargo, to prevent flammable gas entering the tanks receiving non-volatile cargo pay close attention to the setting of Pressure/Vacuum (P/V) valves and the associated venting system, including any IG system.

Whenever tanks are isolated to prevent vapour cross-contamination, remember it is possible that pressure variations during the passage could allow oxygen to enter the tank. The inert condition may need to be restored before discharge.

23.3.4 Tank washing openings

During tank cleaning or gas freeing, tank washing cover plates should be removed from only the tanks involved and be replaced immediately when the work is completed. Any openings in the deck should be covered by gratings.

23.4 Inspecting a tanker's cargo tanks before loading



If tank entry is necessary for cargo tank inspections, comply with the requirements in chapter 10.

The inherent risk to personnel means that any tank inspection before loading should be done without entering tanks. This may be achieved through various remote means such as dipping and measuring for heel in the tank, or opening small stripping or educator lines to listen for liquid suction. It may also be possible to sight the tank bottom from a tank lid, ullage port or tank cleaning opening using a powerful torch, although the effectiveness of this method may be impaired due to vapour or haze in the tank atmosphere.

Care should be taken, when using any opening in the tank to sight the bottom, to ensure that the person undertaking the task does not inhale cargo vapours and that any opening is closed immediately after use.

Tanks should be entered for inspection only if absolutely necessary, e.g. the cargo to be loaded has a critical specification and the inspector has no alternative. In these cases only those tanks specifically requiring entry should be entered and the guidance contained in chapter 10 should be followed.

23.5 Marine cargo inspectors

Tankers often use marine cargo inspectors, or expeditors/superintendents, to assess the cleanliness of tanks, measure and sample loaded cargo, and issue official documentation such as certificates of quantity and quality on behalf of the charterer, shipper or receiver.

They need to board the tanker at different times during the cargo operation and so need access to working areas of the tank deck and other potentially dangerous spaces, such as cargo tanks and pumprooms.

No matter how familiar cargo inspectors may appear with the terminal or tanker, they should be given a safety induction when arriving at the terminal and when boarding the tanker.

Marine cargo inspectors should be escorted while conducting activities on the tanker. Best practice requires them to complete initial and periodic refresher safety training. Do not assume that the routine presence of a cargo inspector at each port means that they are all trained to the same level of health and safety awareness. The following factors should be taken into consideration.

23.5.1 Independent cargo inspection companies

Cargo inspectors are often appointed to tankers under agreed contracts whose terms and conditions are likely to be unfamiliar to the tanker Master and crew.

It is recommended that cargo inspection companies operate under health and safety policies that specifically govern the safe conduct of their employees while working at terminals and on tankers.

Ideally, the cargo inspection company should be affiliated to recognised industry bodies that operate under a code of practice, e.g. the Testing, Inspection and Certification (TIC) Council, or quality assurance standards, e.g. the International Organization for Standardization (ISO), that include expectations for health and safety performance.

23.5.2 Cargo inspection training and accreditation

Tankers visiting terminals that have appointed cargo inspectors rarely have the opportunity to assess the inspectors' competence and experience before they board the tanker. For this reason, contract owners should verify that all cargo inspectors have been through an industry recognised petroleum inspector certification programme. This programme should ensure the inspector is familiar with not only petroleum inspection guidelines but also:

- Specific health and safety requirements of the terminal and tanker in addition to those of the national, regional or international regulatory bodies that operate at the location.
- Safety recommendations in this publication.
- Has been trained in:
 - Hazard awareness and reporting, including Stop Work Authorities (SWAs).
 - Confined spaces awareness, including tank entry procedures, permits to work and Safety Management Systems (SMSs).
 - Safe working practices in flammable and hazardous environments.
 - Static electricity awareness and precautions.

- Personal Protective Equipment (PPE), including respiratory and other safety apparatus for the specific working environment.
- SDSs.
- Safe handling and transportation of samples.
- Drug/alcohol abuse awareness.

The cargo inspector should also be re-evaluated via periodic audits and recertification, where applicable.

23.5.3 Safe working in terminals and on tankers

23.5.3.1 Duty of care

The safety and welfare of cargo inspectors is, primarily, the responsibility of the cargo inspection company. This responsibility extends to the operator of the site or tanker Master when inspectors are carrying out their duties.

To meet this duty of care, the terminal operator should ensure that cargo inspectors are familiar with the facility and its arrangements for safe movement and working, have had the necessary site safety induction and are authorised to move around the facility. As a minimum, cargo inspectors should report in and out with facility staff at each operating area and it is recommended that they are escorted at all times by facility staff during field operations.

Every tanker has different arrangements and cargo activities that inspectors may not be fully familiar with. When boarding, they should be escorted immediately to the officer in charge of deck operations to undertake a tanker specific safety induction briefing.

23.5.3.2 Safe working on tankers

When working on tankers, inspectors should be accompanied at all times by a responsible crew member and should not operate the tanker's equipment, including tank lids and tank valves.

When measuring and sampling via a vapour lock, coordinated action is needed to deploy the measuring and sampling equipment. A crew member should always stay with the inspector to help with the work and ensure the valve is operated correctly. At the end of the operation, the crew member is also responsible for ensuring the valve is closed securely.

Safe access and movement around tankers and terminals is covered by national and international regulations and by safe working practice standards and guidelines (see section 16.4). Cargo inspectors should comply with these requirements when carrying out their duties, and when boarding and moving around the tanker working areas, so that they do not expose themselves to risks.

Access around deck in general, and sampling and measuring points in particular, can be difficult on ships with above deck transverse stiffeners. In some cases, this will result in having to climb over the stiffeners and cargo pipelines or crawl through lightening holes and under pipelines to facilitate access. These activities can be arduous and unsafe, particularly in wet or inclement weather. Access to and egress from these areas in an emergency could also be challenging.

The minimum lighting requirements during darkness are clearly defined and all personnel, including cargo inspectors, should ensure that they do not enter into areas with inadequate lighting. Further guidance on lighting is in section 17.3.

23.5.3.3 Stop Work Authority

While at a terminal or on a tanker, cargo inspectors should comply with all site safety requirements. If a situation develops that is considered unsafe, they are responsible for their own immediate safety and should alert the responsible people for the terminal or tanker under an SWA (see section 4.3).

If work is stopped, it should not resume until the situation has been fully resolved or an alternate safe solution, with appropriate mitigation, is agreed and implemented.

23.6 Tanker and terminal cargo connections

23.6.1 Flange connections

Terminal cargo connections to tanker manifolds should be in line with OCIMF/CDI's *Recommendations for Oil and Chemical Tanker Manifolds and Associated Equipment*.

The tanker and terminal are jointly responsible for ensuring that presentation flange faces are clean and in good condition. The provider of the transfer equipment (MLAs or hoses) should be responsible for providing new appropriate gaskets before each connection.

Where bolted connections are used they have to be fully secured with all available bolts. Care should be taken as uneven or over-tightened bolts could cause leaks or fractures. Improvised arrangements, with G-clamps or similar devices, should not be used for flange connections.

Where Quick Connect/Disconnect Couplings (QC/DCs) are used to make the flange connection, these can be either automatic (hydraulically actuated) or manual using a camlock-type arrangement. In either case, the terminal and tanker should exchange details of the connection system to ensure the:

- Tanker manifold flange is compatible with the proposed QC/DC system connection.
- System integrity is on the same level as a fully bolted connection.
- Tanker or terminal personnel responsible for the connection and disconnection are clearly defined.

As with all marine terminal equipment, the manufacturer's guidance on installing, operating, inspecting and maintaining the QC/DC coupling should be followed. Documentation should be made available if requested by the tanker.

23.6.2 Removing blank flanges

Each tanker and terminal manifold flange should have a removable blank flange made of steel or other approved material, preferably fitted with handles.

Before removing blanks from tanker and terminal pipelines, MLAs or hoses, ensure that the section between the last valve and blank is drained, depressurised and that appropriate spill protection is in place.

Blank flanges should be capable of withstanding the working pressure of the line or system they are connected to. They should also be as thick as the end flange they are fitted to.

23.6.3 Reducers and spool pieces

Reducers and spools should be made of steel and be fitted with flanges that conform to the American Society of Mechanical Engineers (ASME) Standard B16.5, Class 150 or equivalent (see OCIMF/CDI's *Recommendations for Oil and Chemical Tanker Manifolds and Associated Equipment*).

To ensure compatibility between tanker and terminal, the material of manifold reducers or spool pieces should be confirmed before the tanker arrives, as part of the pre-arrival exchange of information (see section 21.2) and TIB (section 15.2.2).

Manifold pressure gauges should be fitted on the outboard side of the manifold valve to the spool piece or reducer.

All spool pieces and reducers should have lifting lugs fitted close to the centre of balance so that they can be handled more easily. The handles should not interfere with quick acting coupling devices or the bolting of flanges. When in storage, flange faces should be suitably protected.

23.7 Spills and leaks

23.7.1 General

The cargo transfer system should be checked at the start of cargo transfer and at agreed intervals. This should include tanker outboard manifolds, pipelines, MLAs, cargo hoses, unused connections, blanks, valves and waterside checks. At any sign of a leak, cargo transfer should be stopped immediately and resumed only when the situation has been corrected.

The ullages of cargo or bunker tanks that have been topped up should be checked from time to time during the remaining loading operations to ensure that leaking valves or incorrect operations do not cause overflows.

On double hull tankers, take care not to reduce the Transverse Metacentric Height (GM), which can induce an angle of list or loll when de-ballasting double bottom tanks after some cargo tanks have been topped-off. This could also cause an overflow (see section 12.1.6).

If any released oil or petroleum gas looks like it could enter an engine room or accommodation space intake, take immediate preventive measures. Equipment should be ready to promptly remove any spill on deck. Any oil spill should be reported to the terminal and port authorities. The relevant shore and shipboard oil pollution emergency plans should be activated.

If a tanker has an alternative fuel system that involves the control of gas vapour pressure, the control mechanism should be fully operational to ensure there is no release (see section 12.11).

Harbour authorities, and any nearby ship or shore installations, should be warned of any potential hazard caused by a spill or release.

23.7.2 Checks on quantity during cargo handling

At the pre-transfer conference, the tanker and terminal representatives should agree to regularly check:

- Pressures in the pipeline and cargo transfer system (hose or MLAs).
- Quantity of cargo to be loaded or discharged between the tanker and terminal.
- Tanker calculations for quantities, considering trim and heel corrections.

An unexpected change in pressures, or a marked discrepancy between the tanker and terminal calculations of quantities transferred, could indicate pipeline or hose leaks or blocks, particularly in submarine or long trestle pipelines.

Stop the cargo transfer until the reason for any differences have been identified. The transfer should resume only with the agreement of all parties.

23.7.3 Sea and overboard discharge valves

During cargo, tank cleaning/de-ballasting operations, keep a watch to ensure that no oil is escaping through sea valves.

Sea and overboard discharge valves connected to the cargo and ballast systems should be closed and secured using a Lock-out/Tag-out system (LO/TO), and may be sealed when not in use. In-line blanks should be inserted where provided. When a LO/TO system is not practical as with hydraulic valves, use some suitable marking to indicate clearly that the valves are to remain closed.

More information on this subject is in OCIMF/ICS' *Prevention of Oil Spillages through Cargo Pumproom Sea Valves*.

23.7.4 Scupper plugs

Before cargo handling starts, all deck scuppers and any open drains on the jetty should be effectively plugged to prevent spilled oil escaping into the water around the tanker or terminal. Accumulations of water should be visually checked for oil sheen and periodically drained through absorbent material. The effectiveness of scupper plugs needs to be ensured and they should be replaced immediately after the water has been run off.

Oily water should be transferred to a slop tank or other suitable container. If necessary, the tank pressure should be reduced to help draining.

23.7.5 Spill containment

A permanently fitted spill tank, with suitable means of draining, should be fitted under all tanker/terminal manifold connections. If no permanent spill tank is fitted, portable drip trays should be placed under each connection to catch any leaks. Avoid plastic and other non-metallic containers unless bonding is possible.

23.7.6 Tanker and terminal cargo and bunker pipelines not in use

Valve tightness should not be relied on to stop the escape or seepage of oil. All terminal pipelines, MLAs and hoses not in use at a berth should be securely blanked.

All the tanker's cargo and bunker pipelines not in use should be securely blanked at the manifold. Where fitted, cargo pipelines to stern or bow manifolds should be drained of cargo and isolated from the tanker's main pipeline system. For stern manifolds this will require physical blanking or removal of a spool piece to fully isolate the line forward of the accommodation.

23.7.7 Loading at terminals with Vapour Emission Control Systems

23.7.7.1 General

When tankers are loading at a terminal, the vapours are displaced by the incoming cargo and are then transferred ashore by pipeline for treatment or disposal. However, the operational and safety implications are significant because the tanker and terminal are connected by a common stream of vapours that introduce several additional hazards that have to be controlled.

Detailed guidance on technical issues associated with vapour emission control and treatment systems is available from a number of sources. The IMO has developed international standards for the design, construction and operation of vapour collection systems on tankers and VECSs at terminals. OCIMF has issued guidance on vapour manifold arrangements (see bibliography).

Note that VECSs can serve tankers fitted with IG systems as well as non-inerted tankers.

A summary of the terminal's VECS should be included in the TIB.

23.7.7.2 Misconnection of liquid and vapour lines

To prevent the possible misconnection of the vapour manifold to a liquid loading line, a mechanical keying arrangement should be provided for vapour manifold presentation flanges as follows:

1. The bolt locations should be arranged so that two bolts straddle the 12 o'clock position at the top of the flange face.
2. One cylindrical stud should be permanently attached to each of the presentation flange faces at the 12 o'clock position on the flange bolt circles. This cylindrical stud should project horizontally outboard, perpendicular to the flange face and centred on the same bolt circle, as defined in ASME B16.5. The diameter of the cylindrical stud should be 12.7mm and it should be at least 25.4mm long.

Full details of vapour manifold arrangements, materials and fittings are in OCIMF/CDI's *Recommendations for Oil Tanker Manifolds and Associated Equipment*.

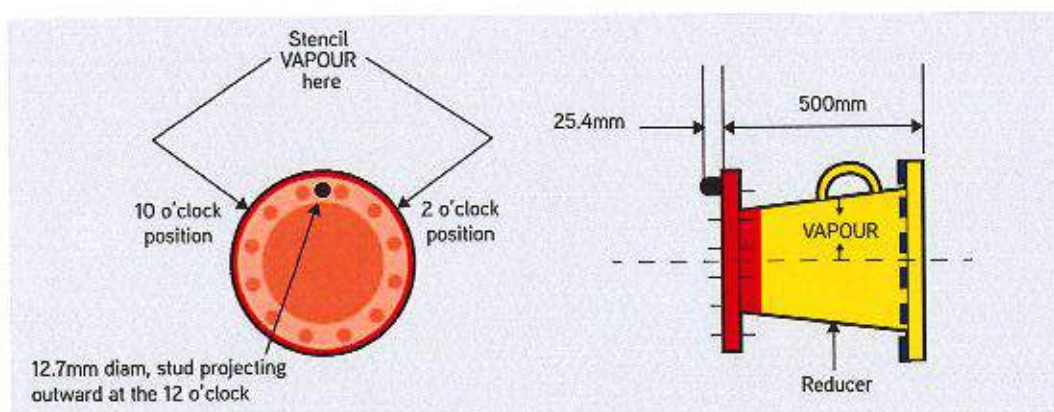


Figure 23.1: Vapour manifold flanges, orientation and labelling

23.7.7.3 Vapour over/under pressure

Although all closed cargo operations require in-tank pressures to be monitored and controlled, the connection to a VECS means that any changes in the terminal's system will directly influence pressures within the tanker's vapour spaces. It is important to ensure that the individual cargo tank P/V protection devices are fully operational and that loading rates do not exceed the maximum allowable rates. Pressures within vapour collection piping systems should be continuously monitored by sensors with high and low pressure alarm functions, connected to audible and visual alarms.

23.7.7.4 Cargo tank overflow

The risk of overfilling a cargo tank when using a VECS is no different from that when loading under normal closed conditions (see section 12.1.6.6).

23.7.7.5 Sampling and gauging

A cargo tank should never be opened to the atmosphere for gauging or sampling while the tanker is connected to the terminal vapour recovery system unless loading to the tank is stopped. The tank should also be isolated from any other tank being loaded and precautions taken to reduce any pressure within the cargo tank vapour space.

On non-inerted tankers, the precautions against static hazards should also be followed (see section 12.8).

23.7.7.6 Fire/explosion/detonation

Connecting the tanker and terminal vapour streams, which may be within the flammable range, introduces significant hazards that are not normally present when loading. Unless adequate protective devices are installed and operational procedures are followed, a fire or explosion in the vapour space of a tanker's cargo tank could transfer rapidly to the terminal and vice versa.

A detonation arrester should be fitted in close proximity to the terminal vapour connection at the jetty head to provide primary protection against a flame spreading from tanker to terminal or terminal to tanker.

The design of the terminal vapour collection and treatment system will determine whether flammable vapours can be safely handled. If they cannot, the system will be able to either inert, enrich or dilute the vapour stream and continuously monitor its composition.

23.7.7.7 Liquid condensate in the vapour line

The vapour line should be fitted with a system to effectively drain and collect any liquid condensate that accumulates in the lines. Any build-up of liquid in the vapour line could impede vapours, which would increase in-line pressures and generate significant electrostatic charges on the surface of the liquid. Drains should be installed at the low points in the vapour piping system and they should be routinely checked to ensure that no liquid is present.

23.7.7.8 Electrostatic discharge

The precautions for initial loading rates in section 12.1.7.3 and for measuring and sampling procedures in section 12.8 should be followed. To prevent the build-up of electrostatic charges within the vapour collection system, all pipework should be electrically bonded to the hull and be electrically continuous. The condition of the bonding arrangements should be inspected regularly. The terminal vapour connections should be electrically insulated from the tanker vapour connection by an insulating flange or a single section of insulating hose.

23.7.7.9 Training

The tanker and terminal personnel involved in the VECS operation should be instructed on the aspects of the system that affect safety at the tanker/terminal interface.

23.7.7.10 Communications

Using a VECS highlights the need for cooperation and communication between the tanker and the terminal. Pre-transfer discussions should provide the tanker and the terminal with a good understanding of each other's operating parameters. Details such as maximum transfer rates, maximum allowable pressure drops in the vapour collection system and alarm and shutdown procedures should be agreed before operations start (see sections 21.4 and 25.4.3).

23.8 Firefighting while the ship is alongside a terminal

When a tanker is alongside a berth, firefighting equipment on the tanker and terminal is to be ready for immediate use.

On board the ship, this is normally achieved by having fire hoses with jet/spray nozzles connected and run out forward and aft of, and adjacent to, the manifold that is in use. In addition, where fire monitors/cannons are fitted for water and/or foam, those immediately forward and aft of the manifold should also be left positioned so as to point towards the manifold area. Having a portable dry chemical powder extinguisher available near the manifold provides additional protection against flash fires.

On the jetty, firefighting equipment should also be ready for immediate use in accordance with guidance in section 19.4.

23.9 Firefighting while in proximity to other ships

23.9.1 Tankers at adjacent berths

Flammable concentrations of petroleum gas may be encountered if another tanker at an adjacent berth is handling cargo or ballast, purging, tank cleaning or gas freeing. In this case, follow the precautions described in section 23.1.

23.9.2 General cargo ships at adjacent berths

General cargo ships are unlikely to comply as fully as tankers with the safety requirements for possible sources of ignition, e.g. smoking, naked lights, cooking and electrical equipment.

When a general cargo ship is at a berth near a tanker that is loading or discharging volatile petroleum, loading non-volatile petroleum into tanks containing hydrocarbon vapour, ballasting tanks containing hydrocarbon vapour, or purging or gas freeing after discharging volatile petroleum, the terminal should evaluate all safety hazards and take precautions additional to those in this chapter, such as those for Simultaneous Operations (SIMOPS).

Such precautions should include a safety briefing with the responsible representatives on the general cargo ship, clearly defining the hazards of the cargoes handled by the tanker and the precautions to be taken on the cargo ship. This is particularly relevant where the ship may have passengers who are less familiar with general ship safety and may be moving around the general cargo berth areas.

23.9.3 Tanker operations at general cargo berths

When tanker operations are conducted at general cargo berths, it is unlikely that personnel on the berths will be familiar with the safety requirements for possible sources of ignition or that cranes or other equipment will comply with the design and installation parameters for electrical equipment in hazardous areas.

As in section 23.9.2, the terminal should take precautions additional to those set out in this chapter. These precautions should include:

- Enhanced security arrangements.
- Restricted vehicle access.
- Removable barriers to control personnel access to the berth.
- Additional firefighting equipment and control of sources of ignition.
- Restrictions on the movement of goods and equipment.
- Lifting of loads by cranes and the coordination of activities.

23.9.4 Tugs and other craft alongside

The number of craft that come alongside under specified conditions, and the duration of their stay, should be agreed between the tanker and the terminal.



If craft are allowed alongside while the tanker is at the terminal, the number of craft and the amount of time alongside the tanker should be kept to a minimum.

Subject to any port authority regulations, only authorised craft with the permission of the Responsible Officer and, where applicable, the Terminal Representative, should be permitted to come alongside or remain alongside a tanker while it is handling volatile petroleum or is ballasting tanks containing hydrocarbon vapour. The tanker's Responsible Officer should instruct personnel manning the craft that they should observe the regulations on smoking, naked lights and cooking appliances. If there any breaches of the regulations, operations should stop immediately.

Terminals should instruct the operators of authorised craft on the use of engines and other equipment in order to avoid sources of ignition when alongside a tanker or a jetty. Where necessary, this will include providing spark arresters for engine exhausts and instructions on proper fendering. Terminals should also ask the craft to post suitable notices informing personnel of the safety precautions to be observed.

If any unauthorised craft come alongside or secure in a position that may endanger the operations, they should be reported to the port authority and the operations should stop.

Before allowing stores and provisions to be supplied to a tanker alongside a terminal during cargo transfer operations, a risk assessment should be completed for SIMOPS (see chapter 4). Additionally, only the craft stores crane (where fitted) should handle stores. The midships cargo handling crane should not be used while cargo operations are underway because of the risk of a suspended load falling onto the pressurised manifold pipelines.

23.10 Notices

23.10.1 Notices on the tanker

On arriving at a terminal, a tanker should display notices at the gangway in appropriate languages stating:



Figure 23.2: Notices on the tanker

Alternative wording containing the same warnings may be used.

Terminal personnel should observe the requirements of these notices when on the tanker.

Photo luminescent notices stating, 'Emergency Escape Route', should be displayed at appropriate locations, together with directional signs.

23.10.2 Notices on the terminal

Permanent notices and signs indicating that smoking and naked lights are prohibited should be displayed clearly on the jetty in appropriate languages. Similar permanent notices and signs should be displayed at the entrance to the terminal area or the shore approaches to the jetty.

In buildings and other shore locations where smoking is allowed, notices to this effect should be clearly displayed.

Emergency escape routes from the tanker berth to safe areas ashore should be clearly indicated.

23.11 Manning requirements

The level of manning should ensure that all operations related to the tanker/terminal interface are carried out safely. It should also ensure that emergency situations and security can be managed at all times during the tanker's stay at a terminal.

Details of manning levels on the tanker and the terminal should be discussed during the pre-transfer conference to ensure all parties involved in the tanker/terminal interface are fully aware of the availability of staff to handle operational and emergency situations. This is particularly relevant if a berth is not continually manned.

23.12 Control of vehicles and other equipment

The use of vehicles and equipment should be controlled, particularly in hazardous zones. Routes to and from work places and parking areas should be clearly indicated. Where necessary, barriers or fencing should be provided to prevent unauthorised access.

Only authorised vehicles should be allowed to enter hazardous zones next to the tanker or berth.

23.13 Helicopter operations

Helicopters are not permitted over the tank deck unless all other operations have been suspended and all cargo tank openings are closed. Helicopters should only be operated in line with ICS' *Guide to Helicopter/Ship Operations*.