

Hot Work Procedural Guidelines

November 2011



Port of Melbourne
Corporation



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Revision history

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Approval

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The most up-to-date document and central source for referenced forms and additional guidelines can be located on the Port of Melbourne website at <http://www.portofmelbourne.com>

Within the PoMC Safety and Environment Management System this document is under SEMS10 Operational Control\Hot Work Documentation and its title is

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1 Introduction

1.1 Purpose and scope

The aim of these procedures is to develop a safe work environment with respect to hot work within the port to minimise accidents that may lead to personal injury or property damage.

These procedures specify precautions to be taken before, during and after hot work, to prevent the possibility of fire or explosion, which may result in harm to persons or property within Port of Melbourne Corporation (PoMC) precinct.

These procedures apply to all port users i.e. ships' masters; leaseholders and contractors who wish to undertake hot work in the port area.

1.2 Reference documents

The following documents are referred to in this document:

- | | |
|---|---|
| AS 1674.1:1997 | Safety in Welding and Allied Processes: Fire precautions |
| AS 1674.2:2007 | Safety in Welding and Allied Processes: Electrical |
| AS 1940:2004 | Storage and Handling of flammable and combustible liquids |
| AS 2865:2009 | Safe working in confined spaces |
| AS 3846:2005 | The handling and transport of dangerous goods in port areas |
| AS/NZS ISO 31000:2009 | Risk Management – Principles and Guidelines |
| AS 61779: 2000 | Electrical apparatus for the detection and measurement of flammable gases |
| AS 4839-2001 | The safe use of portable and mobile oxy-fuel gas systems for welding, cutting, heating and allied processes |
| AS 1335-1995 | Hose and hose assemblies for welding, cutting and allied processes |
| Occupational Health and Safety Act 2004 | |
| Occupational Health & Safety Regulations 2007 | |
| International Maritime Dangerous Goods Code (IMDG) as amended | |
| International Safety Guide for Oil Tankers and Terminals (ISGOTT) | |
| Compliance code – Confined spaces 2008 | |
| The Port Management Act 1995 and the Port Management (Port of Melbourne Safety and Property) Regulations 2010 | |

1.3 Roles and responsibilities

Hot work shall be carried out under the control of a person who is responsible for the safe execution of all operations and has the authority to enforce the requirements of this procedure. This person will be herein referred to as the supervisor.

It is the responsibility of the supervisor to apply for a hot work permit. The supervisor will also notify the port officer of any changed circumstances that may affect the work permit.

The hot work must be approved by the Port Safety Officer. A port officer may audit any hot work site as deemed necessary.

Hot work shall not proceed outside the area specified on the hot work permit. Hot work shall be carried out only during the period stated on the permit.

1.4 Definitions

Hot work

Grinding, welding, thermal or oxygen cutting or heating, and other related heat-producing or spark-producing operations that may increase the risk of fire or explosion.

Competent person

A person who has, through a combination of training, education and experience, acquired knowledge and skills enabling that person to perform correctly a specified task.

Contaminant

Any dust, fume, mist, vapour, biological matter, gas or other substance in a liquid or solid form, the presence of which may be harmful to health and safety.

Shall

Indicates that a statement is mandatory.

Should

Indicates a recommendation.

2 General requirements

2.1 Identification and security

The port is a restricted area and secured against unauthorised entry. Entry into port areas is controlled by:

- Maritime Security Identification Card (MISC); and
- inductions to local berths or terminal.

Escorted entry into the port areas may be permitted by:

- a valid identification card with a photo ID (eg – driver's licence); or
- a valid passport.

Additionally, some terminals require access permission sent to the gatehouse 24 hours before entry. This may be sent via:

- the ship master or his appointed agents;
- the duty Security Officer; and
- leaseholders or the licence holders.

2.2 Inductions

Inductions are a process of familiarising staff with the hazards and safety controls on the site that they are coming to work in. The inductions may be of a general nature, site or task specific. In either case, it is the first step in the consultation process aimed at:

- familiarisation of staff with the necessary information to prevent injuries
- knowing key contacts in normal and emergency situations
- being aware of the emergency equipment and emergency procedures of the site
- understanding the requirements of the sites Quality, Health, Safety and Environmental policies and procedures.

Task and operational specific inductions are encouraged when working on specialised plant or equipment.

2.3 Consultation

In implementing the requirements of these guidelines, consultation shall take place between the stakeholders or their representatives, in accordance with the relevant provisions of the *Occupational Health & Safety Act 2004*(VIC).

The Act requires employers to consult, so far as reasonably practicable, with employees, who are, or likely to be, directly affected by the hazards that they may be exposed to.

Examples of consultation process

The consultation process may include one or more of the following:

- Tool Box Meetings
- Hot work permits or checklist
- Job Safety Analysis (JSA)
- Work method statement or procedures

Consultation means that employers must share information with employees, give them reasonable opportunity to express their views and take those views into account. Procedures for consultation that have been agreed on must be adhered to. Guidance on the minimum compliance requirements for consultation is available from WorkSafe Victoria.

2.4 Supervision and inspection

Hot work shall be carried out under the control of a person who is responsible for the safe execution of all operations and has the authority to enforce the requirements of this procedure. This person will be herein referred to as the supervisor.

The supervisor must control the following:

- compliance with the prevailing safe work practices
- work force access and security requirements
- fire prevention methods and equipment is in place (fire blanket, barriers)
- fire fighting equipment is serviceable
- emergency management procedures are in place.

Before hot work is started in any location, the supervisor shall:

- thoroughly inspect the site and adjacent areas for hazards
- ensure the hazards are identified
- have procedures or processes to manage the hazards
- ensure the equipment being used is compatible with the work undertaken
- locate the equipment so that, in the event of a malfunction a dangerous situation is not created and a safe entry/exit is maintained.

During hot work, the supervisor shall ensure:

- containment of sparks and slag
- no changes to work environment alter post safety planning
- work is not carried out in isolation
- all hazard precautions identified are taken.

On completion of hot work, the supervisor shall:

- inspect the site and the adjacent area
- ensure no smouldering material is on site
- wet down timber structures and decking's.

Note: The area must be re-checked by a responsible person 30 minutes after the completion of all work.

3 Risk management

3.1 Risk management process – Safe Wok Methods

The hazard identification and risk management process must take into account and treat:

- the work activity (practices and processes) being undertaken
- the presence of hazards (dangerous goods, hazardous substances, flammables, dust, fibres) within 25 metres of the work area
- the work environment outside the 25 metre zone
- the working limitations such as working at heights and over water
- working adjacent to a confined space or fuel tank
- the possibility of changing circumstances and environments during the progress of work
- the size and limitations of the work force
- the control measures prevailing such as isolation of systems, barricading of area
- the availability of control measures within the vicinity of the work area such as fire screens, fire blankets and fire fighting equipment

Each stage of the risk management process should be recorded and documented appropriately. Assumptions methods, data sources, analyse results and reasons for decisions should all be included..

The documented records of such processes are important and must be kept on site and accessible where the works are taking place

3.2 Hazard identification

The entire process needs to be examined to identify any hazards, for example:

- a single hazard (mooring ropes or dangerous goods in vicinity)
- multiple hazard (cargo operations in progress, working adjacent to fuel tanks)
- cumulative hazard (Fire, explosion).

Other hazards also need to be considered which may be external to the process.

These hazards include:

- working at heights
- working over water
- prevailing and changing weather conditions
- proximity of other cargoes on board the ship
- flammable and combustible material within 25 metres of the hot work
- proximity of sensitive activities and equipment on board
- hazards that may exist in the area outside or in adjacent compartments
- equipment location on site as well as equipment malfunction
- inherent hazard (a hazard that may develop from the process)
- changing circumstance that may render the area unsafe
- interaction with other activities
- prevailing work conditions such as cargo transfer, bunker transfer
- access to medical services
- safe access to and from the work area
- maintaining a safe atmosphere in the work area.

Examples of flammable and combustible material

- rags used for cleaning and wiping the area
- timber structures and decking
- grass, leaves and bushes
- ropes such as:
 - mooring ropes
 - supporting and scaffolding ropes
 - load ropes for equipment and material

Examples of changing circumstance

- smoke and fumes from the equipment being used
- consumption of oxygen from the equipment being used
- vapours entering through the ventilation system
- vapours developing from sludge and scale present
- vapours from refuelling or fuel tanks or fuel vents
- sources of leaks such as:
 - relief valves and bleeder valves operating
 - sewer traps and drain traps losing seal
 - glands and sample points

The information for identifying hazards can be obtained from internal sources such as:

- company procedures
- International Ship Management (ISM) Code.

Or external sources such as:

- Australian Standards
- Compliance codes of Practice
- Industry guidelines
- Worksafe Victoria Website or advisory line.

3.3 Risk assessment

There are various methods of carrying out a risk assessment. The purpose of the risk assessment is to determine the probability and consequences if exposed to identified hazards. The aim is to reduce risks of

- possible injury to people from the work being undertaken
- possible damage to property from the work being undertaken
- prevailing unsafe work practices
- the work force being unsupervised
- the hazard in place that need to be controlled
- the order in which the risks or work need to be controlled.

A generic assessment can be used to minimise duplication and to streamline the process. However, the supervisor or the ship's master or his appointed crew member will be held responsible to ensure that the risk assessment:

- is valid for the work being undertaken
- is reviewed and current
- has a work permit and a work method statement.

3.4 Risk control

Risk control is the process of determining and implementing appropriate measures to reduce the risk associated with the work being undertaken.

Risk controls, must be applied to high levels of risk. This should not, however, preclude attention to lesser risks that can be easily dealt with.

All risk with unacceptable consequences requires immediate action. Risk control measures must be reviewed so as to ensure that any action taken to correct one risk does not itself initiate into another risk.

The main aim is to eliminate the risk as far as is reasonably practicable. A hierarchy of controls is in place commencing with elimination when determining the most effective risk control.

Effective risk control

Eliminate the risk by:

- barricading area of operation
- stopping cargo operations in the short term
- delaying hot work operations till cargo work is completed
- working during breaks such as meal breaks

3.5 Risk control measures – Hierarchy of Control

Risk control measures have a preferred in the following priority sequence of application which are:

1. Elimination

This is the removal of the risk at the source. As work, especially hot work, must take place, complete elimination of all risks is not a likely solution, but some of the associated activities that may give rise to a risk may be eliminated.

Type of elimination

- Work after the discharge of dangerous cargo
- Work in an empty hold or cargo space

2. Substitution

Substitute the hazardous activities by less hazardous ones.

Type of substitution

- Repair and assemble in workshop instead of repairing on site
- Prefabricate and bolt on instead of welding

3. Isolation

Isolation is the separation of dangerous activities from people, property or another dangerous activity.

Type of isolation

Isolate the area by:

- Barricading area of operation
- Inserting blank flanges in the system
- Tagging out operating systems such as valves and fuses

4. Engineering controls

Engineering Controls use measures to change the physical characteristics of equipment or process to reduce the risk associated with the transfer operation. SCADA (System Control & Data Acquisition) are the most common engineering controls used in present day transfer. However, over reliance on equipment, lack of test, calibration and intermediate use has led to system failures.

Engineering controls

Engineering controls are:

- Gas monitors and alarms
- Interlocking valves and switches
- Ventilation units

5. Administrative controls

Administrative controls are systems of work that eliminate or reduce the risk. They consist of properly designed and implemented work practices and procedures used in supporting other control measures.

Administrative controls

Administrative controls are:

- Work method statements, Instructions and checklist
- Permits to work systems.
- Training and supervision
- Workplace monitoring

6. Personal Protective Equipment (PPE)

Personal protective equipment (PPE) consists of devices and clothing that provide the individual with a level of protection from the hazard. It is to be used when all other outcomes have failed. It should not be used as a sole control measure, except in cases where there are no other practicable measures.

PPE must be selected to ensure that:

- the devices are suitable for the individual
- provides the level of protection for the intended task
- complies with the Australian Standards or other recognised standards
- it is clean, functional and ready for deployment
- it is maintained by trained staff with a recognised service program
- there are clear instructions on the proper use of the equipment
- the use is enforced by the employer.

Personal Protective Equipment

Personal protective equipment is:

- Full length working apparel, safety footwear, gloves, eye glasses or face shields, hard hats
- Safety harness and fall arrest systems
- Air and gas personal monitors

3.6 Implementation of risk control

Implementation of risk control and treatment measures needs to be recorded, monitored and reviewed. They must be:

- specific for the work, task, person and hazard
- accompanied by an action plan and training in the correct use and fitment
- cost effective and
- reduce the health or safety risk.

3.7 Monitor and review

The risk management process must be recorded to monitor the effectiveness of the process and as a tool for continuous improvement. The monitoring and review process can be done at all levels of the process which must include the planning level, strategic level and the operational level.

During the monitor and review process, changing circumstances should be considered so that the priorities and the control measure are adapted to the changing circumstances.

4 Additional requirements

The risk management process should consider the following:

- confined spaces
- dangerous goods
- fire protection
- Total Fire Bans
- transfer operations – cargo and bunker
- working at heights
- working over the water
- working in trenches and open pits
- timber structures and decking
- asbestos cladding and roofing
- medical condition and fitness for work of personnel.

The port recommends that these requirements be a part of:

- a work permit
- a safe work method statement (SWMS) or
- a job safety analysis.

4.1 Confined spaces

A confined space as defined in Appendix B of *Compliance code – Confined spaces 2008 (WorkSafe Victoria)* is:

A space in any vat, tank, pit, pipe, duct, flue, oven, chimney, silo, reaction vessel, container, receptacle, underground sewer or well, or any shaft, trench or tunnel or other similar enclosed or partially enclosed structure, if the space:

- is, or is intended to be, or likely to be, entered by any person
- has a limited or restricted means for entry or exit that makes it physically difficult for a person to enter or exit the space
- is, or is intended to be, at normal atmospheric pressure while any person is in the space; and
- contains, or is intended to contain, or is likely to contain:
 - an atmosphere that has a harmful level of any contaminant
 - an atmosphere that does not have a safe oxygen level, or
 - any stored substance, except liquids, that could cause engulfment - but does not include a shaft, trench or tunnel that is a mine or is part of the workings of a mine.

Any work in a confined space shall:

- comply with the requirements of *AS 2865 (Safe work in a confined space)* and the *Compliance code – Confined spaces 2008 (WorkSafe Victoria)*.
- have a Confined Space Entry Permit" issued by a competent person
- be well ventilated and constantly monitored for minimum safe oxygen levels and Lower Explosive Limits (LEL)
- also be monitored for other airborne contaminants such as carbon monoxide and hydrogen sulphide
- be sufficiently illuminated around the work area as well as the route to the entry/exit points
- have as a minimum one stand-by person outside of, and in close proximity to the space, capable of being in continuous communication with, and to observe, those in the space
- have an ELSA (emergency life saving appliance) on hand or rescue equipment available for immediate deployment
- have a permit issued by the Duty Port Safety Officer if the work involves hot work

Atmosphere in a confined space must be tested for:

- oxygen content (must be greater than 19.5 %)
- airborne concentration of flammable contaminants (must be less than 5% LEL)

- airborne concentration of potentially harmful contaminants such as carbon monoxide and hydrogen sulphide

4.2 Dangerous goods

Means dangerous goods within the meaning of the *Dangerous Goods Act 1985 (VIC)* and as listed in chapter 3 of the *Australian Code for Transport of Dangerous Goods by Road and Rail (7th edition)*.

Hot work must NOT be conducted within 25 metres of dangerous goods. If hot work must be conducted within 25 metres of dangerous goods the following precautions apply:

- a permit must be issued by the Duty Port Safety Officer who will inspect the site prior to issuing the permit
- if dangerous goods have the capacity to generate explosive vapours the area must be continuously monitored with approved gas testing equipment
- if the work is likely to react with the dangerous goods when exposed, the use of separation barriers or screens must be employed
- all flammable and combustible material including sparks and slag must be contained and protected e.g. fire blanket over oily bilges, oily rags must be contained and disposed of in a rigid metal container
- appropriate fire extinguishing equipment must be immediately available

4.3 Fire protection

All precautions must be taken to ensure that any incendiary sparks, heated materials or hot slag do not cause any potential risk to nearby materials or dangerous goods. Fire precautions include:

- a fire watch (as prescribed in AS 1674.1) must be present to oversee works in the advent of a fire outbreak or hazard
- inspection and monitoring of adjoining compartments, if heat transfer is possible
- those conducting hot work must:
 - be able to raise the alarm
 - be able to locate the fire fighting equipment as well as proficiently use it
 - be able to control the situation till assistance arrives
- removal of combustible material such as timber, rope and debris from the vicinity of the work area
- suitable fire fighting equipment must be readily available for immediate use
- combustible material that cannot be removed should be covered with a safely secured non-flammable cover, e.g. fire blanket
- use of barriers, isolating flanges, tag out procedures as well as signposting the work area
- stop all work, secure equipment in a safe position and evacuate to the emergency muster point if:
 - the alarm sounds
 - a hazardous situation has developed

On completion of the work, inspections of the work area and the adjacent areas shall be carried out to ensure that the areas have been left in a safe condition.

4.4 Total fire ban

The state of Victoria experiences very hot windy days which may be declared as Total Fire Ban Days by the Country Fire Authority (CFA).

On days of total fire ban, no hot work is to be carried out in the open. Exemption permits can be obtained from the metropolitan fire brigade (MFB) (Tel:9665 4235) for any hot work required to be carried out in the open on a day of total fire ban.

Total Fire Ban Days are announced on the attached link:

<http://cfaonline.cfa.vic.gov.au/mycfa/Show?pageId=publicTotalFireBans>.

PoMC will not issue hot work permits for work in open areas on Total Fire Ban days.

4.5 Transfer operations – cargo and bunker

Hot work is not permitted in any area or hold where cargo transfer (loading and/or discharging) is being carried out. If hot work has to be carried out, cargo operations must be stopped or the hot work must be carried out during meal breaks or on completion of cargo operations.

Similarly, if bunker transfer operations are planned, the hot work is not permitted during the transfer operation. If hot work is to be carried out, then it must be at least 25 metres from the nearest vent pipe or flange during bunker transfer.

4.6 Working at heights

When working at elevated levels, prevention of falls must be observed by using:

- platforms or walkways on scaffolds with stairways and ladders
- trolleys or work boxes
- boom lifts or scissor lifts
- body harness with fall arrest systems when carrying out work near an unprotected edge.

4.7 Working near or over water

When working near or over water, the risk of falling into the water may be eliminated by considering the use of a fall prevention device.

When working near or over water, all personnel must use a Personal Floatation Device (PFD).

4.8 Working in trenches and open pits

Working in trenches and open pits is similar to working in a confined space, as mentioned in section 4.1.

Consideration should be given to shoring of trenches once the depth exceeds 1.2 metres.

Pipeline and cable location including dial before you dig must be undertaken prior to trenching.

4.9 Timber structures and decking

Timber structures and decking exist in many parts of the port. Before starting any hot work the timber structures and decking must be wetted down and preferably kept wet during the work. The timber structure and decking must be wetted down again on completion of any hot work.

4.10 Asbestos cladding and roofing

Asbestos cladding and roofing exists in many parts of the port. All asbestos related work must be done by an approved licence holder who holds a valid permit issued by PoMC. The transport and disposal of asbestos contaminated material must be done to Environment Protection Authority (EPA) standards.

4.11 Personnel

Personnel participating in hot work are as follows:

Supervisor

The role and responsibility of the supervisor is described in section 2.4 of this procedure.

Firewatch

A firewatch (as prescribed in AS 1674.1) must be present to oversee works in the advent of a fire outbreak or hazard. A firewatch must be ready to take immediate action to combat any outbreak of fire that may occur.

Fire watching does not consist of periodic checks, but is:

- a continuous and thorough inspection of the area
- present in the area and its vicinity
- attentive to the work, new developments and changing circumstances.

The firewatch must not leave the job unless properly relieved by a competent person.

Operating and maintenance personnel

These are personnel who are responsible for the safe conduct of the job. Their roles may be as follows:

- welder, fitters and turners fabricating the job
- riggers and scaffolders building staging for the job
- operators looking after plant and equipment.

Personnel involved in hot work shall not work alone.

5 Appendices

5.1 Appendix 1

5.1.1 Approvals and permits

The Port Management Act 1995 and the Port Management (Port of Melbourne Safety and Property) Regulations 2010 now make hot work a “Hazardous Port Activity”. This requires a mandatory application for authorisation and notification of proposal to carry out any hot work. All hot work within the port boundaries must be authorised by a PoMC Port Safety Officer. The PoMC Port Safety Officer can be contacted on:

Tel.: **03 9683 1594 (24 hours)**
Email: safety@portofmelbourne.com.

5.1.2 Emergency contacts

Emergency Services	000
Melbourne VTS (Harbour Control)	03 9644 9777
Land Assets	03 9612 3619
Water Assets	03 9612 3595
Port Security Officer	03 9612 3646
Port Security Control Room	03 9681 8044

5.2 Appendix 2

5.2.1 Licensed engineering companies

There are engineering companies that have received specific training in these guidelines and are licensed to comply with the working policy and procedure of the port. These engineering companies work under the guidelines of the port and will issue a hot work permit on behalf of the port before undertaking any work. The permit is titled Hot Work Permit Pursuant To Licence. The engineering company must notify the PoMC Port Safety Officer of the work being carried out before commencement of the work.

5.2.2 Engineering workshops

Ships' workshops designed specifically for hot work and fabrication are exempt from a permit provided:

- they observe these guidelines for hot work
- all flammable and combustible material are stored away from the area
- a fire protection system is in place for that area.