

Hot Work Procedure

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1 Purpose

The purpose of this Procedure is to address the fire, explosion and injury hazards associated with the performance of hot work i.e. any activity that creates a spark. This procedure complies with the *Work Health and Safety Act 2011 (Qld)*, *Work Health and Safety Regulation 2011 (Qld)*, and the latest *Welding Processes Code of Practice*.

In relation to hot work tasks, simply by nature of the plant and activities involved, there is significant potential to cause serious injuries and death where safe working practices are not properly implemented. In relation to hot work, a safe system must be implemented to control risks to health and safety arising from items such as:

- flammable and explosive gas atmospheres
- flammable liquids, either spilt, residue or within plant
- hot projectiles (grinding shards)
- combustible and flammable materials.

Wherever possible on PBPL sites, hot work activities are to be planned for and performed within designated hot work areas, which include:

- designated maintenance / repair workshops fitted with extraction and other easily accessible fire controls e.g. boilermaker and fitter workshops and adjacent hard stand area
- the “open deck” areas on the following vessels (except hot work to the vessel):
 - Ken Harvey – provided the hot work area is more than 2m from the fuel tank breather pipes
 - Turtle
 - TSHD Brisbane – on the main deck, provided the hot work area is more than 2m away from the fuel tank breather pipes.

Risk assessments may have to be completed before the hot work activity takes place. This will depend on site condition and other variables associated with the particular task and work area.

For all intensive hot work, **Hot Work Permits** need to be completed as well as **Isolation Permits**, where applicable.

Note:

- Hot work will not be performed while bunkering is taking place on any vessel.
- No flammable and / or combustible materials are to be stored within designated hot work areas.

People performing hot work need to be instructed in the safe use of and specific precautions required with all apparatus and tasks performed. People performing hot work must be assessed as competent by PBPL supervisors and/or as evidenced through the completion of specific trade/welding qualifications.

2 Scope

This procedure applies to all PBPL employees and work activities across the organisation.

3 Definitions

Term	Definition
Hot Work	Any activity that creates a spark, flame, or heat source, such as welding, cutting, or grinding.
Hot Work Area	Designated locations where hot work can be safely performed, such as workshops or specified vessel decks.
Hot Work Permit	A formal authorization required before performing intensive hot work tasks.
Isolation Permit	A permit is required when isolating energy sources during hot work activities.
Fire Watcher	A designated person who monitors the work area during and for at least 15 minutes after hot work to prevent fire hazards.
Flashback Arrestor	A safety device fitted to oxygen and fuel gas lines to prevent flame from traveling back into the equipment.
Voltage Regulation Device (VRD)	A device that reduces electric shock risk by controlling voltage on welding equipment.
LEL (Lower Explosive Limit)	The lowest concentration of a gas or vapor in air that can ignite; safe level is less than 5%.
Hazardous Area	Any location where flammable gases, vapors, or combustible materials may be present, requiring special controls and permits.
Bump Test	A functional test of gas detection equipment to ensure accurate readings before hot work begins.

4 Designated Workshop and Equipment Requirements

Workshop areas in which hot work activities are carried out are to be equipped to ensure safe gas supply.

Workshop areas are to contain adequate fire and emergency provisions such as fire extinguishers and fire detection systems and the accumulation of combustible and/or flammable substances is to be avoided through regular clean-up and extraction, etc. placement, type, and number of fire extinguishers within a workshop will depend on the equipment used and the nature of the hot work activities.

Cylinder storage areas are to be well ventilated, away from sources of heat, and lighting in the area is to be certified in accordance with *AS 2380.1 Electrical Equipment for Explosive Atmospheres – Part 1*. The storage area is to be maintained such that:

- all cylinders are stored vertically
- all cylinders are adequately restrained and secured against movement
- full cylinders are segregated from empty cylinders
- fuel gases are segregated from oxygen (e.g. acetylene and oxygen)
- signage, such as “No Smoking or Naked Lights” is displayed where fuel gases are stored
- there is a system of ‘first in, first out’ use (i.e. the cylinders that have been in storage for the longest period are to be used prior to newly purchased cylinders).

Gas cylinders in relation to welding apparatus are to be restrained and secured against movement at all times during storage, transport and use and they are not to be positioned in an access way or traffic area. Gas cylinders are not to be transported within closed vehicles.

All bottles, hoses and connections relating to welding apparatus which may be involved with hot work are to be checked to ensure that they are connected properly and ready for safe use prior to undertaking hot work activities.

Flash back arrestors, suitable for the types of equipment used are to be fitted into both oxygen and fuel gas lines at the regulator outlet and between the blowpipe and hose.

A Voltage Regulation Device (VRD) is to be operational on all electric welders.

5 Fire and Explosion Controls

During hot work activities, precautions are to be taken to prevent fire and explosion risks created from:

- ignition of explosive atmospheres (e.g. gas)
- sparks and hot metallic particles and slag being generated that can cause combustion and smouldering of adjacent materials
- electrode stubs that remain at high temperatures
- gas leakages, improper use of oxygen and unsafe equipment
- pierced or cut pressure hosing by sharp objects or burned hosing by sparks, flame or hot slag
- heating of gas cylinders
- welding and cutting containers and piping that contain unknown gases/substances capable of causing ignition or explosion
- burning or cutting through walls and partitions
- poor electrical connections
- igniting metallic and non-metallic dusts capable of causing fire or explosions.

Note:

The draining or opening of lines containing flammable substances and materials may also need to be supplemented by specific cleaning and rinsing prior to work.

As far as practicable, all flammable and combustible material, including remnants of fuel (e.g. fuel oil etc), gases, liquids and solids must be cleared from a minimum 15m radius around the hot work area where practicable. In addition, atmospheric testing using a certified gas detection meter is to be undertaken by a competent person prior to working in **hazardous areas** where flammable gases / liquids (i.e. vapours) may be located.

- Safe levels for oxygen (>19.5% and up to 23.5%) and LEL (<5%).
- Requirement for bump test certification and periodic monitoring intervals (e.g., every 15 minutes) for major hazard facilities.

The people involved in hot work tasks generally inspect and consider the capability of materials, stands etc to be used to support and hold components during hot work. Therefore, prior to and during work it can be identified and monitored that steel, sheeting and job piece supports are suitable and the likelihood of a fire or collapse can be minimised.

Precautions are to be taken wherever practicable to prevent sparks or flames from hot work tasks coming into contact with hoses and cylinders.

Hot work activities at height are to be specifically monitored to ensure that hot particles and slag cannot cause injury, fire, or explosion below.

Note:

This requirement is particularly important for areas above grid mesh, people, or other plant where controls such as floorboards, floor mats, covers or area exclusion through the use of barricades are required to be implemented. Catch mats or fireproof boards must be positioned over flooring, grates, and grid mesh to catch sparks and slag

Fire extinguishers suitable for the types of tasks performed are to be located within the immediate vicinity (within 10m) of people performing hot work. This may be easily achieved by securing fire extinguishers to welding trolleys and mobile units and through the hanging of extinguishers on workshop walls.

For outdoor work, a water hose must be run to the job location and primed ready for use, provided it does not create electrical hazards.

A designated Fire Watcher is to be used as a stand-by person where deemed necessary and as identified within the Hot Work Control Form as part of the Permit to Work documentation. The Fire Watcher must monitor the area during and for a minimum of 15 minutes after completion of hot work. Examples of specific activities where a Fire Watcher may be used include:

- tasks or work locations where a significant fire could develop
- work outdoors near vegetation and bushland
- where combustibles are present in or adjacent to the work area that cannot be removed
- hot work within confined spaces or hazardous areas.

As any use of an ignition source within a hazardous area is defined as part of the term hot work, a permit must be obtained for such tasks or access. Site specific **hazardous area** controls and signage requirements must also be implemented for example:

- Locate equipment outside the space where practicable.
- Ensure extraction fans are positioned close to contamination sources.
- Suspend welding/cutting activities by de-energizing power sources and depressurizing hoses during breaks.

Boilermakers are to be qualified in burn injury management as part of their *Save a Life* training.

Major Hazard Facility Requirements:

- Air monitor bump test before hot work.
- Initial and continuous LEL monitoring with recording intervals (**every 15 minutes**)
- Safety Case or risk assessment documentation for refueling facilities.
- Safe atmospheric levels: Oxygen >19.5% and up to 23.5%; LEL <5%.

6 Suppliers/Contractors and Labour Hire

Where suppliers/contractors are engaged to perform on-site hot work activities, the following relevant site-specific information is to be communicated during pre-contract consultation, the site induction process or pre-work supervisor communication:

- a copy of, or access to, the following is to be provided where hot work is to occur outside of a designated hot work area:
 - this Hot Work Procedure
 - Hot Work Control Form
 - Permit to Work Form
 - Plant Isolation Procedure
 - Confined Spaces Procedure
- the identity of relevant PBPL Permit to Work Authoriser
- access to necessary drawings, plans / maps relating to hazardous areas
- details regarding site specific rules and access restrictions
- details of specific hot work tasks to be performed and any site-specific hazards.

Prior to engaging suppliers/contractors or labour hire, the following information is to be verified:

- work experience, training and competency evidence to verify that suppliers/contractors are capable of performing the work and are familiar with the hazards
- work procedures or work method statements that identify key high-risk tasks, hazards, and controls to be implemented
- detailed listing of the plant and equipment to be brought onto site with respect to Australian Standard compliance, inspection and maintenance details (i.e. inspection records, logs, etc.)
- A VRD is to be fitted to the welding plant unless a risk assessment is undertaken.

Suppliers/contractors must obtain a PBPL Permit to Work prior to undertaking a specified hot work task outside of a designated hot work area.

During specific work activities, supervisors are to monitor the supplier/contractor's methods of work and the implementation of the proposed controls to ensure that PBPL standards for managing hot work activities are achieved.

7 Education and Awareness

All relevant PBPL people undertake Hot Work awareness training every three years, as part of the Permit to Work system training, in accordance with the Employee Compliance Training Matrix.

8 Records

All completed Hot Work Control forms, Permit to Work forms and relevant details regarding specific site hazardous areas, are to be filed and maintained in CREWS.

9 Non-Compliance

Breaches of this procedure may result in disciplinary action being initiated in accordance with PBPL's Code of Conduct.