

GUIDELINES FOR HOT WORK

1 SCOPE

This procedure gives guidelines for the precautions and preparation that should be followed to ensure that work covered by a hot work permit can be carried out safely without risk to people or property.

2 DEFINITIONS

- **Hazardous Area:** An area in which flammable liquids, vapours or gasses; combustible liquids, dust or fibres; or other flammable or explosive substance may be present.
- **Combustible Material:** Material that can maintain combustion without the addition of an external heat source, EG. timber framing present within wall and ceiling framing or forested areas containing dry grass.
- **Hot Work:** Grinding, welding, thermal or oxygen cutting or heating, and other related heat-producing or spark-producing operations.
- **Responsible Officer:** Trade Supervisor, Trade Foreperson, Project Manager, Tradesperson or Contractor having a satisfactory knowledge of the fire, explosion and toxicity hazards associated with hot work in hazardous areas and who is adequately trained and experienced in the procedures and precautions necessary for the elimination of any risk involved.

3 HOT WORK PERMIT

A QUT Hot work Permit is required for any maintenance or construction procedure involving hot work in:

- any hazardous area, or
- any area containing combustible materials where after consideration of the below General Precautions there are any 'YES' answers to the questions in Section 25 of this document.

GENERAL PRECAUTIONS

4 SUPERVISION

The Responsible Officer shall ensure that:

- The hazards of the location are identified;
- The means of managing the hazards is in place; and
- Hot Work in Hazardous Areas is referred to the Technical Officer Fire Services before approval to proceed is given.

5 PRIOR TO PERFORMING HOT WORK

Consider the following:

- Can hot work be avoided?
- Can you use a safer alternative?
- Can the work be done outside the building?
- Can cutting with hand or electric saws or pipe cutters replace flame cutting?
- Is it feasible to use a mechanical means of joining eg. nuts and bolts, screwed fittings or couplings?
- Is hand filing possible instead of grinding?
- Can threaded pipe be used instead of welded pipe?

6 COMPLIANCE

All hot work is to be conducted in accordance with AS 1674.1 Safety in Welding and Allied Processes.

7 GENERAL

This policy applies to any university employee or any contractor who is performing new construction, repair, maintenance, renovations and/or alterations that require hot work in any hazardous area or area containing combustible materials.

8 HOT WORK AREA

The area within a radius of 15m in the case of hazardous areas and 3m from combustible materials in any other area from the point where the hot work is to be undertaken, including the space above and below that area, should be made safe by various techniques, preparation and testing, to ensure that any risk of fire or explosion resulting from the hot work is eliminated.

The following containment's should be effected:

- The hot work area should be isolated using appropriate warning barriers.
- Vapour-tight barriers may be necessary between equipment, piping, sewers, tanks and the like that may contain hazardous materials and the hot work area. Screens should also be used to protect other workers from arc welding or cutting 'flash'.

- Any pipe or tank in the hot work area that may be a hazard should be positively isolated by blanking off, blinding, plugging or removing spool pieces and blanking off open ends.
- Discharge from pressure relief, excess flow and overflow valves should be piped to discharge at a safe area. It may be necessary to find other means of venting the adjacent lines, to eliminate the hazard of the relief valve opening while hot work is in progress.
- Valves, tappings and other equipment or facilities that may produce flammable or combustible liquids, gases or vapours in or around the safe area should be secured against inadvertent opening.

9 SAFE ATMOSPHERES

AS1674 gives recommended procedures to prepare for hot work on equipment that has held or may have held flammable or explosive substances.

Equipment, piping and tanks on which hot work is to be undertaken should be thoroughly drained, flushed with water, dried, steamed and air purged as necessary, to provide an atmosphere that can be tested and certified gas free, immediately before commencement of hot work.

Sludge and scale should be removed, as they may have entrapped volatile material that could be released and ignited by sparks or hot metal.

Ventilation should be provided to remove any existing fumes as well as those that may be generated from the work (eg welding). Ventilation may need to be mechanical.

10 HOUSEKEEPING

Combustible material that cannot be removed should be covered with a safety-secured non-flammable cover.

Oily surfaces and oil spills should be hosed down, then sanded over. Trash, oily rags and the like should be removed.

11 SEWERS AND DRAINS

For sewers and drains fitted with a p-trap or other type of seal, the operator should ensure that the bottom of the baffle is below water level. Sewers and drains should be covered by wet sandbags, to prevent escape of vapours from the sewer.

Where a hazard exists in the vicinity of vent pipes from a liquid seal, the vents should be plugged or otherwise blocked to prevent the escape of flammable vapours or gas.

12 FIREFIGHTING EQUIPMENT

On-site firefighting equipment should be serviceable and ready to operate should an emergency develop during a period of hot work. Users should be competent in its operation.

13 FIREWATCHERS

During progress of hot work, the assigned firewatcher should ensure that no condition arises, or action is taken, that will lead to a hazardous situation in the hot work area. Constant vigilance, checking of adjacent equipment and observance of safe practices is essential.

14 CONTAMINATED GROUND

Ground that has been contaminated by spilled flammable or combustible liquids should be covered with at least 50 mm of clean sand, and cleaned up and properly disposed of afterwards.

15 WIND

Wind may carry gases, vapour or dust into a hot work area from adjacent areas. Regular gas testing of hot work areas should be carried out to ensure that there is no ingress of flammable material.

16 MOVEMENT OF TRAFFIC

Whenever possible, vehicular traffic should be kept out of hot work areas while work is in progress.

17 OPENING OF DRAINS

Before drains or sewers are opened, hot work permits should be withdrawn, work stopped and a careful check made of smouldering materials.

18 FLAMMABLE LIQUIDS

Do not take flammable liquids, including cleaning solvents, into an area covered by a hot work permit.

19 WELDING EQUIPMENT

Welding machines and gas cylinders should be located in a known gas-free area at a safe distance from equipment being welded. Welding return leads should be connected as close as practicable to the weld (see AS 1674.2).

20 SHIELDING

Where shielding is required to confine a hot work area, non-combustible welding drapes should be used in preference to wet tarpaulins. Signs should be displayed warning of hazards eg welding flash.

21 JOB COMPLETION

At the completion of a job, the area/equipment should be returned to its normally secure mode and the firefighting equipment that has been brought to the hot work site should be returned to its normal storage.

HOT WORK

22 SPECIAL OPERATIONS

In some cases, it is necessary to carry out hot work on lines or equipment that are in service or where it is not possible to make a positive isolation. This type of work includes hot tapping, welding brackets and the like onto operating equipment, and welding on lines after cold cutting and plugging. Special precautions are required for this type of work and should be defined in the hot work permit. Further guidance on hot tapping is given in WTIA Technical Note 20.

23 ISOLATION OF FIRE DETECTION SYSTEMS

Contractors are to ensure fire detection systems in the area of the Hot Work are isolated as appropriate. Failure to do so will result in the contractor being billed for any costs of Qld Fire and Rescue Authority arising from false alarms.

24 QUESTIONNAIRE

Review the below questionnaire to determine if a hot work permit is required:

QUESTIONS	YES	NO
Do drains, pits and depressions need to be isolated and sealed?	•	•
Do combustible materials/gases need to be removed from the work area or made safe?	•	•
Do tanks, valves, vents and pipelines need to be blanked off or effectively isolated?	•	•
Is ventilation poor?	•	•
Are spark and splash screens required?	•	•
Are there contaminated areas to be covered?	•	•
Is there a need for fire equipment?	•	•
Is a firewatch required?	•	•
Is the wind direction and strength a factor?	•	•
Does the site of the Hot Work need to be isolated and barricaded off?	•	•

If there are any 'YES' answers then a Hot Work Permit is required.

HOT WORK PERMIT PROCEDURE

- Responsible Officer as required and person doing the work conduct thorough inspection of site where hot work is to be done in a hazardous area.
- Based upon a risk assessment, if the work is to be done in an area containing combustible materials that is not a hazardous area the Responsible Officer may elect to rely upon the person doing the work to conduct the inspection.
- Consider points previously raised in this document and on the Hot work Permit.
- Establish precautions that are to be taken.
- Hot work in any Hazardous Area is not to be undertaken unless the Technical Officer Fire Services has been consulted and his directions followed.
- Hot Work permit must be obtained prior to commencement of hot work. The form may be obtained from the Maintenance Services Workshop. Authorisation to proceed with hot work will be issued by the Responsible Officer.
- Person doing the work is to post the permit at the hot work location during the entire works
- If a fire watch is required the responsible Officer may inspect the work site during the works and for the required period after.
- Upon completion of the works the Responsible Officer as required and person doing the Work conduct thorough inspection of site where hot work was done.
- Return completed Hot work Permit to place of issue.

REMEMBER: WHEN IN DOUBT, FIND OUT!

HOT WORK PERMIT

- 1 Site location _____ Date _____
- 2 The hot work that is covered by this permit _____
- 3 The location of the hot work _____
- 4 The equipment to be used _____
- 5 The firefighting equipment to be laid out at the worksite _____
- 6 Whether the following checks have been made: (Note: All questions are to be answered and initialed by the issuing responsible officer. 'N.a' means 'not applicable').

6.1	Have drains, pits and depressions been checked, isolated and sealed?	Yes/N.a.
6.2	Are covers suspended below work to catch sparks where applicable?	Yes/N.a.
6.3	Have combustible materials been removed from the work area or made safe?	Yes/N.a.
6.4	Is floor swept clean and wet down as necessary?	Yes/N.a.
6.5	Are combustible floors/walls/ceilings been protected?	Yes/N.a.
6.6	Are all wall and floor openings protected?	Yes/N.a.
6.7	Are combustible materials on other side of wall or ceiling moved away?	Yes/N.a.
6.8	Have tanks, valves, vents and pipelines been blanked off or effectively isolated?	Yes/N.a.
6.9	Is ventilation adequate?	Yes/N.a.
6.11	Are spark and flash screens in place?	Yes/N.a.
6.12	Have leaks from flanges and the like been controlled?	Yes/N.a.
6.13	Have containers been purged of flammable liquids/vapours?	Yes/N.a.
6.14	Has contaminated ground been covered?	Yes/N.a.
6.15	Is the fire equipment checked and laid out ready for use?	Yes/N.a.
6.16	Is the fire pump or fire brigade on standby?	Yes/N.a.
6.17	Is a firewatch required? For a period of	Yes/N.a.
6.18	If required, has a firewatch been organised?	Yes/N.a.
6.19	Is the wind direction satisfactory for hot work to be done?	Yes/N.a.
6.20	Are smoke and/or thermal detectors been isolated?	Yes/N.a.
6.21	Has the site of the hot work been isolated (e.g. barricaded)	Yes/N.a.
6.22	Is gas testing required to check for ascertaining explosive atmosphere?	Yes/N.a.
6.23	Is explosive atmosphere in area eliminated?	Yes/N.a.
6.24	Other precautions taken? List?	Yes/N.a.

- 6.16 GAS TESTING (Note, if QUT staff are not trained sufficiently in this field external sources may need to be consulted):

Equipment make and model _____ Serial No. _____

Date of last equipment check _____

Date of test _____

Results of test: Percentage Lower Explosion Level. _____

Is hot work safe to proceed based on this level? _____

Initials of tester: _____

HOT WORK

7. The following conditions and precautions were observed:

8. This permit is valid from _____ am/pm on ___/___/___ to _____ am/pm on ___/___/___

9. Name of staff/contractor performing the work _____ Contact no. _____

10. The work site has been inspected and all precautions taken. Permit received by:

Person performing the work (print name)

(Signature)

11. The work site has been inspected by me and declared safe for hot work to proceed (mark N/A if in a Non-Hazardous Area and the Responsible Officer assesses inspection by the Person Doing The Work is sufficient following a risk assessment).

Responsible Officer (print name)

(signature)

12. This permit was returned/cancelled by:

(print name)

(signature)

To:

(print name)

(signature)

at am/pm ___/___/___

13. The worksite has been inspected by me at the expiry/cancellation of this hot work permit and declared safe for normal operations to resume.

Responsible Officer (print name)

(signature)

14. FIRE WATCH (IF REQUIRED) The worksite and adjacent areas where sparks may have spread were inspected by me during and for at least 30 minutes after the work was completed and no fire conditions were noticed.

Fire Watcher (print name)

(signature)

THIS HOT WORK PERMIT SHOULD BE PROMINENTLY DISPLAYED ON THE WORKSITE.

UPON COMPLETION RETURN THIS HOT WORK PERMIT TO THE PLACE OF ISSUE (Maintenance Workshop). Permit to be filed.