

Oxy-Acetylene Cutting and Thermal Lancing

| | | | |
|-------------------|--------|--------|--|
| Business Name: | | ABN: | |
| Business Address: | | | |
| Contact Person: | Phone: | Email: | |

THIS RISK ASSESSMENT IS APPROVED BY THE PCBU ON THIS PROJECT

Under the Work Health and Safety Regulation (WHS Regulation), a person conducting a business or undertaking (PCBU) is required to ensure that a RISK ASSESSMENT is prepared before the proposed work starts.

| | | |
|------------|--------|-------|
| Full Name: | | |
| Signature: | Title: | Date: |

CLIENT OR PRINCIPAL CONTRACTOR DETAILS

| | |
|---|----------------|
| Client: | SCOPE OF WORKS |
| Project Name: | |
| Project Address: | |
| Project Manager: | |
| Contact Phone: | |
| Date Risk Assessment supplied to Project Manager: | |



| RISK MATRIX | | | | | | | | | |
|----------------|---------------|------------|------------|---------|--------------|-------------|-----------------------------------|---|--|
| LIKELIHOOD | INSIGNIFICANT | MINOR | MODERATE | MAJOR | CATASTROPHIC | SCORE | ACTION | HIERARCHY OF CONTROLS | |
| ALMOST CERTAIN | 3 HIGH | 3 HIGH | 4 ACUTE | 4 ACUTE | 4 ACUTE | | | Elimination Remove the hazard. | |
| LIKELY | 2 MODERATE | 3 HIGH | 3 HIGH | 4 ACUTE | 4 ACUTE | 4A ACUTE | DO NOT PROCEED | Substitution Replace the hazard. | |
| POSSIBLE | 1 LOW | 2 MODERATE | 3 HIGH | 4 ACUTE | 4 ACUTE | 3H HIGH | Review before work starts. | Isolation Isolate People from the hazard | |
| UNLIKELY | 1 LOW | 1 LOW | 2 MODERATE | 3 HIGH | 4 ACUTE | 2M MODERATE | Ensure control measures in place. | Engineering Isolate the hazard | |
| RARE | 1 LOW | 1 LOW | 2 MODERATE | 3 HIGH | 3 HIGH | 1L LOW | Monitor and keep records. | Administrative Change | |
| | | | | | | | | PPE | |

| Risk Rating & Required Action: | |
|--------------------------------|---|
| 4A | Stop work. The risk is intolerable. Eliminate the hazard or redesign the activity before proceeding. A Safe Work Method Statement (SWMS) or higher-level authorisation is required. |
| 3H | Review and approve additional controls for the task parts. Senior supervisor sign-off needed. |
| 2M | Ensure all nominated controls are in place and effective. Proceed with caution; monitor conditions. |
| 1L | Proceed, following standard operating procedures. Monitor and keep records. |

| Consequence Scale: | | | |
|----------------------|---|--------------------|--|
| Consequence | People (injury/illness) | Project / Assets | Compliance / Reputation |
| Catastrophic | Fatality or permanent total disability | project shutdown | Significant regulator intervention; criminal prosecution |
| Major | Serious injury/illness (hospital > 5 days) | critical delay | Improvement notice; major media coverage |
| Moderate | Medical-treatment injury; lost-time > 1 day | moderate delay | Minor breach; adverse client comment |
| Minor | First-aid only, no lost time | negligible delay | Isolated non-conformance |
| Insignificant | No injury | no schedule impact | Deviation caught and corrected on site |

Notes on Hierarchy of Controls:
Remember to apply controls in the preferred order shown by the coloured pyramid:

1. **Eliminate**
2. **Substitute**
3. **Isolate**
4. **Engineering**
5. **Administrative**
6. **PPE**

Always document **why** a lower-order control is accepted if elimination or substitution is not reasonably practicable.

aligned with Safe Work Australia's Managing the risk of fatigue at work (2023) and ISO 45001:2018 clauses 6–8.

| JOB STEP | POTENTIAL HAZARDS | IR | CONTROL MEASURES | RR |
|--|--|--------------|--|---------------|
| SPECIFIC WORK STEPS | HAZARDS THAT MAY ARISE | INITIAL RISK | SPECIFIC MEASURES TO BE PUT IN PLACE TO ELIMINATE OR CONTROL THE RISKS | RESIDUAL RISK |
| 1. Governance, WHS Duties & Legislative Compliance | <ul style="list-style-type: none"> Lack of clear allocation of WHS responsibilities for oxy-acetylene cutting and thermal lancing activities under WHS Act 2011 and WHS Regulations PCBU, Officers and Supervisors unaware of due diligence obligations relating to high-risk hot work and open flame devices Absence of documented WHS policy addressing hot work, thermal cutting and blowtorch usage across the organisation Failure to identify and classify oxy-acetylene cutting and thermal lancing as high-risk work requiring formal risk assessment and control plans Inadequate consultation with workers and Health and Safety Representatives (HSRs) on hot work risks and controls No system to review and update procedures after incidents, near misses or legislative changes | 4A | <ul style="list-style-type: none"> Establish and maintain a documented WHS governance framework specifying PCBU, Officer, Supervisor and Worker duties for oxy-acetylene cutting, thermal lancing and other open flame devices, aligned to WHS Act 2011 and WHS Regulations Include hot work and thermal cutting risks within the organisation-wide WHS policy and risk management standards, endorsed and periodically reviewed by senior management Implement a formal legal compliance register that captures relevant Australian Standards (e.g. AS 4839, AS 1674 series), codes of practice and regulatory guidance for hot work and gas systems, with scheduled review dates Require completion of documented risk assessment and hot work permitting process for all oxy-acetylene cutting, torch usage and thermal lancing activities prior to commencement Establish a formal consultation procedure to involve workers and HSRs in development and review of hot work procedures, risk assessments and emergency plans Introduce a periodic management review process (e.g. annually) to evaluate the effectiveness of hot work risk controls, considering incident data, audit findings and changes to legislation or standards | 3H |
| 2. Plant, Equipment & Gas System Selection | <ul style="list-style-type: none"> Use of substandard or non-compliant oxy-acetylene equipment, hoses, regulators and torches Mismatched or incompatible components between oxygen, fuel gas and thermal lancing systems Lack of flashback arrestors, non-return valves increasing risk of explosion or fire within hoses and regulators Use of open flame devices and cutting torches without consideration of inherent safety features Failure to standardise equipment types across the site leading to inconsistent use and maintenance practices Procurement of equipment without reference to relevant Australian Standards and manufacturer specifications | 4A | <ul style="list-style-type: none"> Develop and implement a procurement standard specifying that all oxy-acetylene cutting, thermal lancing and open flame equipment must comply with relevant Australian Standards and manufacturer requirements Mandate the use of flashback arrestors, non-return valves and pressure regulators that are fit for purpose and compatible with each gas type and torch system Standardise brands and models of torches, regulators, hoses and thermal lances across the workplace to support consistent training, maintenance and spare parts management Require pre-acceptance inspections and commissioning checks for all newly purchased gas equipment, including verification of certification and pressure rating Maintain a controlled asset register for all gas cylinders, cutting torches, lances and associated equipment, including serial numbers, inspection due dates and service history Prohibit privately owned or improvised open flame devices from being used on site through a documented equipment approval procedure | 2M |

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| 3. Design & Layout of Gas Storage and Work Areas | <ul style="list-style-type: none"> Inappropriate siting of gas cylinder stores near ignition sources, traffic routes or confined spaces Insufficient segregation between oxygen and fuel gas cylinders leading to increased fire and explosion risk Poor ventilation in areas where oxy-acetylene cutting, thermal lancing or blowtorch usage is conducted Inadequate provision of fire-resistant barriers or separation distances from combustible materials Uncontrolled public or unauthorised access to gas storage and hot work zones Lack of designated safe areas for cylinder change-out, purging and leak testing | 4A | <ul style="list-style-type: none"> Design gas storage areas in accordance with relevant Australian Standards and regulatory guidance, ensuring appropriate separation distances, ventilation and signage Implement physical segregation (e.g. fire-rated walls, cages, marked zones) between oxygen and fuel gas cylinders, and from combustible materials and ignition sources Establish designated hot work zones for oxy-acetylene cutting and thermal lancing with adequate natural or mechanical ventilation engineered into the workplace design Install fixed fire-resistant barriers or screens around regular thermal cutting areas to contain sparks, slag and radiant heat away from flammables and walkways Control access to gas storage and hot work areas via locked compounds, key management and access authorisation procedures Provide clearly marked, level, and well-ventilated cylinder change-out stations with appropriate restraints, lighting and emergency shutdown facilities | 2M |
| 4. Gas Cylinder Management & Handling Systems | <ul style="list-style-type: none"> Cylinders not secured against falling impact or vehicle collision Incorrect storage of full and empty cylinders leading to confusion and potential misuse Inadequate systems for inspection, testing and rejection of damaged and out-of-test cylinders Uncontrolled transport of cylinders on vehicles or trolleys without restraints or valve protection Poor valve management practices, including leaving valves open when not in use No formalised system for leak detection and isolation of faulty cylinders or manifolds | 4A | <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> | 2M |
| 5. Hot Work & Open Flame Permit-to-Work System | <ul style="list-style-type: none"> Oxy-acetylene cutting or thermal lancing undertaken without formal authorisation or assessment of surrounding hazards Failure to identify and control combustible materials, flammable | 4A | <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> | 2M |

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| | <p>atmospheres or adjacent process risks prior to hot work</p> <ul style="list-style-type: none"> • Inadequate specification of fire watch, isolation and post-work monitoring requirements within the permit • Permit system not integrated with simultaneous operations (SIMOPS) or other high-risk work authorisation processes • Permits issued by personnel lacking competence in hot work risk assessment • Permit documentation inconsistent or not retained for review and auditing | | <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> | |
| 6. Procedures, Work Instructions & Standardisation | <ul style="list-style-type: none"> • Absence of documented procedures for oxy-acetylene cutting, thermal lancing and use of cutting torches and blowtorches • Reliance on informal or inconsistent work practices across different crews or shifts • Procedures not reflecting current plant configuration, materials or job types (e.g. thick steel sections, contaminated surfaces) • No clear instructions on maximum pressures, purge times, pre-heat durations or safe shutdown of thermal lancing systems • Lack of specific guidance for unusual or high-risk tasks such as cutting coated, insulated or confined components • Documented procedures not easily accessible or not used in planning and supervision | 3H | <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> | 2M |
| 7. Training, Licensing & Competency Management | <ul style="list-style-type: none"> • Operators of oxy-acetylene cutting and thermal lancing equipment lacking formal training or demonstrated competency | 4A | <p>[REDACTED]</p> | 2M |

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| | <ul style="list-style-type: none"> Supervisors unable to recognise unsafe thermal cutting practices or deficient risk controls No verification of qualifications or currency for contractors performing hot work Inadequate induction on site-specific hazards (e.g. combustible structures, ventilation constraints, process lines) Skills decay due to infrequent use of thermal lancing or specialised cutting techniques Training content focused solely on practical techniques without sufficient emphasis on system and management controls | | [REDACTED] | |
| 8. Planning, Job Design & Integration with Other Work | <ul style="list-style-type: none"> Thermal cutting or lancing planned without consideration of interaction with adjacent tasks or plant operations Inadequate assessment of material properties (e.g. flammable coatings, internal residues, pressurised contents) before selecting cutting methods Poor scheduling of hot work leading to congestion, overcrowding and increased cumulative risk Lack of alternative lower-risk cutting methods considered during planning (e.g. cold cutting, mechanical cutting) Inadequate communication of job plans to all affected workers and contractors Failure to consider fatigue, shift patterns or overtime when planning extended thermal cutting campaigns | 3H | [REDACTED] | 2M |
| 9. Fire, Explosion & Ignition Source Control Systems | <ul style="list-style-type: none"> Uncontrolled ignition of nearby combustibles from sparks, molten metal and slag during cutting or lancing Generation of explosive atmospheres from flammable vapours, gases or dusts exposed to open flames | 4A | [REDACTED] | 2M |

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| | <ul style="list-style-type: none"> Lack of suitable fire detection, suppression and first attack firefighting equipment in hot work areas No designated fire watch arrangements for high-risk thermal cutting activities Inadequate management of hot work on or near tanks, vessels or piping with unknown or hazardous contents Poor housekeeping leading to build-up of combustible waste, rags, packaging and offcuts in thermal cutting zones | | [REDACTED] | |
| 10. Ventilation, Fumes & Atmospheric Monitoring | <ul style="list-style-type: none"> Accumulation of welding and cutting fumes, gases and particulates in poorly ventilated areas Generation of toxic fumes when cutting painted, coated, galvanised or contaminated materials Oxygen enrichment or depletion in confined or poorly ventilated spaces during cutting operations Lack of atmospheric monitoring in areas where hazardous gases may be present or generated No system to assess and control exposure to airborne contaminants against workplace exposure standards Reliance solely on personal protective equipment without engineering or administrative controls for fume management | 3H | [REDACTED] | 2M |
| 11. Personal Protective Equipment & Clothing Management | <ul style="list-style-type: none"> Inadequate or inappropriate PPE for thermal cutting and lancing hazards (heat, sparks, UV, noise, fumes) Flammable clothing or synthetic materials worn in hot work areas increasing burn severity Inconsistent PPE use due to poor availability, enforcement or maintenance | 3H | [REDACTED] | 1L |

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| | <ul style="list-style-type: none"> No system for selection of respiratory protective equipment (RPE) based on risk assessment and exposure levels Incorrect storage, cleaning or replacement of PPE leading to degraded performance Lack of integration of PPE requirements into procurement, induction and supervision systems | | [REDACTED] | |
| 12. Maintenance, Inspection & Testing of Equipment | <ul style="list-style-type: none"> Failure of hoses, regulators, valves or torches due to wear, damage or lack of inspection Use of defective thermal lancing equipment, manifolds or connections No scheduled maintenance program for gas systems, flame arrestors and safety devices Repairs or modifications carried out by unqualified personnel using non-genuine parts Inadequate record keeping of inspections, calibration and repairs affecting traceability Undetected gas leaks from poorly maintained equipment leading to fire or explosion risk | 4A | [REDACTED] | 2M |
| 13. Contractor Management & Third-Party Interface | <ul style="list-style-type: none"> Contractors performing hot work cutting or lancing without alignment to the PCBU's WHS systems Gaps between contractor and client responsibilities for hot work permits, supervision and emergency response Inadequate pre-qualification of contractors regarding competency, equipment standards and insurance Contractor procedures conflicting with site rules for gas cylinder management and open flame control | 3H | [REDACTED] | 2M |

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| | <ul style="list-style-type: none"> Limited oversight of subcontractors engaged by primary contractors for specialised cutting or lancing tasks Language or cultural barriers affecting understanding of critical safety information | | [REDACTED] | |
| 14. Supervision, Monitoring & Behavioural Controls | <ul style="list-style-type: none"> Inadequate supervision of hot work areas leading to drift from procedures and permit conditions Normalisation of deviance where shortcuts in thermal cutting and lancing practices become accepted Failure to intervene when unsafe behaviours or system bypasses are observed Insufficient monitoring of compliance with cylinder storage, segregation and housekeeping rules No structured observation program to identify behavioural and cultural issues related to hot work Supervisors overextended across multiple high-risk tasks, reducing presence at critical activities | 3H | [REDACTED] | 2M |
| 15. Emergency Preparedness, Response & Incident Management | <ul style="list-style-type: none"> Lack of coordinated emergency response plans for major explosions or serious burns arising from thermal cutting and lancing Insufficient first aid capability for burns, smoke inhalation and eye injuries Emergency procedures not tailored to gas cylinder incidents, rapid evacuation or local site constraints Workers and contractors unfamiliar with emergency communication, muster points or shutdown requirements Inadequate incident reporting and investigation systems failing to identify root causes and corrective actions No post-incident review or learning process specific to hot work events | 3H | [REDACTED] | 1L |

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| | | | [REDACTED] | |
| 16. Documentation, Records & Continuous Improvement | <ul style="list-style-type: none"> • Incomplete or inaccurate records of permits, training, inspections and maintenance relating to hot work • Difficulty demonstrating compliance with WHS Act 2011 and Regulations due to poor documentation systems • Lack of trend analysis on incidents, near misses and audit findings specific to oxy-acetylene cutting and thermal lancing • No systematic process for capturing worker feedback on effectiveness of hot work controls • Obsolete documents remaining in circulation causing confusion and inconsistent practices • Continuous improvement activities not prioritised or resourced | 3H | <ul style="list-style-type: none"> [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] | 1L |
| | | | | |

SAMPLE

EMERGENCY RESPONSE – CALL 000 FOR EMERGENCIES

Ensure to have an Emergency Management Plan in place as well as adequate numbers of trained first aid staff with easy access to fully stocked first aid kits, rescue equipment, material safety data sheets, adequate access to emergency communication equipment and fire-fighting equipment suitable for all classes of fire and ignition sources.

LEGISLATIVE REFERENCES

RELEVANT LEGISLATION AND CODES OF PRACTICE. DELETE THE LEGISLATIVE REFERENCES FOR ANY STATE THAT ARE NOT APPLICABLE

Queensland & Australian Capital Territory

Work Health and Safety Act 2011
 Work Health and Safety Regulations 2011
 Legislation QLD: <https://www.worksafe.qld.gov.au/laws-and-compliance/work-health-and-safety-laws>
 Codes of Practice QLD: <https://www.worksafe.qld.gov.au/laws-and-compliance/codes-of-practice>
 Legislation ACT: <https://www.worksafe.act.gov.au/laws-and-compliance/acts-and-regulations>
 Codes of Practice ACT: <https://www.worksafe.act.gov.au/laws-and-compliance/codes-of-practice>

Victoria

Occupational Health and Safety Act 2004
 Occupational Health and Safety Regulations 2017
 Legislation VIC: <https://www.worksafe.vic.gov.au/occupational-health-and-safety-act-and-regulations>
 Codes of Practice VIC: <https://www.worksafe.vic.gov.au/compliance-codes-and-codes-practice>

New South Wales

Work Health and Safety Act 2011
 Work Health and Safety Regulations 2025
 Legislation NSW: <https://www.safework.nsw.gov.au/legal-obligations/legislation>
 Codes of Practice NSW: <https://www.safework.nsw.gov.au/resource-library/list-codes-of-practice>

Western Australia

Work Health and Safety Act 2020
 Work Health and Safety Regulations 2022
 Legislation Western Australia: <https://www.commerce.wa.gov.au/worksafe/legislation>
 Codes of Practice WA: <https://www.commerce.wa.gov.au/worksafe/codes-practice>

Northern Territory

Work Health and Safety (National Uniform Legislation) Act 2011
 Work Health and Safety (National Uniform Legislation) Regulation 2011
 Legislation NT: <https://worksafe.nt.gov.au/laws-and-compliance/workplace-safety-laws>
 Codes of Practice NT: <https://worksafe.nt.gov.au/factsheets-and-resources/codes-of-practice>

Safe Work Australia Links

Law and Regulation (All States): <https://www.safeworkaustralia.gov.au/law-and-regulation>
 Model Codes of Practice: <https://www.safeworkaustralia.gov.au/resources-publications/model-codes-of-practice>

South Australia

Work Health and Safety Act 2012 (SA)
 Work Health and Safety Regulations 2012 (SA)
 Legislation for SA: <https://www.safework.sa.gov.au/resources/legislation>
 Codes of Practice for SA: <https://www.safework.sa.gov.au/workplaces/codes-of-practice#COPs>

Model Codes of Practice

- Managing noise and preventing hearing loss at work
- Confined spaces
- Labelling of workplace hazardous chemicals
- Managing risks of hazardous chemicals in the workplace
- Welding processes
- First aid in the workplace
- Managing the risk of falls at workplaces
- Hazardous manual tasks
- Managing the risk of falls in housing construction
- Managing electrical risks in the workplace
- Demolition work
- Excavation work
- Work health and safety consultation, cooperation and coordination
- Managing the work environment and facilities
- How to manage work health and safety risks
- Managing risks of plant in the workplace
- Construction work

Tasmania

Work Health and Safety Act 2012
 Work Health and Safety (Transitional and Consequential Provisions) Act 2012
 Work Health and Safety Regulations 2012
 Work Health and Safety (Transitional) Regulations 2012
 Legislation for TAS: <https://worksafe.tas.gov.au/topics/laws-and-compliance/acts-and-regulations>
 Codes of Practice for TAS: <https://worksafe.tas.gov.au/topics/laws-and-compliance/codes-of-practice>

Details of permits, licenses or access required by regulatory bodies (add or delete as required):

- Permits from local council
- Authorisation to commence work
- Any required documents.