

High-Voltage Switching

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 and Consultation	<ul style="list-style-type: none"> Lack of clear allocation of WHS duties for high-voltage (HV) switching under the WHS Act 2011 leading to gaps in accountability and oversight Insufficient consultation with workers, Health and Safety Representatives (HSRs) and contractors on HV switching risks and procedures Inadequate integration of HV electrical safety into the organisation's WHS management system, policies and risk registers Failure to monitor compliance with WHS Act 2011, WHS Regulation and relevant electrical safety legislation, codes of practice and Australian Standards Unclear lines of authority for approving HV switching programs and for stopping work in unsafe conditions 	Extreme	<ul style="list-style-type: none"> Establish and document a governance framework for HV operations that clearly defines PCBUs, Officers, electrical managers and HV switching priorities, with roles and responsibilities aligned to WHS Act 2011 due diligence duties Integrate HV electrical risks into the corporate WHS register and ensure they are reviewed at executive and WHS committee level at defined intervals Develop a specific HV Electrical Safety Management Plan that references relevant legislation, WHS Regulation, Electrical Safety Act (where applicable) code of practice and Australian Standards (e.g. AS/NZS 3000, AS 2007, AS 4836) Implement a formal consultation process with workers and HSRs on HV switching procedures, changes to systems, introduction of new plans and findings from incident investigations and audits Require documented approval for all HV switching programs by a competent HV switching coordinator or authorised person with clear authority to postpone or cancel switching if risks are not adequately controlled Include HV electrical safety performance indicators (e.g. number of switching incidents, near misses, procedural deviations) in regular WHS leadership review and board reporting Ensure the WHS policy explicitly references high-risk electrical work, including HV switching, and sets expectations for compliance, reporting and continuous improvement 	Medium
2. Competency, Authorisation and Training Systems	<ul style="list-style-type: none"> Inadequate verification of competency for HV switching personnel (employees and contractors) Outdated or inconsistent authorisation processes for HV switching, access permits and isolation controllers Insufficient training on specific site network configuration, protection schemes and switching procedures Lack of assessment of non-technical skills such as communication, supervision and decision-making under pressure Inadequate induction for visiting or short-term contractors involved in HV switching or working near HV assets 	Extreme	<ul style="list-style-type: none"> Develop and maintain a formal competency framework for all HV roles (e.g. switching operators, permit issuers, system controllers, supervisors) specifying required qualifications, experience and refresher periods Implement a documented HV authorisation system with unique authorisation levels (e.g. switching, issuing access permits, testing) including initial assessment, written and practical examinations, and periodic re-authorisation Require verification of competency and licences for contractors before they are permitted to perform HV switching, with evidence recorded in contractor management systems Provide structured training programs covering site-specific network topology, protection settings, interlocks, remote control systems, operating limits and emergency procedures Incorporate scenario-based training and simulations (tabletop or practical) targeting non-technical skills such as clear radio communication, role clarity, cross-checking, and challenge-and-response culture Maintain a training matrix for all HV-authorized persons, including expiry dates, completed modules and any restrictions or conditions on authorisation Include HV electrical safety, network overview and local rules in all site inductions for personnel who may initiate, approve, supervise or be affected by HV switching Implement a process to temporarily suspend or restrict authorisations following significant incidents, competency concerns or extended absences from HV duties 	Medium

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3. Procedures, Work Instructions and Permit Systems	<ul style="list-style-type: none"> Absence of standardised HV switching procedures leading to inconsistent practices across shifts and sites Outdated or inaccurate switching instructions and single line diagrams causing incorrect isolation or energisation Ineffective permit-to-work and access permit systems that do not align with actual network configuration and hazards Overly complex or ambiguous documentation resulting in misinterpretation during time-critical switching Lack of formal process for managing deviations or changes to switching programs 	Extreme	<ul style="list-style-type: none"> Develop and maintain a controlled set of HV operating procedures, including generic and site-specific switching rules, isolation procedures, lockout-tagout requirements and access permit processes Ensure all HV switching is planned and documented using formally approved switching sheets or electronic equivalents, with stepwise logic, end points and independent verification requirements clearly specified Implement a robust permit-to-work system integrated with switching and isolation documentation, ensuring that work cannot commence until the network is in the prescribed safe state and permits are issued Keep all network diagrams, single line diagrams and protection settings under document control with revision history and ensure switching procedures clearly reference current versions Introduce a formal management of change (MOC) process for any alterations to network configuration, operating philosophy or protection that may affect switching instructions, including risk assessment and communication requirements Provide simplified guidance documents or decision trees for common switching scenarios, backed by detailed procedures, to reduce cognitive load while retaining controls Require documented approval and risk assessment for any deviation from standard switching procedures, with reasons, hazards and additional controls recorded Conduct periodic procedural reviews following incidents, near misses, system faults or network changes, engaging frontline workers in the review process 	Medium
4. Network Design, Engineering Controls and Protection Systems	<ul style="list-style-type: none"> Complex or poorly documented HV network design increasing risk of incorrect switching Inadequate or incorrectly set protection systems leading to failure to clear faults or nuisance tripping during energising Insufficient physical segregation, interlocking or barriers between live HV components and work areas Lack of engineering controls to prevent parallel feeds, cross-coupling or inadvertent energisation Obsolete or non-standard equipment with inconsistent operating characteristics and indications 	Extreme	<p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p>	Low

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			[REDACTED]	
5. Asset Management, Inspection and Maintenance Systems	<ul style="list-style-type: none"> Degraded or poorly maintained HV switchgear, cables, terminations and earthing systems increasing risk of failure during switching Lack of systematic inspection schedules leading to undetected defects such as partial discharge, insulation breakdown or corrosion Inadequate testing and maintenance of protection systems, interlocks and remote control equipment No prioritisation or tracking of HV defects, resulting in high voltage items remaining in service during switching operations Uncontrolled use of temporary repairs or bypasses that alter switching risk without appropriate assessment 	High	[REDACTED]	Low
6. Planning, Coordination and Operational Control of Switching	<ul style="list-style-type: none"> Inadequate planning of HV switching leading to time pressure, confusion and error Poor coordination between system control, field operators, contractors and affected facilities Switching carried out under emergency or unplanned conditions without appropriate risk assessment 	Extreme	[REDACTED]	Medium

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	<ul style="list-style-type: none"> • Simultaneous operations or unrelated work activities creating conflicting priorities and distractions • Communication failures (e.g. unclear instructions, radio interference, language barriers) during switching coordination 		[REDACTED]	
7. Isolation, Earthing, Access Control and Lockout-Tagout Systems	<ul style="list-style-type: none"> • Inadequate system controls to ensure plant is de-energised, isolated and earthed before work commences • Unclear demarcation between operational switching controls and work-party access controls • Failure to track multiple isolations and earths across complex networks, leading to unsafe removal or re-energisation • Inconsistent lockout-tagout practices across departments or contractors • Insufficient physical and administrative barriers to prevent unauthorised access to HV apparatus 	Extreme	[REDACTED]	Medium
8. Human Factors, Fatigue and Workload Management	<ul style="list-style-type: none"> • HV switching performed under fatigue, stress or reduced alertness (e.g. night shifts, long shifts, call-outs) 	High	[REDACTED]	Medium

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	<ul style="list-style-type: none"> • Cognitive overload due to complex procedures, time pressure or multiple concurrent tasks • Inadequate supervision or mentoring of newly authorised or infrequent switchers • Over-reliance on a small number of key individuals leading to burnout and single-point-of-failure risk • Work environments (noise, lighting, heat, crowding) that degrade attention and decision-making 		<p>[REDACTED]</p>	
9. Emergency Preparedness, Incident Response and Recovery	<ul style="list-style-type: none"> • Lack of structured response plans for HV electrical incidents such as flash, equipment failure, escalation or loss of supply • Inadequate coordination with emergency services and network operators during HV emergencies • Insufficient training and drills for workers on how to respond to HV incidents, including safe approach distances and rescue protocols • Delays or errors in isolating faulted equipment during an emergency due to unclear responsibilities or information • Poor post-incident management leading to recurrence of similar events 	High	<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>	Medium

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			[REDACTED]	
10. Contractor Management and Interface with External Parties	<ul style="list-style-type: none"> Contractors performing HV switching without alignment to the organisation's WHS and HV standards Unclear division of responsibilities and control between multiple PCBUs (e.g. client, principal contractor, network operator) under the WHS Act 2011 Inconsistent documentation, permits and procedures between different organisations on shared HV assets Inadequate pre-qualification and monitoring of contractor competence and performance in HV switching Poor communication of operational changes, system status and conditions to external parties 	High	[REDACTED]	Medium
11. Documentation, Records, Audit and Continuous Improvement	<ul style="list-style-type: none"> Incomplete or inaccurate records of switching operations, permits, incidents and maintenance Lack of systematic auditing of HV safety systems leading to undetected non-conformances Inability to demonstrate compliance with WHS Act 2011 due diligence and record-keeping requirements 	High	[REDACTED]	Low

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	<ul style="list-style-type: none"> Lessons from incidents and near misses not translated into system improvements Obsolete or uncontrolled documentation used as the basis for switching decisions 		<div style="background-color: black; height: 15px; width: 100%;"></div>	

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/laws-and-compliance/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.