

EXAMPLES OF SPECIFIC ELECTRICAL HAZARDS AND CONTROL MEASURES (Hierarchy of Controls)

Examples of electrical hazards

- Obvious damage, defects or modifications to the electrical equipment, including accessories, connectors, plugs or cord extension sockets
- Discolouration that may indicate exposure to excessive heat, chemicals or moisture
- Electrical cords are inappropriately positioned e.g. not effectively anchored, could pose a trip hazard or are inappropriately located in a walkway/thoroughfare
- Exposed energised parts:
 - bare conductors
 - internal parts of electrical equipment
 - external parts of electrical equipment that have become energised because of an internal fault
 - metallic or other conductive equipment that has inadvertently become live
- Operating conditions that could damage equipment e.g. outdoors, atmosphere, hostile environment, exposure to moisture, heat, vibration, mechanical damage, corrosive chemicals or dust
- Portable, plug in equipment including extension leads that are frequently moved
- Faulty equipment or installations (e.g. faulty light switch)
- Operating controls are not in good working order i.e. damaged or not appropriately identified
- Covers, guards etc are not secured and working in the manner intended by the manufacturer or supplier intended e.g. ventilation inlets and exhausts are obstructed
- Electrical fault – fire, burning, arcing (release of various gases and contaminants) or explosion
- Exposure to high electromagnetic fields (this may present a potential hazard for workers with some medical conditions e.g. pacemakers.)
- Inappropriate work practices/procedures e.g. failing to isolate equipment to carry out cleaning or maintenance
- Working with electrical equipment when on a ladder, tower, in a confined space or an atmosphere that presents a risk
- Working on energised electrical equipment (see WHS Regulations sections 152 – 162 for specific requirements.)
- Electrical drawings/tables not reflecting “as installed” installations
- Installing, operating, and maintaining solar power or photovoltaic (PV) systems is often high risk. Even if disconnected from the mains electrical supply or shutdown at the switchboard, PV systems can be energised by sunlight or stored energy in batteries.

Examples of risk control measures

In most cases, risk is controlled by a combination of several levels. Where the risk cannot be eliminated then consider Level 2 then level 3 and level 4 controls. Some options for consideration are as follows:

Hierarchy of control		Examples of control measures
Level 1	Elimination	<ul style="list-style-type: none"> • Ensuring equipment is de-energised. • Decommissioning/disposal of unsafe equipment.
Level 2	Substitution	<ul style="list-style-type: none"> • Replacing a hazardous process or item of equipment (e.g. using extra-low voltage electrical equipment such as a battery-operated tool rather than a tool that is plugged into mains electricity).
	Engineering/ Isolation	<ul style="list-style-type: none"> • Preventing workers from coming into contact with the source of an electrical hazard. • Use of insulation and guarding. • Protecting power circuits by the appropriate rated fuse or circuit breaker to prevent overloading • Ensuring circuits, where portable electrical equipment can be connected, are protected by appropriately rated RCDs (as required by the WHS Regulations). Refer to Appendix C for further information. • Establishing exclusion zones
Level 3	Administrative	<ul style="list-style-type: none"> • Provision of information, instruction, training and supervision. • Obtaining licences and permits. • Scheduling testing, tagging and maintenance of equipment and RCDs (Note the nature and frequency of inspection/testing will vary depending on the electrical risks.) • Use of isolation, lock off and Danger/Out of Service tags (refer to Isolation, locking off and access (Including tagging) - Appendix D). • Arranging electrical leads so they will not be damaged, run across floors/doorways/sharp edges. • Documenting Safe Operating Procedures (SOPs) where required by the risk assessment (The SOP could also specify when not to use leads and tools if this is foreseeable e.g. in damp or wet conditions unless they are specially designed for those conditions where applicable) • Use of warning signs • Emergency plans in the event of an electrical incident e.g. in a higher risk workplace, confined space, working at height, use of an elevating work platform, a workplace with a hazardous atmosphere).
Level 4	Personal Protective Equipment (PPE)	<ul style="list-style-type: none"> • Providing operators with appropriate safety equipment e.g. eyewear, insulated gloves, hard hats. (Refer to the Code of Practice “Managing electrical risks in the workplace” section 8.5 for the PPE requirements for electrical work.)

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