

Thermal Imaging

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:	

SAMPLE

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, Legal Compliance and WHS Duties	<ul style="list-style-type: none"> Lack of clear organisational policy for thermal imaging of electrical systems leading to inconsistent WHS standards across sites Failure to allocate and document WHS responsibilities for thermal imaging activities under WHS Act 2011 and WHS Regulations Inadequate consultation with workers, HSRs and contractors undertaking thermal imaging work Non-compliance with relevant standards and guidance (e.g. AS/NZS 3000, AS/NZS 4836, AS/NZS ISO 31000, Safe Work Australia codes of practice) Absence of documented risk management process specific to thermal imaging of live electrical installations No documented criteria for when thermal imaging may be done on energised equipment versus when isolation is required 	High	<ul style="list-style-type: none"> Develop and approve a corporate Thermal Imaging of Electrical Systems WHS Policy that references the WHS Act 2011, WHS Regulations and applicable Australian Standards and codes of practice Define, document and communicate roles and responsibilities for PCBUs, officers, managers, supervisors, electrical workers, thermographers and contractors involved in thermal imaging Implement a formal risk management procedure (hazard identification, risk assessment, control and review) specifically addressing high-voltage thermal imaging of energised electrical equipment Ensure executives and officers due diligence processes explicitly review WHS risks and controls relating to thermal imaging at least annually Establish and document criteria and decision-making protocols for when thermal imaging must only occur on de-energised isolated equipment versus when energised work is permitted under AS/NZS 4836 Implement documented consultation procedure requiring engagement with workers and HSRs on changes to thermal imaging procedures, equipment types and PPE requirements Maintain a compliance register for legislation, standards and guidance relevant to thermal imaging, with periodic review dates and assigned owners Integrate thermal imaging risks and controls into the organisation's overarching WHS management system and risk register 	Medium
2. Contractor and Personnel Competency Management	<ul style="list-style-type: none"> Use of thermography personnel without formal qualification or sufficient electrical safety training Inadequate verification of contractor licences, insurances and electrician authorisations Lack of competency in interpreting thermal images, leading to misclassification of risk and unsafe decisions Insufficient understanding of arc flash, electric shock, step and touch potential, and approach boundaries No explicit assessment of workers' fitness for work (fatigue, impairment) when performing thermal surveys in electrical rooms or switchyards 	High	<ul style="list-style-type: none"> Develop and enforce a competency framework for thermal imaging of electrical systems, specifying minimum qualifications (e.g. electrical licence where required, thermography certification, AS/NZS 4836 training) Implement a contractor pre-qualification process requiring evidence of relevant licences, insurances, training records and safe work procedures for thermal imaging Require documented and verified training in electrical safety, arc flash awareness and working near exposed live parts (aligned to AS/NZS 4836) for all personnel conducting or supervising thermal imaging Maintain a central competency and training matrix for all internal and external thermography personnel, with expiry and refresher dates Include site-specific and task-specific WHS induction modules that cover electrical infrastructure layout, restricted access zones, emergency procedures and reporting lines Implement a formal fitness-for-work policy addressing fatigue, drugs and alcohol, and medical conditions that may affect performance in high-risk electrical environments Require periodic practical assessments or field audits of thermography personnel to verify continued competency in both equipment use and risk controls 	Medium

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	<ul style="list-style-type: none"> Inadequate induction of contractors to site-specific electrical and WHS procedures 		<ul style="list-style-type: none"> Ensure supervision and mentoring arrangements are in place for new or inexperienced thermography staff until they are assessed as competent 	
3. Equipment Selection, Procurement and Verification	<ul style="list-style-type: none"> Procurement of thermal imaging cameras that are not suitable or rated for electrical environments or the voltage level being assessed Use of uncalibrated, poorly maintained or non-insulated equipment increasing risk of incorrect readings or electrical contact Lack of documented technical specifications and limitations (resolution, temperature range, emissivity settings) leading to misinterpretation of images Use of incompatible accessories, lenses or viewing windows that may compromise safety barriers on switchboards Absence of electrical safety ratings (e.g. CAT rating) for associated test equipment used alongside thermal cameras No system to ensure only approved and inspected thermal imaging equipment is deployed to site 	High	<ul style="list-style-type: none"> Develop procurement standards for infra-red thermal imaging equipment used on electrical systems, referencing relevant standards and manufacturer requirements for electrical environments Specify minimum technical and safety features for cameras (e.g. appropriate temperature range, resolution, focus method, field of view, data logging, protected visual imaging, IP rating) and ensure selection is endorsed by competent electrical engineer or senior electrician Require evidence of compliance with applicable product standards, insulation ratings and category ratings for all thermal imaging and ancillary equipment used near live conductors Establish a central approved equipment list and asset register for all thermal cameras and accessories used on electrical work, including unique ID, location and responsible custodian Implement documented pre-acceptance inspection and commissioning process (including calibration certification) before new thermal imaging devices are released for operational use Include procurement contracts clear obligations on suppliers regarding calibration intervals, servicing requirements, software support and safety bulletins Prohibit use of non-approved or personally owned thermal imaging devices for electrical surveys through formal policy and periodic field verification Ensure thermal imaging through infrared viewing windows or ports is compatible with switchboard design, ratings and original equipment manufacturer (OEM) instructions 	Medium
4. Calibration, Maintenance and Inspection Systems	<ul style="list-style-type: none"> Out-of-calibration thermal cameras leading to inaccurate temperature readings and misidentification of defects Lack of preventative maintenance program for cameras, batteries, chargers and accessories Failure to identify damaged housings, lenses or insulation that may expose workers to electrical contact or arc flash Inadequate tagging, tracking and service history resulting in use of unsafe or non-compliant devices No documented system for removing defective equipment from service Unmanaged firmware or software updates potentially affecting 	High	<p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p>	Low

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	performance or compatibility with existing analysis tools		[REDACTED]	
5. Thermal Imaging Procedures and Work Planning	<ul style="list-style-type: none"> Absence of standardised procedures for planning and conducting thermal imaging on electrical systems Inconsistent risk assessments for different sites, voltages and switchboard designs Unclear criteria for access to live electrical rooms, substations and switchboards during imaging Failure to control simultaneous activities (e.g. switching, testing, maintenance) that may interfere with thermal imaging work No formal review of single-line diagrams, load conditions and historical fault data prior to surveys Inadequate pre-job briefing leading to confusion about roles, coordination methods, escape routes and emergency shutdown options 	High	[REDACTED]	Medium
6. Electrical Safety, Arc Flash and Isolation Management	<ul style="list-style-type: none"> Exposure to arc flash and arc blast when imaging energised switchboards or busbars Risk of electric shock from inadvertent contact with exposed live parts or non-insulated components 	High	[REDACTED]	Medium

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	<ul style="list-style-type: none"> Inadequate arc flash study or missing incident energy calculations and labelling on switchboards Poorly defined approach boundaries and control of persons entering high-risk zones during imaging activities Unclear isolation and re-energisation procedures when thermal imaging identifies critical hot spots requiring immediate intervention Reliance on ad hoc decisions by field staff about acceptable proximity to live equipment 		[REDACTED]	
7. Data Integrity, Image Management and Reporting	<ul style="list-style-type: none"> Loss, corruption or mislabelling of thermal images leading to incorrect engineering decisions or missed defects Inconsistent image capture parameters (distance, emissivity, load level, ambient conditions) affecting comparability over time Lack of standardised reporting formats resulting in unclear risk rating or recommended actions for identified hot spots Unauthorised access to or modification of thermal imaging data affecting reliability and chain of custody Failure to communicate critical findings quickly to responsible electrical personnel and management No integration of thermal findings into asset management, maintenance planning and WHS risk registers 	Medium	[REDACTED]	Low

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8. Change Management, Design and Engineering Controls	<ul style="list-style-type: none"> • Uncontrolled changes to switchboard design, cable routing or load configurations invalidating previous thermal baselines • Failure to design new installations with adequate access for safe thermal imaging (e.g. absence of IR windows or safe viewing points) • Lack of engineering review when repeated hot spots are identified, leading to recurrence and potential fire or equipment failure • Modifications by third parties that increase arc flash risk or complicate thermal imaging access without being documented • No formal process for updating drawings, labels and arc flash assessments after plant changes • Inadequate integration of thermal imaging findings into long-term engineering and design improvements 	Medium	<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>	Low
9. Environmental, Site Access and Emergency Management	<ul style="list-style-type: none"> • Restricted or congested access routes leading to trip, slip and fall hazards during imaging activities • Poor lighting, ventilation or temperature extremes in electrical rooms affecting worker concentration and equipment performance • Inadequate emergency egress routes from substations, switchyards or plant rooms while personnel are conducting imaging • Presence of other hazards co-located with electrical equipment (e.g. noise, confined spaces, hazardous chemicals) complicating emergency response • Lack of clear signage and access control to high-voltage or restricted 	Medium	<p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p>	Low

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	<p>electrical areas during thermal imaging campaigns</p> <ul style="list-style-type: none"> No specific emergency response planning for arc flash, electrical shock or fire triggered by faults detected or aggravated during imaging 		[REDACTED]	
10. Training, Communication and Worker Engagement	<ul style="list-style-type: none"> Workers not fully understanding the purpose, limitations and risks of thermal imaging on electrical systems Inadequate communication of procedures, updates and lessons learned to field staff and contractors Failure to incorporate worker feedback about practical issues, near misses or equipment limitations Confusion about reporting channels for defects, hazards and incidents identified during imaging Insufficient awareness of WHS legislative duties and right to refuse unsafe work among photography personnel and supervisors Over-reliance on thermal imaging as a standalone control instead of part of a broader risk management strategy 	Medium	[REDACTED]	Low
11. Monitoring, Audit, Incident Management and Continuous Improvement	<ul style="list-style-type: none"> Failure to detect deteriorating WHS performance in relation to thermal imaging activities Under-reporting or poor investigation of near misses, defects and incidents linked to electrical and thermal imaging work 	Medium	[REDACTED]	Low

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	<ul style="list-style-type: none"> • Lack of formal audit against internal procedures, WHS legislation and relevant standards • No systematic review of whether thermal imaging programs are effectively reducing electrical risk and unplanned outages • Inadequate learning from incidents within the organisation or across the industry • Controls becoming outdated as technology, standards and site conditions evolve 		<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.