

**Fault Finding Diagnostics and System Testing**

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			<b>Elimination</b> Remove the hazard.	
LIKELY	2 MODERATE	3 HIGH	3 HIGH	4 ACUTE	4 ACUTE	4A ACUTE	DO NOT PROCEED	<b>Substitution</b> 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.	<b>Engineering</b> 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:	
<b>4A</b>	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.
<b>3H</b>	Review and approve additional controls before task starts. Senior supervisor sign-off needed.
<b>2M</b>	Ensure all nominated controls are in place and effective. Proceed with caution; monitor conditions.
<b>1L</b>	Proceed, following standard operating procedures. Monitor and keep records.

  

Consequence Scale:			
Consequence	People (injury/illness)	Project / Assets	Compliance / Reputation
<b>Catastrophic</b>	Fatality or permanent total disability	project shutdown	Significant regulator intervention; criminal prosecution
<b>Major</b>	Serious injury/illness (hospital > 5 days)	critical delay	Improvement notice; major media coverage
<b>Moderate</b>	Medical-treatment injury; lost-time > 1 day	moderate delay	Minor breach; adverse client comment
<b>Minor</b>	First-aid only, no lost time	negligible delay	Isolated non-conformance
<b>Insignificant</b>	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 Regulatory Compliance	<ul style="list-style-type: none"> <li>Lack of clear allocation of WHS duties for diagnostics activities under WHS Act 2011 and WHS Regulations</li> <li>Senior management not exercising due diligence in relation to diagnostic and testing risks</li> <li>Inadequate awareness of legal requirements for electrical, plant and pressure systems fault finding</li> <li>Absence of documented WHS policy covering diagnostic, testing and fault-finding activities</li> <li>Inadequate consultation with workers and HSRs on risks associated with fault finding and system testing</li> <li>Poor integration of WHS obligations into contracts with clients, OEMs and service providers</li> </ul>	4A	<ul style="list-style-type: none"> <li>Establish and maintain a WHS governance framework that explicitly covers fault finding diagnostics and system testing, aligned with WHS Act 2011 and WHS Regulations</li> <li>Define and document WHS roles, responsibilities and accountabilities for officers, managers, supervisors and workers involved in diagnostics and testing</li> <li>Ensure officers exercise due diligence by regularly reviewing diagnostic risk profiles, audit results, incident data and compliance against Australian standards and Codes of Practice</li> <li>Develop and communicate a WHS policy that specifically references engineered systems, diagnostic work, testing regimes and maintenance activities</li> <li>Implement a formal consultation process with workers and HSRs when introducing or changing diagnostic equipment, software tools or testing procedures</li> <li>Embed WHS requirements for fault finding and system testing into procurement contracts, service agreements and work scope documents</li> <li>Schedule periodic legal and standards compliance reviews to capture changes to WHS laws, electrical safety, plant safety and pressure systems obligations</li> <li>Maintain documented evidence (e.g. meeting minutes, training records, audits) demonstrating compliance with WHS duties for diagnostic and testing work</li> </ul>	2M
2. Competency, Licensing and Training for Diagnostics	<ul style="list-style-type: none"> <li>Inadequate technical competency for complex fault finding on engineered systems and existing installations</li> <li>Workers performing electrical or pressure diagnostics without required licences or qualifications</li> <li>Lack of specific training on diagnostic software, vibration analysis tools and specialised test equipment</li> <li>Insufficient understanding of system failure modes and limitations of diagnostic methods</li> <li>No structured assessment of competency prior to independent fault finding</li> <li>Poor refresher training on emerging technologies, firmware changes and updated diagnostic techniques</li> </ul>	4A	<ul style="list-style-type: none"> <li>Develop role-specific competency profiles for technicians engaged in fault finding, system diagnostics, vibration analysis and verification testing</li> <li>Ensure all personnel undertaking electrical, refrigeration, pressure or other regulated work hold and maintain relevant Australian licences and certifications</li> <li>Implement a formal training program covering diagnostic theory, system behaviour, failure modes, lock-out/tag-out interface, and safe testing principles</li> <li>Require practical competency assessments (including observed tasks and knowledge checks) before authorising staff to conduct independent diagnostics</li> <li>Provide vendor/OEM-endorsed training for proprietary diagnostic software, analysers, vibration monitoring systems and specialised test kits</li> <li>Maintain a competency matrix and training register that records initial, refresher and upgrade training for all diagnostic personnel</li> <li>Introduce mandatory refresher training when significant system upgrades, software revisions or equipment changes are implemented</li> <li>Restrict access to critical diagnostic functions (e.g. firmware flashing, protection setting changes) to nominated competent personnel only</li> </ul>	2M
3. Technical Documentation and Information Management	<ul style="list-style-type: none"> <li>Outdated or incorrect schematics, P&amp;IDs, wiring diagrams and configuration files used during fault finding</li> </ul>	3H	<ul style="list-style-type: none"> <li>Implement an electronic document management system (EDMS) with version control for all technical drawings, manuals, diagnostic procedures and test specifications</li> </ul>	1L

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	<ul style="list-style-type: none"> <li>Missing OEM manuals, diagnostic procedures or software instructions</li> <li>Uncontrolled paper copies of drawings leading to use of superseded information</li> <li>Poor version control of firmware, configuration baselines and calibration records</li> <li>Inadequate access to historical maintenance, breakdown and vibration trend data</li> <li>Lack of clear documentation for non-standard modifications or temporary repairs</li> </ul>		<ul style="list-style-type: none"> <li>Maintain a single source of truth for system configurations, firmware versions and protection settings, with authorisation controls for changes</li> <li>Establish a change management process requiring engineering approval and document updates when modifications or system upgrades are performed</li> <li>Ensure all technicians have ready access (online or offline) to current drawings, OEM manuals, fault-finding guides and vibration analysis criteria</li> <li>Create and manage a central asset history including maintenance, calibration, breakdown, diagnostic findings and trend reports</li> <li>Prohibit use of uncontrolled printed drawings by using watermarks or expiry dates and encouraging access via tablets or e-readers</li> <li>Require documentation of any temporary bypasses, workarounds or non-standard connections, including risk assessment and sign-off</li> <li>Conduct periodic audits to verify technical documentation accuracy against actual plant and installations</li> </ul>	
4. Diagnostic Equipment, Tools and Calibration Systems	<ul style="list-style-type: none"> <li>Use of faulty, uncalibrated or unsuitable test instruments for electrical and mechanical diagnostics</li> <li>Incorrect vibration sensors, mounting methods or ranges leading to misinterpretation of machine condition</li> <li>Incompatible interfaces between diagnostic equipment and control systems causing damage or unsafe states</li> <li>Lack of inspection and maintenance regime for test leads, probes, clamps, pressure hoses and adaptors</li> <li>Shared or uncontrolled credentials and access tokens for diagnostic software and remote access tools</li> <li>Inadequate electromagnetic compatibility of diagnostic tools impacting safety-critical control systems</li> </ul>	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. Work Planning, Permit to Work and Isolation Interfaces	<ul style="list-style-type: none"> <li>Unplanned or ad-hoc fault finding without formal risk assessment or work planning</li> <li>Diagnostics commenced without verifying plant status, isolations or energy states</li> </ul>	4A	<p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p>	2M

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	<ul style="list-style-type: none"> <li>• Overlap and conflicts between diagnostic activities and live operations or production demands</li> <li>• Bypassing of interlocks or safety systems during testing without formal authorisation</li> <li>• Inadequate interface between permit to work, lock-out/tag-out and diagnostic requirements</li> <li>• Incomplete communication of isolation boundaries to diagnostic personnel</li> </ul>		[REDACTED]	
6. Management of Live Testing and Commissioning-Type Activities	<ul style="list-style-type: none"> <li>• Uncontrolled exposure to live electrical, hydraulic, pneumatic or rotating equipment during operational tests</li> <li>• Unexpected energisation or automatic start of machinery during fault replication or system proving</li> <li>• Inadequate exclusion zones during vibration analysis and performance verification on operating machinery</li> <li>• Incorrect re-installment of interlocks, guards or protective devices during testing</li> <li>• Inadequate supervision of high-risk dynamic testing and commissioning activities</li> <li>• Live testing that adversely affects system stability or process safety (e.g. trips, pressure surges)</li> </ul>	4A	[REDACTED]	2M
7. Change Management and Configuration Control During Fault Rectification	<ul style="list-style-type: none"> <li>• Uncontrolled changes to control logic, protection settings or equipment parameters during troubleshooting</li> <li>• Temporary workarounds or patches becoming permanent without risk review</li> <li>• Loss of baseline configuration due to undocumented firmware or settings changes</li> </ul>	4A	[REDACTED]	2M

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	<ul style="list-style-type: none"> <li>• Conflicting changes made by multiple technicians or external vendors</li> <li>• System performance drift after minor parameter changes not being monitored</li> <li>• Inadequate back-out plans if configuration changes introduce new faults or hazards</li> </ul>		[REDACTED]	
8. Data Quality, Diagnostic Interpretation and Human Error	<ul style="list-style-type: none"> <li>• Incorrect diagnosis due to misinterpreted vibration data, sensor noise or transient conditions</li> <li>• Over-reliance on software diagnostics without critical evaluation of underlying data</li> <li>• Cognitive overload or distraction leading to misreading of system parameters or trends</li> <li>• Confirmation bias resulting in premature conclusions and inappropriate repairs</li> <li>• Inadequate peer review of complex diagnostic conclusions on highly critical systems</li> <li>• Use of inappropriate acceptance criteria or thresholds for performance verification</li> </ul>		[REDACTED]	1L
9. Interfaces with Contractors, OEMs and Remote Support	<ul style="list-style-type: none"> <li>• Contractors or OEM technicians performing diagnostics without understanding site-specific hazards and procedures</li> <li>• Remote access sessions altering system configurations without adequate oversight</li> <li>• Poor communication between internal staff and external specialists leading to conflicting instructions</li> </ul>	3H	[REDACTED]	1L

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	<ul style="list-style-type: none"> <li>Inadequate vetting of contractor competency for specialised diagnostics (e.g. main engine vibration analysis)</li> <li>Lack of clarity on who controls the plant during external diagnostic interventions</li> <li>Unrecorded changes or advice from remote support not integrated into site documentation</li> </ul>		[REDACTED]	
10. Asset Integrity, Deterioration Monitoring and Reliability Programs	<ul style="list-style-type: none"> <li>Undetected deterioration of critical equipment due to inadequate monitoring regimes</li> <li>Reactive-only maintenance approach causing rushed, high-risk diagnostics after failures</li> <li>Incomplete integration of vibration analysis, condition monitoring and fault histories into maintenance planning</li> <li>Failure to recognise early warning signs of systemic issues across multiple assets</li> <li>Inadequate prioritisation of defects and recommendations arising from diagnostic activities</li> <li>Loss of reliability of critical systems are upgraded or replaced</li> </ul>	3H	[REDACTED]	1L
11. Fatigue, Workload and Time Pressure in Fault Response	<ul style="list-style-type: none"> <li>Technicians attending to urgent call-outs for urgent breakdown diagnostics while fatigued</li> <li>Compressed timeframes for fault finding and repair due to production pressures</li> <li>Extended troubleshooting sessions on complex systems without adequate breaks</li> <li>Inadequate staffing levels resulting in single-person diagnostics for high-risk tasks</li> </ul>	3H	[REDACTED]	2M

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	<ul style="list-style-type: none"> <li>Management expectations that discourage escalation or job rescheduling when risks increase</li> <li>Increased likelihood of human error in data interpretation and configuration changes under fatigue</li> </ul>		[REDACTED]	
12. Workplace Environment, Access and Layout for Diagnostic Activities	<ul style="list-style-type: none"> <li>Poor access to diagnostic points on engines, auxiliary equipment and control panels leading to unsafe body positioning</li> <li>Inadequate lighting, noise and environmental conditions during troubleshooting</li> <li>Congested work areas around machinery under test, increasing slip, trip and impact risks</li> <li>Inadequate fixed provisions (test points, isolation valves, monitoring ports) requiring improvised connections</li> <li>Diagnostic stations or laptops set up in unsafe zones near rotating machinery or hot surfaces</li> <li>Environmental contamination (dust, moisture, chemicals) affecting diagnostic equipment and readings</li> </ul>	3H	[REDACTED]	1L
13. Emergency Preparedness During Diagnostics and System Testing	<ul style="list-style-type: none"> <li>Delayed response to equipment instability or abnormal behaviour observed during testing</li> <li>Unclear emergency stop responsibilities when multiple parties are involved in diagnostics</li> <li>Inadequate planning for worst-case outcomes of performance tests (e.g. engine overspeed, pressure excursions)</li> <li>Limited awareness of isolation points and emergency shut-down procedures by diagnostic personnel</li> <li>Emergency equipment not suited to hazards associated with diagnostic work (e.g. arc flash, fluid release)</li> </ul>	3H	[REDACTED]	1L

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	<ul style="list-style-type: none"> <li>Insufficient drills or simulations for emergency scenarios arising specifically from testing activities</li> </ul>		[REDACTED]	
14. Information, Consultation and Reporting for Diagnostic Activities	<ul style="list-style-type: none"> <li>Workers not informed about planned diagnostic activities that may affect system performance or availability</li> <li>Under-reporting of near misses, misdiagnoses or test-related incidents</li> <li>Limited consultation with frontline technicians when developing diagnostic procedures or selecting tools</li> <li>Inadequate communication of known system anomalies, temporary bypasses or degraded modes of operation</li> <li>Lack of feedback loop from diagnostic findings to broader WHS and maintenance planning</li> <li>Inconsistent handover of diagnostic status between shifts or work groups</li> </ul>	3H	[REDACTED]	1L
15. Continuous Improvement, Auditing and Assurance of Diagnostic Systems	<ul style="list-style-type: none"> <li>Stagnant diagnostic practices that do not keep pace with technology or emerging risks</li> <li>Undetected non-compliance with diagnostic procedures, permit to work or isolation requirements</li> <li>No systematic review of the effectiveness of diagnostic-related controls after incidents or major faults</li> <li>Fragmented lessons learned, with improvements not shared across sites or teams</li> <li>Over-reliance on individual experts without institutionalising knowledge in systems and procedures</li> <li>Audit findings not leading to timely corrective and preventive actions</li> </ul>	3H	[REDACTED]	1L

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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.