

CNC Machining Centre

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 before task starts. 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 WHS governance for CNC operations leading to non-compliance with WHS Act 2011 and WHS Regulation Inadequate Officer due diligence in relation to high-risk plant such as CNC drilling lines, bandsaws, lathes, milling machines, routers, punch presses, plasma/waterjet cutters, wire EDM and robotic machining cells Poor consultation with workers, HSRs and contractors about design, operation and changes to CNC machining centres Absence of a documented WHS management system specific to automated and robotic CNC plant Inadequate assignment of roles, responsibilities and authority for managing CNC-related risks Insufficient mechanisms for workers report hazards, near misses or safety concerns about CNC equipment 	High	<ul style="list-style-type: none"> Establish a documented WHS management system aligned with WHS Act 2011, WHS Regulation and relevant Codes of Practice (e.g. Managing Risks of Plant, Managing Risks of Hazardous Chemicals in the Workplace) Define and document WHS roles, responsibilities and accountabilities for PCBUs, Officers, managers, supervisors, maintenance personnel, programmers, operators and contractors involved with CNC equipment Implement an officer due diligence framework including regular WHS reports on CNC plant risks, performance indicators, incidents, audit findings and corrective actions Set up formal consultation arrangements with workers and HSRs on CNC plant design, selection, modifications, control measures and procedures, including toolbox talks and safety committee meetings Implement a structured hazard and near-miss reporting process (e.g. electronic reporting system) with clear timeframes for review, action and feedback to workers Ensure change management and consultation processes are triggered for any introduction, modification, relocation or decommissioning of CNC machinery or robotic cells Integrate CNC safety requirements into site induction, contractor management and procurement policies 	Medium
2. Plant Procurement, Design and Commissioning	<ul style="list-style-type: none"> Selection of CNC equipment (drilling line and bandsaw, lathes, milling machines, routers, plasma/waterjet cutters, punch presses, wire EDM, robotic machining) that does not comply with Australian standards or is unsuitable for the intended use Failure to obtain or review supplier/manufacture documentation, risk assessments, load ratings, guarding requirements and safety functions before purchase Inadequate consideration of automation interfaces, robotic integration and material handling systems at the design stage Lack of design review for guarding, interlocks, emergency stops, light curtains, pressure mats and perimeter 	High	<ul style="list-style-type: none"> Implement a formal plant procurement procedure requiring pre-purchase WHS review for all CNC and robotic machining equipment, including compliance with relevant Australian Standards (e.g. AS 4024 series for safety of machinery) Require suppliers to provide documented risk assessments, technical specifications, safety function descriptions, manuals and evidence of conformity before purchase and commissioning Conduct multi-disciplinary design reviews (WHS, engineering, maintenance, operators, HSRs) for proposed CNC installations, including robotic cells and material handling equipment Specify guarding, interlocking, emergency stop, light curtain, pressure mat, perimeter fencing and access control requirements at the procurement and contract stages Ensure layout design allows adequate clearances, safe access for loading/unloading, maintenance and cleaning, and compliant emergency egress routes Develop and implement a formal commissioning procedure including verification of all safety functions, interlocks, protective devices and software safety parameters before production use Require a commissioning sign-off process with documented testing results, residual risk assessment and handover training from supplier to site personnel 	Medium

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	<p>fencing around CNC and robotic machining centres</p> <ul style="list-style-type: none"> Insufficient space, access and egress in the layout design leading to congestion, restricted movement and unsafe maintenance access Commissioning activities not formally planned or risk assessed, leading to uncontrolled energisation, unexpected plant movement or incomplete safety systems 			
3. Plant Registration, Documentation and Configuration Control	<ul style="list-style-type: none"> Failure to identify CNC machinery that is registrable as a design or item of plant under WHS Regulation Incomplete or missing plant risk assessments, manuals, schematics and safety function descriptions for CNC and robotic equipment Uncontrolled changes to CNC parameters, safety PLC programs, interlock logic or robotic paths leading to defeat of safety systems Lack of version control for CNC programs, machining parameters, tool libraries and robotic trajectories Inadequate recording of plant modifications, repairs and upgrades affecting safety performance 	High	<ul style="list-style-type: none"> Review WHS regulatory requirements and ensure applicable CNC plant and pressure equipment associated with CNC systems are correctly registered with the regulator where required Maintain a comprehensive plant register for all CNC machines and robotic cells, including make, model, serial number, location, duty, registration details and key safety features Ensure up-to-date documentation is available and controlled, including OEM manuals, electrical and pneumatic schematics, guarding layouts, safety integrity level (SIL/PL) assessments and risk assessments Implement strict configuration management and change control for CNC and robot programs, safety PLC logic, interlock settings and parameter sets with formal approval, testing and sign-off Establish a version control system for CNC machining programs, tool databases and robotic paths, including backup and rollback procedures Record all plant modifications, retrofits and safety upgrades in the plant register, including updated risk assessments and compliance verification 	Medium
4. Site Layout, Traffic Management and Work Environment	<ul style="list-style-type: none"> Poor layout of CNC machining centres resulting in pedestrian and mobile plant interaction around loading/unloading zones Inadequate segregation around CNC drilling lines, bandsaws, routers and robotic cells leading to encroachment into danger zones Insufficient lighting, ventilation and noise control in CNC machining areas Uncontrolled storage of raw materials, finished product, pallets and waste creating trip hazards and blocked access to emergency stops and exits 	High	<p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p>	Medium

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	<ul style="list-style-type: none"> Inadequate floor condition and housekeeping around coolant, waterjet overspray, oil and metal swarf leading to slips and falls 		[REDACTED]	
5. Hazard Identification, Risk Management and Change Management	<ul style="list-style-type: none"> No systematic process for identifying and assessing risks associated with CNC and robotic machining operations across their lifecycle Failure to reassess risks when new CNC machines or tooling are introduced, or when software, guarding or process changes occur Informal or undocumented responses to incidents, near misses and breakdowns involving CNC plant Lack of structured change management for modifications to fixturing, tooling, cutting parameters, materials and automation interfaces 	High	[REDACTED]	Medium
6. Training, Competency and Authorisation	<ul style="list-style-type: none"> Operators, programmers and setters of CNC machines lacking formal competency in CNC operation, programming, work setup, tool selection and emergency response Maintenance personnel not trained in the specific hazards of CNC systems, including stored energy, software safety interlocks and robotic movement Insufficient training on safe use of CNC control interfaces, human-machine interfaces (HMIs) and manual override functions No system to ensure only authorised and competent persons operate or modify CNC programs and robotic paths Contractors engaged for CNC installation or maintenance without verification of competencies or understanding of site WHS requirements 	High	[REDACTED]	Medium

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7. Safe Work Procedures and Operating Systems	<ul style="list-style-type: none"> Absence of documented safe work procedures for CNC machining operations, tool change, setup, workholding configuration and clearing jams Inconsistent operating practices between shifts leading to bypassing of guards and interlocks Uncontrolled use of manual modes, jog functions and program overrides on CNC and robotic machinery Lack of standardised procedures for loading/unloading heavy workpieces and fixtures into CNC drilling lines, bandsaws, lathes, routers and machining centres 	High	[REDACTED]	Medium
8. Guarding, Interlocks and Machine Safety Systems	<ul style="list-style-type: none"> Inadequate fixed and interlocked guarding on CNC machining centres exposing workers to rotating spindles, cutting tools, bandsaw blades, chucks and moving axes Defeat or bypass of door interlocks, light curtains, pressure sensitive perimeter guards on CNC and robotic equipment Failure or malfunction of emergency stop systems, two-hand controls and safety PLCs Insufficient inspection and testing of safety devices on CNC machines, plasma/waterjet cutters and robotic cells Retrofitted guarding not compliant with relevant Australian Standards or not integrated with control systems 	High	[REDACTED]	Medium
9. Lock-Out, Tag-Out and Isolation Systems	<ul style="list-style-type: none"> Unexpected energisation or movement of CNC axes, spindles, bandsaw blades, conveyors, robots or tool changers during maintenance, cleaning or fault-finding Stored energy hazards from hydraulics, pneumatics, spring tension, gravity and 	High	[REDACTED]	Medium

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	<ul style="list-style-type: none"> charged capacitors in CNC and robotic systems Inconsistent or informal isolation practices between different teams and contractors Lack of clear identification of isolation points for CNC plant, ancillary equipment and services (e.g. dust extraction, coolant systems, high-pressure waterjet pumps) 		[REDACTED]	
10. Maintenance, Inspection and Asset Management	<ul style="list-style-type: none"> Breakdown maintenance culture leading to operation of CNC machines with known defects such as damaged guards, inoperative interlocks or worn components Lack of systematic preventive maintenance for high-risk CNC elements including spindles, tool changers, clamps, bandsaw blades, plasma torches, waterjet heads and robotic joints Failure to inspect and maintain extraction systems, coolant systems and high-pressure hoses on plasma and waterjet cutting machines Use of non-genuine or incorrect spare parts affecting safety performance and reliability of CNC machinery Inadequate maintenance planning causing rushed work, operator fatigue and increased risk of error 	High	[REDACTED]	Medium
11. Programming, Tooling and Process Control	<ul style="list-style-type: none"> Incorrect or unverified CNC and robotic programs leading to unexpected tool paths, collisions or ejection of workpieces and tooling Inappropriate selection of cutting parameters, tooling, fixtures and clamps for the material and process (milling, turning, drilling, punching, plasma cutting, waterjet cutting, routing, EDM) Uncontrolled program changes by unauthorised personnel resulting in 	High	[REDACTED]	Medium

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	<ul style="list-style-type: none"> unsafe speeds, feeds or motion sequences Lack of simulation or dry-run verification for complex 5-axis CNC router operations and robotic machining programs 		[REDACTED]	
12. Hazardous Substances, Fumes and Environmental Controls	<ul style="list-style-type: none"> Exposure to metal dust, fumes and gases from plasma cutting, machining of certain alloys and welding-related processes near CNC areas Coolant and lubricant mists from CNC milling, turning, drilling and grinding operations Waterjet cutting splash and contaminated water management, including fine particulates and metal residues Incorrect storage, handling or disposal of cutting fluids, cleaning agents and sludge from CNC sumps and filters Inadequate assessment of hazardous chemicals under WHS Regulation leading to uncontrolled release and environmental releases 	High	[REDACTED]	Medium
13. Ergonomics, Manual Handling and Work Organisation	<ul style="list-style-type: none"> Poorly designed workstations and CNC machines resulting in awkward postures, repetitive reaching and forceful movements during loading/unloading and setup Manual handling of heavy raw materials, jigs, fixtures and finished components without mechanical aids or planning Cognitive overload for operators managing multiple CNC machines, HMIs and alarms simultaneously Shift work, extended hours and production pressure contributing to fatigue and decreased attention to CNC safety systems 	Medium	[REDACTED]	Low

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14. Personal Protective Equipment and Clothing Policies	<ul style="list-style-type: none"> Inadequate or inconsistent use of PPE in CNC machining areas, especially near metal cutting, plasma and waterjet operations Loose clothing, jewellery or hair presenting entanglement risks with rotating CNC equipment and moving parts Lack of eye and face protection policies for operations with risk of flying chips, sparks or splash Inappropriate footwear leading to slips on coolant-contaminated floors and increased risk of foot injury from dropped materials 	Medium	[REDACTED]	Low
15. Emergency Preparedness and Incident Management	<ul style="list-style-type: none"> Delayed or ineffective response to CNC-related emergencies such as entrapment, fire, coolant or hydraulic leaks, waterjet failures or uncontrolled movements Inadequate location and visibility of emergency stop devices, fire extinguishers and spill kits around CNC machining areas Lack of specific emergency procedures for incidents involving high speed, waterjet cutting, plasma cutting and electrical faults in CNC control cabinets Poor post-incident investigation and learning processes leading to repeat CNC-related events 	High	[REDACTED]	Medium
16. Contractor and Supplier Management	<ul style="list-style-type: none"> Contractors performing installation, commissioning, maintenance or upgrades on CNC machinery without adequate understanding of site WHS expectations or plant-specific hazards Suppliers configuring CNC controls or robotic systems remotely without appropriate authorisation or risk assessment Inadequate supervision and coordination of multiple contractors 	High	[REDACTED]	Medium

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	working in or around CNC machining areas		[REDACTED]	
17. Monitoring, Auditing and Continuous Improvement	<ul style="list-style-type: none"> • Degradation of CNC safety systems and management controls over time due to lack of monitoring and review • Failure to identify non-compliance with procedures, guarding standards, LOTO or PPE requirements in CNC areas • No systematic analysis of CNC-related incident trends, near misses and maintenance data • Missed opportunities to incorporate technological improvements and industry best practice into CNC safety management 	Medium	[REDACTED]	Low

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.