Boiler Safety			
Business Name:		ABN:	
Business Address:			
Contact Person:	Phone:	Email:	

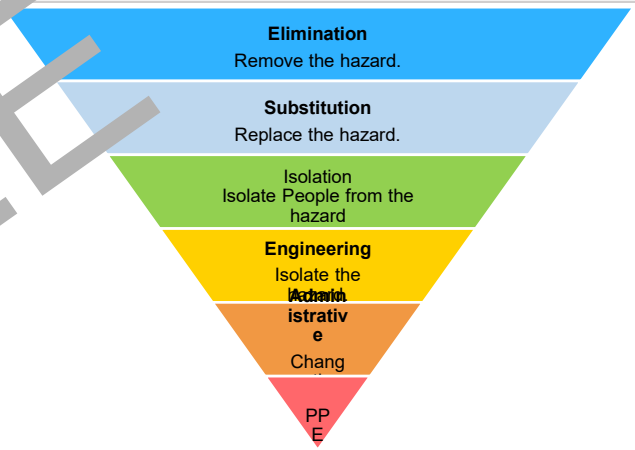
THIS RISK ASSESSMENT IS APPROVED BY THE PCBU OF THE PROJECT		
Under the Work Health and Safety Regulation (WHS Regulation), a person conducting a business or undertaking (PCBU) is required to ensure that a RISK ASSESSMENT is prepared before the proposed work starts.		
Full Name:		
Signature:	Title:	Date:

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
ALMOST CERTAIN	3 HIGH	3 HIGH	4 ACUTE	4 ACUTE	4 ACUTE		
LIKELY	2 MODERATE	3 HIGH	3 HIGH	4 ACUTE	4 ACUTE	4A ACUTE	DO NOT PROCEED
POSSIBLE	1 LOW	2 MODERATE	3 HIGH	4 ACUTE	4 ACUTE	3H HIGH	Rev before work
UNLIKELY	1 LOW	1 LOW	2 MODERATE	3 HIGH	4 ACU	2M MO RATE	Ensure control measures in place.
RARE	1 LOW	1 LOW	2 MODERATE	3 HIGH	3 H	1L LOW	Monitor and keep records.

HIERARCHY OF CONTROLS



Risk Rating & Required Action:

4A	Stop work. The risk is intolerable. E inate the hazar redesign the activity before proceeding. A Safe Work Method Statement (SWMS) or hi er-level authorisati is required.
3H	Review and approve additional c rols b ask arts. Senior supervisor sign-off needed.
2M	Ensure all nominated controls are in ace and effe ive. 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. WHS Governance, Legal Compliance & PCBU Duties	• Lack of clear allocation of WHS duties for boiler ownership, operation and maintenance under WHS Act 2011 and WHS Regulations • Failure to identify boiler as a pressure equipment item requiring registration, inspection and specific controls • Inadequate monitoring of compliance with Australian Standards (e.g. AS 2593, AS 3788, AS 1210, AS 1271) • No systematic process to review changes in legislation, codes of practice and standards relevant to boilers • Confusion over responsibilities between PCBUs (owner, operator, maintenance contractor, host employer) • No documented plant registration or registration of design where required • Inadequate consultation with workers and HSRs regarding boiler risks and changes to systems • Failure to maintain st[illegible]ory records of inspections, tests, a[illegible]erations and repairs	4A	• Establish a documented Boiler Safety Mana[illegible]ent Plan aligned with WHS Act 2011, WHS Regulations and relevant Australian Standards • Formally appoint a person with managemen[illegible] co[illegible]ol of the boiler (Plant Owner) and define PCBU responsibilities in position descriptions and con[illegible]s • Maintain a legal register ide[illegible]ying the boiler as r[illegible]istrab[illegible]plant, including registration status, renewal dates and jurisdiction requireme[illegible] • Implement a re[illegible]atory c[illegible]pliane[illegible]register and scheduled review process (at least annually) to capture and act on ch[illegible]ges to legis[illegible]ion, st[illegible]dards [illegible] codes • Ensure all bo[illegible] designs, alterations a[illegible]repairs are certified by competent engineers and documented to me[illegible]pplicab[illegible]Aus[illegible]lian Standards • Defin[illegible]a[illegible]docum[illegible]t interfaces and responsibilities between multiple PCBUs (e.g. owner, lessee, contrac[illegible]r) in written [illegible]eements and WHS coordination plans • Implen[illegible]t a f[illegible]mal consultation process with workers and HSRs on boiler risks, procedures, incident l[illegible]ings[illegible]nd pr[illegible]osed changes • Maint[illegible]ecure, backed-up records of design registrations, plant registrations, competent person [illegible]orts, pressure test certificates and inspection reports for statutory periods • S[illegible]hedule periodic internal WHS audits of boiler management systems with corrective action tracking and close-out verification	3H
2. Boiler Design, Specification & Procurement	• Selection of boilers [illegible]mponents [illegible]at are not designed to appropriate Australian Standards or site condit[illegible]ns • Inadequate design press[illegible], temperature rating or materials for the intended service • Boilers supplied without essential safety devices (e.g. safety valves, low-water cut-outs, flame failure protection, interlocks) • Inadequate specification of control systems, safety integrity and fail-safe behaviour • Poor consideration of water quality, blowdown requirements and corrosion risks in design	4A	• Mandate that all new boilers and major modifications are designed and manufactured in accordance with relevant Australian Standards (e.g. AS 1210, AS 2593, AS 3788) • Develop standard boiler design and procurement specifications including minimum safety devices, redundancy, control philosophy and safety integrity levels where appropriate • Require third-party engineering verification and design registration (where required) prior to procurement or commissioning • Include functional safety requirements for boiler controls (e.g. flame failure, low-water, over-pressure, over-temperature, lockout logic) in tender documents • Specify materials and design margins suitable for the specific fuel, water/steam quality and operating environment (corrosive, coastal, dusty, explosive atmospheres) • Ensure procurement processes require suppliers to provide full documentation: design calculations, material certificates, pressure test records, P&IDs and operating limits • Include lifecycle cost and maintainability (access platforms, lifting points, isolation valves, sampling points) as formal evaluation criteria, not just purchase cost	2M

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	• Lack of consideration for future maintenance access and safe isolation in design • Procurement decisions based solely on price with insufficient safety and lifecycle assessment • Use of non-certified or counterfeit pressure parts, valves or instrumentation		• Require OEM and critical component vendors to provide compliance declarations, certifications and traceability for pressure parts, safety valves and control instrumentation • Implement a technical review committee (engineering, WHS, operations, maintenance) to approve boiler selection and major upgrades	
3. Plant Layout, Installation & Access	• Inadequate clearances around boilers for inspection, maintenance and emergency access • Poor segregation of boilers from public areas, offices or other high-occupancy spaces • Inadequate ventilation in boiler rooms leading to accumulation of combustion products or fuel gas • Insufficient structural support for boilers, flues and associated pipework • Unsafe location of blowdown discharge, steam vents or safety valve outlets exposing people to hot fluids or noise • Difficult or unsafe access to valves, gauges, burners, economisers • Inadequate lighting, housekeeping and drainage around boiler plant • Poor routing or support of steam, feedwater and fuel lines creating trip, impact or leak hazards	3H	• Develop and enforce a boiler installation standard specifying minimum clearances, access routes, escape paths and exclusion zones based on relevant standards and OEM guidance • Ensure plant layout risk assessments (HAZID/HAZOP) are completed for new installations and significant alterations, involving operations, maintenance and WHS representatives • Provide dedicated boiler rooms or plant areas with controlled access, fire-rated separations and appropriate ventilation designed by a competent engineer • Design and certify structural supports for boilers, platforms, ladders, flues and pipework, including seismic and wind loading where required • Route safety valve discharges, vents and blowdown lines to safe locations with effective dispersal, noise control and thermal shielding, away from routine personnel access • Install compliant access systems (stairs, platforms, handrails) for all operational and maintenance points, avoiding reliance on portable ladders where practicable • Ensure adequate lighting, non-slip flooring, bunding and drainage in boiler areas to manage water, oil and chemical spills • Standardise pipework identification, labelling and colour coding for steam, condensate, fuel, compressed air and water services • Implement a management of change (MOC) process for any pipework rerouting or boiler room modification to preserve safe access and egress	2M
4. Boiler Control Systems, Instrumentation & Interlocks	• Failure or bypassing of critical interlocks (low-water, flame failure, over-pressure, high temperature) • Faulty or poorly calibrated gauges, transmitters and safety devices leading to operation outside safe limits • Single-point failure in control systems with no redundancy for critical protections	4A	[redacted]	2M

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SPECIFIC WORK STEPS	HAZARDS THAT MAY ARISE	INITIAL RISK	SPECIFIC MEASURES TO BE PUT IN PLACE TO ELIMINATE OR CONTROL THE RISKS	RESIDUAL RISK
	• Unauthorised adjustment of setpoints for safety valves, controllers or pressure switches • Use of non-safety-rated PLCs, sensors or actuators for critical safety functions without adequate assessment • Inadequate alarm management leading to alarm flooding, missed critical alarms or operator desensitisation • Lack of protective logic to shut down boiler on loss of utilities (power, air, water, fuel) • Control software changes implemented without testing, documentation or approval		[redacted]	
5. Pressure System Integrity, Inspection & Testing	• Undetected corrosion, erosion, fatigue or cracking in pressure parts leading to rupture or explosion • Inadequate inspection intervals or scope for boilers, valves and pressure piping • Failure of safety relief valves due to corrosion, sticking, incorrect sizing or incorrect setpoint • Lack of accurate records for thickness measurements, repairs and inspection findings • Uncontrolled modifications or welding on pressure components by unqualified personnel • Over-pressurisation due to isolation of safety devices or blocked discharge lines • Failure to remove defective equipment from service in a timely manner • Use of incompatible repair materials or procedures undermining boiler integrity	4A	[redacted]	2M

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SPECIFIC WORK STEPS	HAZARDS THAT MAY ARISE	INITIAL RISK	SPECIFIC MEASURES TO BE PUT IN PLACE TO ELIMINATE OR CONTROL THE RISKS	RESIDUAL RISK
6. Operational Control, Procedures & Supervision	• Lack of clear operating limits and instructions for normal, start-up, shutdown and upset conditions • Reliance on informal practices and undocumented work-arounds by operators • Inadequate supervision or oversight of boiler operations, especially during shifts or after-hours • Operating boiler outside design parameters (pressure, temperature, load, feedwater quality) • Failure to respond appropriately to alarms, interlocks and trip events • Poor communication during shift handover leading to missed issues or unsafe conditions • Inadequate management of temporary operating modes (manual control, bypassed devices, commissioning) • Failure to control access to boiler plan leading to interference [illegible]thorised operations	3H	[redacted]	2M
7. Competency, Licensing, Training & Authorisation	• Operators or maint[illegible] personn lacking required high risk work licen[illegible]s or specific boiler competencies • Inadequate training in em[illegible]gency response, alarm recognition and boiler trip scenarios • Insufficient understanding of underlying boiler hazards (pressure, steam, fuel, water chemistry) • No formal process for authorising individuals to operate or isolate boilers • Failure to ensure contractors are competent and familiar with site-specific systems	3H	[redacted]	2M

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SPECIFIC WORK STEPS	HAZARDS THAT MAY ARISE	INITIAL RISK	SPECIFIC MEASURES TO BE PUT IN PLACE TO ELIMINATE OR CONTROL THE RISKS	RESIDUAL RISK
	• Outdated training materials not reflecting current plant configuration or procedures • Language, literacy or numeracy barriers affecting comprehension of critical information • No refresher training leading to skill fade over time		[redacted]	
8. Water Treatment, Boiler Chemistry & Blowdown Management	• Inadequate water treatment leading to scaling, corrosion, foaming and carryover • Incorrect dosing of treatment chemicals causing accelerated metal loss or unsafe steam quality • Failure to monitor key water chemistry parameters at required frequencies • Uncontrolled manual blowdown causing thermal shock or exposing workers to hot water/steam • Corrosion and leakage in feedwater and condensate systems compromising boiler integrity • Chemical handling and storage risks (spills, incompatible storage, exposure to corrosives) • Inaccurate testing due to poor sampling methods or untrained personnel • Discharge of untreated blowdown or chemicals to the environment in breach of licence conditions	H	[redacted]	2M
9. Fuel Systems, Combustion & Explosion Prevention	• Gas leaks from fuel lines, valves or burners leading to fire or explosion • Fuel oil spills causing fire, environmental and slip hazards • Incomplete combustion producing carbon monoxide and other hazardous gases • Flame failure or delayed ignition causing furnace explosions	4A	[redacted]	2M

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SPECIFIC WORK STEPS	HAZARDS THAT MAY ARISE	INITIAL RISK	SPECIFIC MEASURES TO BE PUT IN PLACE TO ELIMINATE OR CONTROL THE RISKS	RESIDUAL RISK
	• Inadequate purging before start-up or re-ignition after flame failure • Uncontrolled fuel supply due to valve failure, control system fault or manual error • Lack of gas detection, ventilation or emergency shut-off arrangements • Poor maintenance of burners, fuel trains and combustion controls		[redacted]	
10. Routine Maintenance, Inspection & Contractor Management	• Inadequate preventive maintenance scheduling leading to equipment failure and unsafe conditions • Unplanned breakdown maintenance under time pressure increasing risk of error • Maintenance tasks performed without adequate isolation, lockout or depressurisation • Use of unqualified contractors for specialised boiler work • Poor coordination between in-house staff and contractors creating conflicting activities • Failure to reinstate safety devices or remove temporary bypasses after maintenance • Insufficient verification of maintenance quality and documentation before return to service • Maintenance deferrals without formal risk assessment or approval	3H	[redacted]	2M
11. Isolation, Lockout & Stored Energy Management	• Uncontrolled release of pressure, steam, hot water or chemicals during maintenance or inspection • Inadvertent start-up of boilers or ancillary equipment while personnel are working on the system	3H	[redacted]	1L

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SPECIFIC WORK STEPS	HAZARDS THAT MAY ARISE	INITIAL RISK	SPECIFIC MEASURES TO BE PUT IN PLACE TO ELIMINATE OR CONTROL THE RISKS	RESIDUAL RISK
	• Failure to isolate all relevant energy sources (electrical, pneumatic, hydraulic, fuel, steam) • Complex or poorly documented isolation points leading to mis-isolation • Re-pressurisation of lines due to back-feeding or cross-connections • Inadequate verification of zero energy state before commencing work • Multiple work groups working under different assumptions about isolation status		[redacted]	
12. Emergency Preparedness, Response & Incident Management	• Delayed or ineffective response to boiler emergencies (over-pressure, fire, tube failure, gas leak) • Lack of clear emergency shutdown procedures and responsibilities • Inadequate communication and coordination with emergency services • Insufficient emergency equipment (firefighting, PPE, eyewash, spill kits) or poor maintenance of same • Workers not trained to recognise early warning signs of boiler failure • Failure to investigate and learn from boiler incidents and near misses • Confusing or obstructed emergency exits from boiler rooms	3H	[redacted]	2M
13. Documentation, Change Management & Technical Control of Information	• Outdated P&IDs, drawings and manuals leading to incorrect assumptions about plant configuration	3H	[redacted]	2M

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SPECIFIC WORK STEPS	HAZARDS THAT MAY ARISE	INITIAL RISK	SPECIFIC MEASURES TO BE PUT IN PLACE TO ELIMINATE OR CONTROL THE RISKS	RESIDUAL RISK
	• Uncontrolled changes to boiler systems, setpoints or procedures without risk assessment • Loss or misplacement of critical records (inspection reports, test certificates, design data) • Poor version control resulting in workers following superseded procedures • Changes made by contractors not fed into site documentation systems • Lack of visibility of outstanding defects, temporary repairs or operating restrictions		[redacted]	
14. Monitoring, Performance Review & Continuous Improvement	• Failure to detect deteriorating boiler performance indicating emerging safety issues • No structured review of boiler safety performance and leading indicators • Repeat incidents or n[illegible]ses due to ineffective correctiv[illegible]actions • Over-reliance on [illegible]g indicat[illegible]h as lost time injuries wi[illegible]mining process safety metrics • Lack of senior management visi[illegible]y of boiler risks and performa[illegible] • Complacency arising from long periods without major incidents	2M	[redacted]	1L
15. Occupational Health, Environment & Surrounding Workplace Interfaces	• Exposure of workers to excessive noise, radiant heat or hot surfaces around boilers and steam lines • Impact of boiler operation on indoor air quality (combustion products, fumes) • Environmental releases from blowdown, chemical dosing or fuel handling affecting air, soil or water	3H	[redacted]	2M

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SPECIFIC WORK STEPS	HAZARDS THAT MAY ARISE	INITIAL RISK	SPECIFIC MEASURES TO BE PUT IN PLACE TO ELIMINATE OR CONTROL THE RISKS	RESIDUAL RISK
	• Interface risks where boiler plant is adjacent to other processes, public areas or traffic routes • Manual handling and ergonomic strains associated with valve operation, access and component replacement • Inadequate consideration of vulnerable workers, visitors or contractors in boiler vicinity		[redacted]	

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

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-of-codes-of-practice

Northern Territory
Work Health and Safety (National Uniform Legislation) Act 2011
Work Health and Safety (National Uniform Legislation) Regulations 2011
Legislation NT: https://worksafe.nt.gov.au/laws-and-compliance/workplace-safety-laws
Codes of Practice NT: https://worksafe.nt.gov.au/forms-and-resources/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

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.

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

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

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

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