Air Conditioning Refrigerant Handling and Re-Gassing

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:

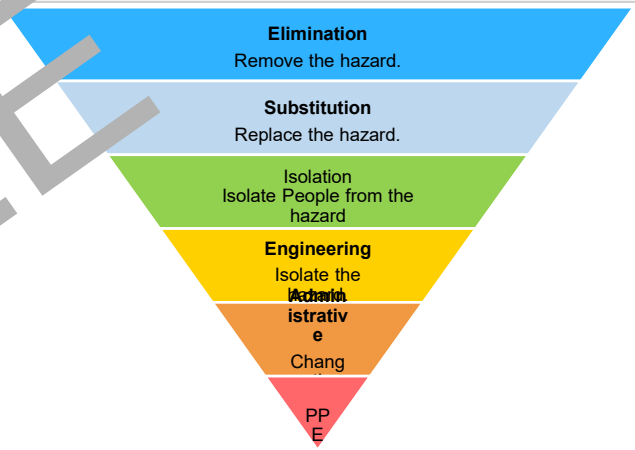
CLIENT OR PRINCIPAL CONTRACTOR DETAILS

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 & Licensing	• Lack of awareness of obligations under WHS Act 2011, WHS Regulation and Ozone Protection and Synthetic Greenhouse Gas legislation • Technicians handling refrigerants without appropriate ARCTick licence or restricted electrical licence where required • No documented WHS policy or organisational commitment to safe refrigerant handling • Inadequate consultation with workers and health and safety representatives on refrigerant risks • Failure to keep up to date with changes in Australian Standards, Codes of Practice and manufacturer requirements • Poorly defined WHS responsibilities for managers, supervisors and technician	4A	• Establish and maintain a documented WHS anagement system that references WHS Act 2011, WHS Regulation, environmental legislation and r vant Austr n Standards for refrigeration and air conditioning • Define and document roles, responsibilities an ccountabilitie or refrigerant handling and air-conditioning service across anagement, supe isors an workers • Implement a legal and licence mpliance register ing ARCTick refrigerant handling licences, electrical permits, h ork li ces (if applicable) and ensure periodic internal audits • Ensure onl ppropriately ensed and com tent personnel are authorised in writing to depressurise systems, flush esets and e-gas air-c ioning units and compact chillers • Dev a WHS nance procedure requiring regular review of legislation, standards and industry guida e, ith upd s communicated to affected workers • Maint n c ent Saf Work Method Statements (SWMS) for high-risk activities that interface with this system- vel r assess ment, and ensure they align with organisational WHS policies	3H
2. Competency, Training & Authorisation of Personnel	• Inadequate competency in refrigeran characteristics, including flammability, toxicity and asphyxiation • Lack of training in e depressurising and re-gassing tec iques for v ous refrigerant types a ore • Insufficient understanding of hazar associated with flushing linesets a servicing compact chiller • No formal verification of competence for new hires or subcontractors • Failure to provide refresher training on new refrigerant technologies (e.g. R32, CO2, low-GWP blends) • Technicians unaware of emergency response procedures in the event of a serious refrigerant leak or exposure	4A	• Develop a competency framework for air-conditioning and refrigeration workers that specifies minimum qualifications, licences and experience for each task category • Implement structured induction and task-specific training programs covering refrigerant properties, system pressures, safe depressurisation, line flushing and re-gassing processes • Use a formal competency assessment and authorisation process (theory and observed practical) before allowing personnel to work unsupervised on live systems • Schedule periodic refresher training and toolbox talks to address new refrigerant types, updated procedures, incident learnings and changes in standards • Maintain a training and competency matrix, ensuring expiry dates and refresher requirements are monitored and actioned • Ensure subcontractors provide documented evidence of competency and licences, verified by the principal contractor or PCBU before being engaged	2M
3. Plant, Equipment & Tooling Management	• Use of uncalibrated or non-compliant gauges, manifolds and pressure testing equipment	4A	• Implement a plant and equipment management procedure covering selection, commissioning, inspection, maintenance and retirement of all refrigerant handling tools and plant	2M

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	• Inadequate maintenance of recovery units, vacuum pumps and re-gassing equipment leading to leaks or failure under pressure • Use of incompatible hoses, fittings or adaptors for specific refrigerant classes • Damaged or poorly maintained compact chillers and service equipment increasing risk of rupture or uncontrolled release • Lack of system for isolating and tagging out defective equipment • Inadequate selection and rating of tools for working in potentially flammable or explosive atmospheres		• Ensure all gauges, recovery units, vacuum pumps and leak detection equipment are calibrated and serviced in accordance with manufacturer instructions and relevant Australian Standards • Standardise approved hose types, fittings and adaptors by refrigerant type and pressure class, and prohibit use of non-approved combinations • Introduce a tagging and isolation process for defective equipment, including prohibition signage, lockout where practicable and documented repair/replacement records • Include refrigerant plant and service tools in a planned preventative maintenance schedule, with records maintained and periodically reviewed by supervisor • Specify intrinsically safe or appropriately rated electrical and electronic equipment where work may involve flammable refrigerants or classified hazardous locations	
4. Refrigerant Storage, Transport & Inventory Control	• Improperly stored refrigerant cylinders leading to falls, impacts or valve damage and subsequent gas release • Inadequate segregation of flammable refrigerants from ignition sources or incompatible substances • Insufficient inventory tracking resulting in unidentified leaks, environmental releases or regulatory breaches • Cylinders transported unsecured in vehicles or utes creating crush and projectile hazards during braking or collision • Poor labelling of cylinders and decanting equipment causing refrigerant mis-identification and incorrect re-gassing • Lack of procedures for managing out-of-date or damaged cylinders and reclaim refrigerant	4A	[redacted]	2M
5. System Design, Selection & Modification Governance	• Poorly designed or modified air-conditioning systems leading to excessive operating pressures or unsuitable refrigerant selection • Inadequate consideration of ventilation and leak dispersion in plant rooms, roof spaces and confined areas	3H	[redacted]	2M

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	• Uncontrolled modifications to compact chillers and associated pipework increasing risk of leaks, corrosion or vibration failures • Lack of engineering review when retrofitting new refrigerants into existing systems not designed for them • Absence of standardised design criteria for isolation valves, pressure relief devices and service ports • Failure to ensure compatibility of oils, seals and materials of construction with selected refrigerants		[redacted]	
6. Procedures for Depressurising, Flushing & Re-Gassing Systems	• Lack of standardised procedures for depressurising air-conditioning systems and compact chillers • Inadequate controls for managing high-pressure releases during connection or disconnection of service hoses • Uncontrolled flushing of linesets leading to liquid slugging, pressure shocks or discharge of c[redacted]inants • Incorrect re-gassi[redacted] processes resulting in over-c[redacted]rging, under-charging or [redacted] of refrigerants • Poor documentation of system changes and refrigerant c[redacted] after service events • Inconsistent leak detection and tightness testing methods following re-gassing or flushing	[redacted]	[redacted]	2M
7. Work Environment, Access & Confined Space Management	• Poor access to rooftop units, plant platforms or ceiling spaces leading to falls, dropped objects or manual handling incidents • Inadequate ventilation in plant rooms, risers or ceiling cavities increasing risk of refrigerant accumulation and asphyxiation	3H	[redacted]	1L

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	• Unrecognised confined spaces where refrigerant could displace oxygen during leaks or depressurisation • Cluttered or poorly lit plant areas contributing to slips, trips and falls while handling heavy cylinders and equipment • Lack of controls for working near edges, fragile roofs or unprotected penetrations when accessing external air-conditioning units • Inadequate management of simultaneous operations (e.g. other trades, hot works) increasing ignition or interference risks		[redacted]	
8. Atmospheric Monitoring, Leak Detection & Ventilation Controls	• Delayed detection of refrigerant leaks in plant rooms, service corridors or enclosed spaces • Absence of fixed gas detection for high-risk installations such as compact chillers in confined plant rooms • Inappropriate placement or calibration of gas detectors resulting in undetected leaks • Reliance on smell / visible signs to identify refrigerant leaks, particularly for odourless gases • Inadequate testing of ventilation systems that are relied upon for dilution and removal of leaked refrigerant • Lack of integration between leak detection, alarms and emergency response procedures		[redacted]	1L
9. Emergency Preparedness, Response & First Aid	• Lack of clear procedures for responding to significant refrigerant leaks, rapid depressurisation or cylinder failure • Workers untrained in recognising signs of asphyxiation, cold burns or chemical exposure from refrigerants • Insufficient first aid resources or eyewash facilities in areas where	3H	[redacted]	1L

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	refrigerant lines are opened or cylinders are handled • Delayed notification of emergency services during a serious leak or plant failure • Poor coordination with building management, fire wardens and emergency control organisation for refrigerant-related incidents • No post-incident investigation process, leading to repeated failures and unaddressed root causes		[redacted]	
10. Contractor Management & Supervision	• Use of external contractors who do not adhere to the organisation's refrigerant safety standards • Inadequate verification of contractor licences, insurances and competencies • Poor coordination between multiple contractors working on interconnected air-conditioning and chiller systems • Lack of supervision or monitoring of contractor work practices, particularly for depressurising and purging tasks • Failure to communicate site-specific hazards, emergency procedures and permit requirements to contractors • Contractors bypassing organisational procedures to save time	3H	[redacted]	2M
11. Maintenance, Inspection & Asset Integrity of AC Systems	• Lack of systematic inspection and maintenance of refrigerant pipework, valves and joints leading to undetected deterioration • Corrosion, vibration or mechanical damage to compact chillers and outdoor units increasing risk of leaks or rupture • Inadequate verification of safety devices such as pressure relief valves and isolation valves	3H	[redacted]	2M

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	• Deferred or reactive maintenance practices allowing minor leaks or defects to escalate • No documented criteria for decommissioning or major overhaul of ageing air-conditioning plant • Poor record keeping of inspections, repairs and refrigerant additions, limiting the ability to identify systemic problems		[redacted]	
12. Health Monitoring, Exposure Management & PPE Policy	• Unrecognised chronic or repeated low-level exposure to refrigerant gases in poorly ventilated work areas • Inadequate guidance on selection and use of personal protective equipment for handling refrigerants and cold surfaces • Workers not reporting early symptoms of exposure, cold burns or respiratory irritation • No structured process to review health impacts following significant leak incidents or near misses • Inconsistent application of PPE requirements between [redacted] and supervisors • Reliance on PPE [redacted] rather than supporting engineering and administrative measures	2M	[redacted]	1L
13. Documentation, Records, Data & Change Management	• Incomplete or outdated documentation for air-conditioning systems, refrigerant types and charge quantities • Loss of service records hindering traceability of leaks, repairs and re-gassing activities • Poor control of procedures, SWMS and technical documents leading to use of superseded information • Unmanaged changes to plant, refrigerants or procedures increasing the risk of incompatible practices or equipment	3H	[redacted]	1L

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	• Lack of centralised data to analyse refrigerant loss rates and identify systemic issues • Inadequate retention of records needed to demonstrate compliance with WHS and environmental legislation		[redacted]	
14. Consultation, Communication & Worker Engagement	• Workers not consulted about practical issues and risks associated with refrigerant handling and AC servicing • Poor communication of changes to procedures, equipment or refrigerant types • Language or literacy barriers leading to misunderstanding of safety information and instructions • Lack of involvement of health and safety representatives in reviewing refrigerant-related incidents and controls • Informal workarounds and undocumented practices developing without management knowledge • Inconsistent messaging from supervisors regarding [redacted] tolerance and rule enforcement	2M	[redacted]	1L

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