



Confined Space Entry Critical Risk Standard

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1. PURPOSE

PMNZ recognises that Confined Space hazards can result in injury or death resulting from entrapment, asphyxiation, poisoning, fire/explosion or engulfment. PMNZ has a limited number of confined spaces and carries out infrequent entry to them as part of its operations but recognises it is a critical risk even in those limited manifestations. The purpose of this Standard is to manage the health and safety risks associated with confined space entry.

2. SCOPE

This standard applies to all PMNZ sites and operations. If PMNZ is involved in any Project requiring confined space entry, managed by any third party, PMNZ will ensure that the standards and policies of the controlling PCBU are consistent with those of PMNZ. PMNZ will consult, communicate, and coordinate with other PCBUs and stakeholders as required to ensure that standards are maintained, and appropriate due diligence exercised.

3. AUTHORITIES AND RESPONSIBILITIES

Role	Responsibilities
The Company (PCBU) & Officers	The PCBU & Officers of PMNZ have a responsibility to: <ul style="list-style-type: none">▪ Exercise due diligence to ensure all duties and obligations under HSWA 2015 are met including eliminating/minimising risks to health & safety so far as is reasonably practicable.
Critical Risk Sponsors (SLT)	Critical Risk Sponsors are responsible for: <ul style="list-style-type: none">▪ ensuring the requirements of this standard are adhered to.▪ ensuring that adequate resources are available to ensure the full implementation of this standard.
Critical Risk Owner	The Critical Risk Owner is responsible for: <ul style="list-style-type: none">▪ ensuring this standard is implemented, kept up to date, and reported on.▪ providing coaching to managers as required.
Managers	Managers have a responsibility to: <ul style="list-style-type: none">▪ ensure the requirements of this standard are met within their area of responsibility
Workers	Workers have a responsibility to: <ul style="list-style-type: none">▪ ensure the requirements of this Standard are applied where relevant to their roles.▪ Operate safely and seek further information and advice if they do not believe they are competent to do so.

4. CONFINED SPACE ENTRY PROCESS SUMMARY

There are a number of processes involved in managing confined spaces and confined space entry. Examples of how these processes can be managed are detailed below with links to process flowcharts and references to provide further detail. Variations on these processes may also be used to control the risk 'so far as is reasonably practicable'.

Process	Description										
Identification of Confined Spaces	There is a process to determining whether or not any space is a "confined space". This is based on certain criteria (refer definition in section 5.2)										
Confined Space Entry	<p>There is a detailed process to plan to safely enter a confined space. A simple way to remember the key phases of the process is "SPACE". All five phases are mandatory for CS entry.</p> <table border="1"> <tr> <td>S</td><td>SCOPE THE JOB: Is there a better way to do this job (to avoid entry)? No? Then carefully think about and plan your confined space entry. What do you need, how can this entry be done safely?</td></tr> <tr> <td>P</td><td>PERMIT: Complete permit and get signed off.</td></tr> <tr> <td>A</td><td>ACCESS/EGRESS: Environment is safe to enter. Locate and check PPE for safe entry. Ensure you have all the correct gear or wait until you do.</td></tr> <tr> <td>C</td><td>CONTINUOUSLY MONITOR CONDITIONS: A standby person must continuously monitor safety. If in doubt get out.</td></tr> <tr> <td>E</td><td>EMERGENCY PREPAREDNESS: Be prepared for all emergencies. Plans have been tested. Follow the emergency/rescue plan if safety is at risk.</td></tr> </table>	S	SCOPE THE JOB: Is there a better way to do this job (to avoid entry)? No? Then carefully think about and plan your confined space entry. What do you need, how can this entry be done safely?	P	PERMIT: Complete permit and get signed off.	A	ACCESS/EGRESS: Environment is safe to enter. Locate and check PPE for safe entry. Ensure you have all the correct gear or wait until you do.	C	CONTINUOUSLY MONITOR CONDITIONS: A standby person must continuously monitor safety. If in doubt get out.	E	EMERGENCY PREPAREDNESS: Be prepared for all emergencies. Plans have been tested. Follow the emergency/rescue plan if safety is at risk.
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E	EMERGENCY PREPAREDNESS: Be prepared for all emergencies. Plans have been tested. Follow the emergency/rescue plan if safety is at risk.										
Confined Space Permit	The PMNZ Permit to Work is the mechanism by which a CSE Permit is issued.										
Confined Space Emergency Response	When an emergency response is required, fast action is critically important. This process identifies key steps to take in an emergency.										

5. CONFINED SPACE REQUIREMENTS

5.1 GENERAL REQUIREMENTS

The following sets out general minimum requirements and/or principles for the control of risks associated with confined space entry:

- Confined Space Entry work must be avoided where possible. Alternatives must be considered.
- All confined space entry work shall comply with AS 2865:2009 Confined Spaces.
- Where confined space entry is required, a Confined Space Entry Permit is mandatory.

5.2 CONFINED SPACE IDENTIFICATION

A confined space is defined as:

An enclosed or partially enclosed space that is not intended or designed primarily for human occupancy, within which there is a risk of one or more of the following:

- An oxygen concentration outside the safe oxygen range
- A concentration of airborne contaminant that may cause impairment, loss of consciousness or asphyxiation.
- A concentration of flammable airborne contaminant that may cause injury from fire or explosion.
- Engulfment in a stored free flowing solid or a rising level of liquid that may cause suffocation or drowning.

A confined space is determined by the structure and resultant conditions of the space. Manhole risers or tank sumps, all underground and aboveground tanks and vessels, pits, tank vaults, sewers and storm water systems, any water or waste handling systems large enough for human entry, bilge and void spaces on vessels are all examples of confined spaces.

Entry to a confined space is considered to have occurred when a person's head or upper body enters the space.

5.3 PMNZ CONFINED SPACES

PMNZ does not have many confined spaces within its operations. The following are confined spaces at PMNZ:

- Bilge and void spaces on vessels
- Ship holds
- Fuel and water tanks on PMNZ vessels
- Utility manholes and similar underground spaces
- Contamination Separator (Waikawa Hardstand)
- Lady Bridget Barge (Ferry Link span pontoon)

5.4 HAZARDS IN THE CONFINED SPACE

The following list includes but is not limited to, types of hazards that must be considered before entering a confined space:

- Oxygen deficiency (by combustion or oxidation/rust etc., by dilution of air with contaminants or absorption)
- Oxygen enriched atmosphere which increases the risk of fire or explosion
- Contaminants (by decomposition, or biological hazards, welding, release by tools, hazardous substances exposure or any contaminant producing work practices)
- Mechanical Hazards and operation of equipment within a confined space trapping or crushing workers
- Drowning by accidental flooding (engulfment)
- Suffocation or crushing by solids (engulfment)
- Explosion, fire
- Asphyxiation or Inhalation of toxic fumes
- Electrical hazards
- Noise
- Working at heights
- Manual handling
- Slips, trips and falls
- Environment aspects i.e. lighting and temperature
- Task related hazards i.e. hot work
- Restricted entry or exit
- Hazardous services that require isolation

These hazards must be considered and assessed if present when working through the SWMS as part of the permitting process prior to entry.

5.5 HAZARDS OUTSIDE THE CONFINED SPACES

Where the confined space has a vertical opening, there is a risk that people could fall in.

Work done outside the space, but near openings to it, can contaminate the atmosphere inside the space. A common example is the exhaust gases from an internal combustion engine. There may also be potential for fire or explosion where hot work is done in areas next to confined spaces that contain flammable atmospheres.

5.5.1 TRAFFIC

Traffic hazards are a concern where confined space entrances or exits are located on footpaths or roads. There is the potential for workers entering or exiting the space to be struck and injured by vehicle traffic. Where this hazard exists, a Traffic Management Plan must be developed and approved by the Permit Issuer.

5.5.2 ADDITIONAL PHYSIOLOGICAL AND PSYCHOLOGICAL DEMANDS

Working in a confined space may impose additional physiological and psychological demands over and above those encountered in a normal working environment. Consideration should be given to a worker's:

- Physical ability
- Ability to work in a restrictive space (for example claustrophobia)
- Ability to wear the personal protective equipment required to do the work (for example respirators)

5.6 MANAGING ACCESS TO CONFINED SPACES

5.6.1 CONFINED SPACE REGISTER

PMNZ will maintain a Confined Space Register that identifies types of confined spaces identified across its operations, and the hazards associated with those spaces. Every area where confined space hazards have been identified shall add any local considerations into this Register.

5.6.2 VISUAL WARNINGS (SIGNAGE) AND SECURITY

All entry points to a confined space must be sign posted and secured to prevent entry by unauthorised personnel wherever possible. The warning signs should indicate that only authorised access is permitted. An example is shown below.



Figure 1. Example of Confined Space warning signage

5.7 CONFINED SPACE ENTRY PLANNING

In planning entry into a confined space, all relevant matters must be considered, including:

- Whether the work can be carried out without the need to enter the confined space
- The nature of the confined space – its hazards
- How the entry will be managed safely
- The work to be carried out in the confined space, the range of methods by which the work can be carried out and the proposed method to complete the task/s safely
- Safe Work Method Statement and Permit to Work
- Confined space entry rescue plan

5.8 COMMUNICATION AND SAFETY MONITORING – SAFETY OBSERVER

A Safety Observer must be in place to ensure:

- Continuous communication with workers in the confined space
- Monitoring conditions within the confined space
- Immediate notification to responders in the event of an emergency

Depending on the conditions in the confined space, communication can be achieved by voice, radio, hand signals or other suitable methods. The Safety Observer must:

- Understand the nature of the hazards inside the confined space and be able to recognise signs and symptoms that workers in the confined space may experience because of this
- Remain outside the confined space and do no other work which may interfere with their primary role of monitoring the workers inside the space
- Have all required rescue equipment (for example, safety harnesses, lifting equipment, a lifeline) immediately available including means to communicate with persons inside the confined space and emergency services and others in the event of an emergency
- Have the authority to order workers to exit the space if any hazardous situation arises
- Never enter the space to attempt rescue.

5.9 PERMIT TO WORK

Prior to entry into a confined space a Confined Space Entry Permit must be obtained from PMNZ.

The Confined Space Entry Permit can be issued for only one confined space entry. The Confined Space Entry Permit will not be authorised until:

- A Safe Work Method Statement has been completed.
- Measures to control the identified risks have been established.
- The competency of those required to enter the space has been verified.
- Emergency procedures have been determined and are in place.
- There is provision of a Safety Observer/s.
- All potentially hazardous services have been isolated.

The Confined Space Entry Permit must be provided to the person responsible for direct control of the work and kept on prominent display at the confined space (this is usually where the Safety Observer is located).

The information and risk control measures listed on the Confined Space Entry Permit must be reconfirmed whenever it becomes evident that the duration of the task will involve a change of the person to whom the entry authority was issued or a break in continuity of the tasks that may have changed the conditions under which the entry permit was issued.

Where hot work is to be carried out in the confined space, a Hot Work Certificate must also be issued (under the PMNZ Permit to Work system)

5.10 SAFE ATMOSPHERE

A safe atmosphere must be ensured where possible during work in a confined space. A safe atmosphere in a confined space is one that:

1. Has a safe oxygen level (between 19.5% and 23.5%)
2. Is free from airborne contaminants or contains airborne contaminants below their allowable workplace exposure standard - WES (i.e. gas, vapours, fumes, or dusts)
3. Any flammable gas or vapour in the atmosphere is at concentrations below 5% of its lower explosive limit (LEL).

A safe atmosphere can be achieved within the confined space using methods such as cleaning, purging and ventilation.

Where a safe atmosphere cannot be achieved on points 1 and 2 above entry under self-contained or supplied air breathing apparatus may be considered.

Where a safe atmosphere can't be achieved on point 3 no entry is to be carried out.

A safe atmosphere will be checked immediately prior to any entry or re-entry of the confined space. The atmosphere will then be continuously monitored for the period that people are in the confined space, to confirm a safe atmosphere as defined above is maintained. PMNZ Maintains two gas detectors made available to Marine, and Infrastructure teams as required.

No cylinder of compressed or liquefied gas is to be taken into a confined space except for those cylinders used with self-contained breathing apparatus. Hoses supplying gas-operated equipment used in a confined space must be located, suspended or otherwise guarded to avoid accidental damage. Hoses must be tested for leaks prior to use in a confined space.

Only trained and authorised gas testers are permitted to carry out atmospheric testing of a confined space.

5.11 VENTILATION

Ventilation of a confined space with fresh air, by natural, forced or mechanical means, may be necessary to establish and maintain a safe atmosphere and temperature for as long as anyone is in the confined space. Atmospheric testing should be carried out before entry to check that the ventilation has been effective.

Any airborne contaminants removed from the confined space should only be exhausted to the atmosphere at a location where they do not represent a risk. Combustion engines providing power for any use associated with the task being conducted in the confined space should be located so that their exhaust emissions cannot enter the confined space or contaminate air being supplied to the confined space.

Where the maintenance of the atmosphere in the confined space is dependent on mechanical ventilation equipment, the equipment must be continuously monitored while the confined space is occupied.

5.12 ISOLATION REQUIREMENTS

Prior to any person entering a confined space, all potentially hazardous services normally connected to the space will, where it is possible to do so, must be isolated in order to prevent:

- The introduction of any materials, contaminants, agents, or conditions harmful to persons occupying the confined space: and
- The activation or energising in any way of equipment or services that could pose a risk to the health or safety of persons within the confined space.

5.13 EMERGENCY RESPONSE PLAN

Appropriate emergency response procedures and provisions shall be identified, planned, established and rehearsed. Confined Space Entry Permit Receivers must ensure that rescue procedures are communicated to workers prior to entry.

When developing emergency plans consideration must be given to the following:

- Evacuation or self-rescue situations
- Incidents with moderate injury where the person is evacuated but requires first aid or medical treatment outside the confined space.
- Incidents where entry by first aiders is necessary to treat injured person before removal from the confined space.
- Incidents where assistance is required from outside to rescue the person(s) from the confined space.
- Incidents requiring the rescue team to enter the confined space to rescue the person(s) within the space.
- Identification and control of hazards generated by the rescue process.
- The nature of the confined space
- Any hazards associated with the level (or any change in the level) of oxygen and/or atmospheric contaminants.
- The work to be done and the work method including equipment required to undertake the work.
- Work done outside the confined space.
- Means of entry and exit.
- The location of the confined space.
- Means of communication.
- Rescue and resuscitation equipment & capabilities of rescuers.
- First aid & fire suppression equipment.
- Local emergency services.
- Rehearsal.

In a confined space emergency, the spontaneous reaction to immediately enter and attempt to rescue a person from a confined space could lead to the death or serious injury of those attempting the rescue. All persons who might be involved in any way with emergency response associated with a confined space should be made aware that emergency response plans are to be always followed.

6. TRAINING & COMPETENCY

All people involved in the planning, permitting, entry, working, and monitoring of a confined space entry must have the skills and knowledge to understand the hazards associated with working in the confined space, confined space entry permit requirements, and the control measures implemented for their protection.

Appropriate training must be provided to workers who:

- Enter or work in confined spaces.
- Undertake hazard identification or risk assessment in relation to a confined space.
- Implement risk control measures.
- Issue confined space entry permits.
- Receive confined space entry permits.
- Act as a Safety Observers

All persons with work activities related to a confined space shall be trained and assessed as competent to perform those activities. The following sets out minimum training requirements:

Permit Issuers	PMNZ Permit to Work system/issuers training. Risk management Reviewing SSOW Plan Confined Space Entry (US 17599)
Permit Receiver	PMNZ Permit to Work system/receivers training. Plan Confined Space Entry (US 17599)
Permit Users/Confined Space Entrants	Risk Management SSOW Plan Confined Space Entry (US 17599) Confined space (NZQA 18426)
Safety Observer	Safety Observer (NZQA 17596 or equivalent)
Gas Tester	Gas testing (NZQA 25510)

All trained persons must have their competency reassessed every two years.

In addition, those involved in confined space entry must also be trained in, and conversant with the relevant (to them) provisions of this PMNZ Confined Space Entry Standard. As a minimum these will be addressed in Induction programmes with a reference to this Standard.

7. MONITORING AND REVIEW OF APPLICATION

Monitoring and review of application of this standard will be performed on a regular basis. The frequency of these will be dictated by the nature of the confined space entry and associated

activity. The PMNZ Permit to Work System and Permit Issuer will determine the nature and frequency of this.

8. ASSOCIATED DOCUMENTS

- PMNZ Critical Risk Management Framework
- PMNZ Hazard and Risk Management Procedure
- PMNZ Permit to Work Procedure
- PMNZ Health and Safety Management System (HSMS)

9. REFERENCES

9.1 RELEVANT LEGISLATION

Legislation available at <http://www.legislation.govt.nz>

- Health and Safety at Work Act 2015
- Health and Safety at Work (General Risk and Workplace Management) Regulations 2016
- Health and Safety at Work (Worker Engagement, Participation and Representation) Regulations 2016
- Health and Safety at Work (Major Hazard Facilities) Regulations 2016
- Health and Safety at Work (Hazardous Substances) Regulations 2017

9.2 OTHER DOCUMENTS

- AS 2865:2009 Safe Working in a Confined Space (accepted as Best Practice standard by WorkSafe) <https://infostore.saiglobal.com/store/details.aspx?ProductID=1137140>
- AS/NZS 1891.4:2009 Industrial fall-arrest systems, selection, use and maintenance
- AS/NZS 1715:2009 Selection, use and maintenance of respiratory protective equipment
- AS/NZS 1716:2012 Respiratory protective devices
- AS/NZS 1319:1994 Safety signs for the occupational environment
- Workplace Exposure Standards and Biological Exposure Indices (latest version June 2016) <http://www.worksafe.govt.nz/worksafe/information-guidance/all-guidance-items/workplace-exposure-standards-and-biological-exposure-indices>

10. DEFINITIONS & ABBREVIATIONS

Term	Definition
Atmospheric Monitoring	The continuous measurement of oxygen concentration or airborne contaminants over an uninterrupted period of time.

Confined Space	<p>An enclosed or partially enclosed space that is not intended or designed primarily for human occupancy, within which there is a risk of one or more of the following:</p> <ul style="list-style-type: none"> ▪ An oxygen concentration outside the safe oxygen range ▪ A concentration of airborne contaminant that may cause impairment, loss of consciousness or asphyxiation ▪ A concentration of flammable airborne contaminant that may cause injury from fire or explosion ▪ Engulfment in a stored free flowing solid or a rising level of liquid that may cause suffocation or drowning
Engulfment	The immersion or envelopment of a person by a solid or rising level of liquid in a confined space.
Entry (into a confined space)	When a person's head or upper body is within the boundary of the confined space.
Hot Work	Welding, thermal or oxygen cutting, heating, including fire-producing or spark-producing operations that may initiate/ignite a fire or explosion.
Lower Explosive Limit (LEL)	The concentration of a flammable contaminant in air below which the propagation of a flame does not occur on contact with an ignition source.
Purging	The method by which any contaminant is displaced from a confined space. Purging may be accomplished by forcing air, water or another substance into a confined space to push the hazardous substance out.
Safe Atmosphere	<p>A safe atmosphere in a confined space is one that:</p> <p>Has a safe oxygen level (between 19.5% and 23.5%)</p> <p>Is free from airborne contaminants or contains airborne contaminants below their allowable exposure standard (i.e. gas, vapours, fumes or dusts)</p> <p>Any flammable gas or vapour in the atmosphere is at concentrations below 5% of its LEL.</p>
Safe Oxygen Range	A concentration of oxygen in the atmosphere having a minimum of 19.5% by volume and a maximum of 23.5% by volume, under normal atmospheric conditions.
Safety Observer	A competent person assigned to remain on the outside of, and in close proximity to, the confined space and capable of being in continuous communication with and, if practical, to observe those inside. In addition, where necessary, the competent person may operate and monitor equipment for the safety of personnel in the confined space and initiate emergency response.

Upper Explosive Limit	The concentration of a flammable contaminant in air above which the propagation of a flame does not occur on contact with an ignition source.
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11. REVIEW

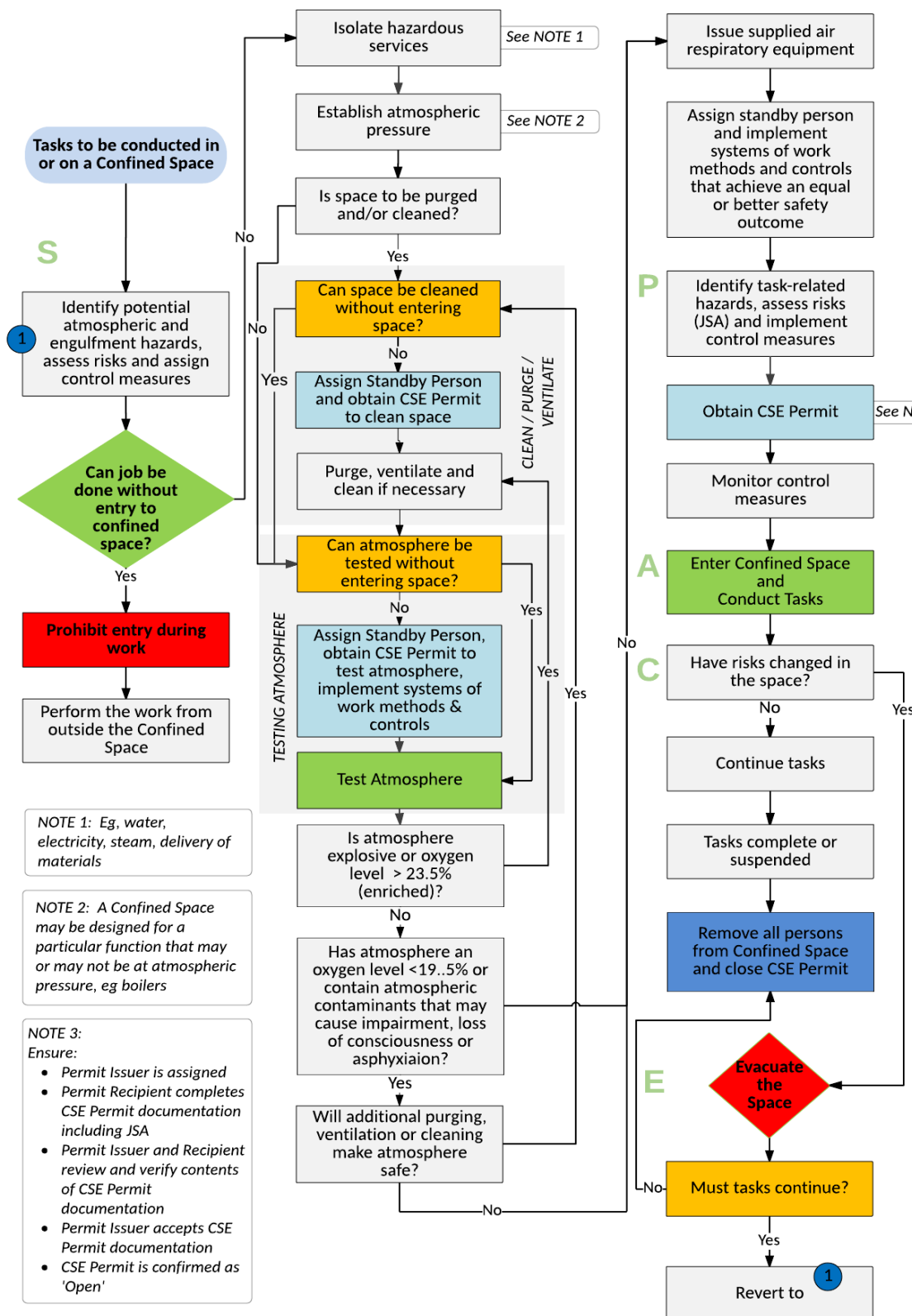
This document will be reviewed every two years or after any critical event associated with it. The Review will be performed by the Critical Risk Owner in consultation with key stakeholders, and any changes agreed by the Critical Risk Panel.

12. REVISION HISTORY

Version	Date	Brief Description of Changes	Owner
V001	27/02/2024	New Document	GM-HSW

13. APPENDICES – CONFINED SPACE ENTRY FLOWCHART

Confined Space Entry



APPENDICES – CONFINED SPACE ENTRY EMERGENCY RESPONSE

Confined Space Entry Emergency Response

