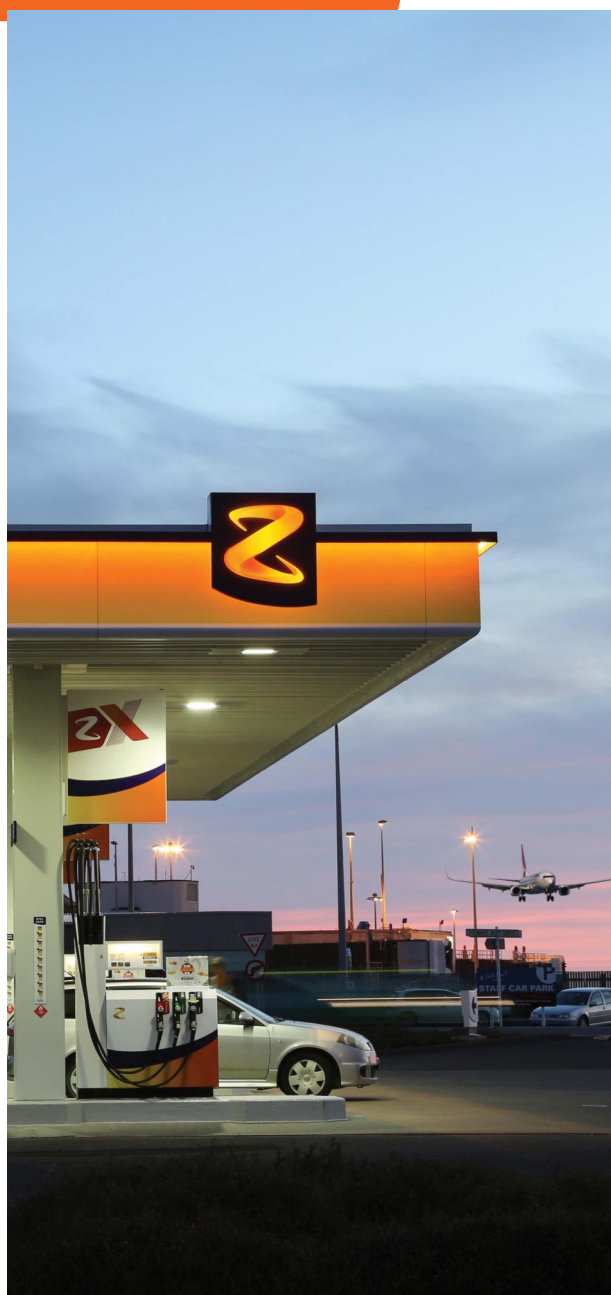


# Safe Work Practice Confined Space - Z Energy

HS-IOA-GUI-012

ZORM  
IN ACTION



## Revision Summary

Version	Author	Reasons for Change	Approver	Date Approved
1.0	M Imamura	New document	M Guantero	15 Aug 2018
2.0	R Josol	Review and update from Control V&V requirement	M Guantero	March 2023
3.0	G Knox	General Review. Reviewed and updated by SPI group. Addition of Leaded or Previously leaded tank section entry (section 6)	A Shand	30 May 2025

Electronically Controlled Document. Refer to online document for current version.

Custodian: Graham Knox	Owner: Head of Safety, Wellbeing & Risk	Document No.: CD21447	Page: 1 of 15
Approved: 29/05/2025	Published: [Published Date]	Periodic Due Date: 26/11/2029	Version: 1

Legacy ID: HS-IOA-GUI-012



Division	Z Energy
Type	Safe Work Practice
Title	<b>Safe Work Practice Confined Space - Z Energy</b>

## 1. Purpose and Scope

WorkSafe New Zealand accepts AS 2865 Confined spaces as the current state of knowledge on confined space entry work. This document provides guidance on how Z applies the requirements in the standard when performing work that involves confined space entry.

### What does the standard require?

The standard follows the approach of the Health and Safety at Work Act 2015 (HSWA). It requires persons conducting a business or undertaking (PCBUs) to:

- identify the hazards associated with working in the confined space and conduct a risk assessment
- control the risks posed by the hazards by:
  - elimination
  - minimisation, if elimination isn't reasonably practicable.

## 2. Confined Space

A confined space:

- 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.

Enclosed or partially enclosed spaces that may meet the definition criteria for a Confined Space are -

- storage tanks, tank cars, process vessels, boilers, pressure vessels, silos and other tank-like compartments,
- pipes, sewers, shafts, degreasers and sullage pits, ducts and similar structures, and
- any shipboard spaces entered through a small hatchway or entry point, cargo tanks, cellular double bottom tanks, duct keels, ballast and oil tanks, and void spaces.

Tank Bunds are usually subject to good ventilation. If an accumulation of hydrocarbon or toxic vapours is suspected in any bund, and the ventilation is considered not adequate at the time, then a Confined Space Entry Certificate should be issued at the discretion of the Permit Issuer.

Excavations may present many of the hazards associated with confined spaces. This is true whether they meet the regulatory definition of a confined space or are only partially enclosed. Work permit issuers should consider every excavation as a potential confined space. Doing so may trigger additional process and equipment requirements that will help prevent incidents.

Electronically Controlled Document. Refer to online document for current version.			
Custodian: Graham Knox	Owner: Head of Safety, Wellbeing & Risk	Document No.: CD21447	Page: 2 of 15
Approved: 29/05/2025	Published: [Published Date]	Periodic Due Date: 26/11/2029	Version: 1



<b>Division</b>	Z Energy
<b>Type</b>	Safe Work Practice
<b>Title</b>	<b>Safe Work Practice Confined Space - Z Energy</b>

## 2.1. Restricted means of entry or exit

A Confined Space may or may not have restricted means of entry and exit. Appropriately sized entry and exit points are important for the safe entry and exit or retrieval of a person(s) in an emergency. However, a restricted means of entry or exit is not a consideration in identifying an enclosed or partially enclosed space as a Confined Space.

## 2.2. Human occupancy

Most enclosed or partially enclosed spaces are intended or designed primarily for human occupancy, e.g. offices and workshops where adequate ventilation and lighting, safe means of access and egress, etc. are provided. From time to time, they may have atmospheric hazards produced by task-related activities such as welding. Such task-related hazards are not covered by this standard and other safety systems apply.

## 2.3. Atmospheric contaminants

Some enclosed or partially enclosed spaces have atmospheric contaminants that are harmful to persons but are designed for persons to occupy, e.g. abrasive blasting or spray-painting booths. Enclosed or partially enclosed spaces that are intended or designed primarily for human occupation and have systems such as gaseous fire extinguishing systems (see AS 4214) or inert gas systems for beverage dispensing (see AS 5034) installed, are not Confined Spaces. In such cases, other safety systems such as relevant legislation, Standards or Codes of Practice apply.

## 2.4. Engulfment

A rising level of liquid (or solid) in an enclosed or partially enclosed space may cause engulfment through the inability of a person to readily exit the space. Drowning in a reservoir, dam or tank where the level of liquid is static is not considered to be drowning from engulfment.

# 3. Confined Space Entry

For purposes of this document, a person whose head, i.e. the breathing zone, or upper body, is within a Confined Space is considered to have entered the confined space. (As per AS/NZS 2865: 2009 Confined Spaces – Section 1.5.8).

All Confined Space Entries shall have a Rescue Plan developed and rehearsed prior to commencement of work.

Personnel responsible for issuing confined space entry permit(s) must be suitably trained, tested, and hold current certificate(s) of competency.

## 3.1. Excavation

Where an excavation is considered to be a Confined Space, then the guidelines applicable to working in a confined space shall be followed. When entry into an excavation is required, Confined Space procedures need to be applied – this will include pre-entry, continuous atmospheric testing, and provision for rescue plan including retrieval methods for conceivable events.

Electronically Controlled Document. Refer to online document for current version.			
<b>Custodian:</b> Graham Knox	<b>Owner:</b> Head of Safety, Wellbeing & Risk	<b>Document No.:</b> CD21447	<b>Page:</b> 3 of 15
<b>Approved:</b> 29/05/2025	<b>Published:</b> [Published Date]	<b>Periodic Due Date:</b> 26/11/2029	<b>Version:</b> 1



Division	Z Energy
Type	Safe Work Practice
Title	Safe Work Practice Confined Space - Z Energy

All work involving excavation on site shall require the completion of the Excavation Certificate as per Excavation Safe Work Practice. This is required even if the work to be performed is not in a designated "Hazardous Area".

### 3.2. Entry under a Wharf

If assessed as not fitting the definition of a Confined Space, entry under a wharf may be authorised under a Cold or Hot Work permit as appropriate, with any additional controls documented as part of the HITRA process. A Work Permit is not required if activity is conducted under a Standard Operating Procedure (SOP).

Expected controls may include but not limited too; Personal Flootation Devices (PFD's), means of communication, rescue plan, safety watch.

## 4. Applicability

This document applies to all persons working for and on behalf of Z or its subsidiaries, i.e. employees, contractors, sub-contractors, franchisees, and retail site staff, as well as visitors and other third parties on premises operated by Z or its subsidiaries.

Compliance shall be the responsibility of all employees, contractor, retailer and retail site staff or 3rd party working for or on a Z area of business. This is a Z document, and adherence is not required in any area controlled exclusively by another third party.

This document takes precedence only where its requirements exceed those of applicable laws and regulatory requirements.

All applicable laws and regulations shall be complied with when performing any work, either within or beyond the scope of this document.

## 5. Hazards

### Applicable LifeSavers



Electronically Controlled Document. Refer to online document for current version.			
Custodian: Graham Knox	Owner: Head of Safety, Wellbeing & Risk	Document No.: CD21447	Page: 4 of 15
Approved: 29/05/2025	Published: [Published Date]	Periodic Due Date: 26/11/2029	Version: 1



<b>Division</b>	Z Energy
<b>Type</b>	Safe Work Practice
<b>Title</b>	<b>Safe Work Practice Confined Space - Z Energy</b>

## 6. References

### 6.1. External References

- Health and Safety at Work Act 2015
- WorkSafe Guide to Confined spaces: planning entry and working safely in a confined space ([Planning entry and working safely in a confined space | WorkSafe](#))
- Australian Standard: AS 2865 Confined spaces
- API 2015-2001 Requirements for safe entry and cleaning of petroleum storage tanks

### 6.2. ZORM Documents

- Z's Approach to managing operational risks
- Z's Approach to managing operational integrity
- Z's Permit to Work Manual
- Z's Drug and Alcohol Policy
- Managing fatigue at Z - QRG
- PPE Matrix - QRG
- PPE Specifications – QRG
- Confined Space Entry certificate

## 7. Roles and Responsibilities

Role	Responsibility/Accountability
<b>General Manager-BU</b>	<ul style="list-style-type: none"> <li>• Ensure business unit compliance to this procedure.</li> </ul>
<b>Control of Work &amp; PCBU Specialist</b>	<ul style="list-style-type: none"> <li>• Responsible for maintaining and confirming the implementation of this procedure</li> </ul>
<b>Senior Permit Issuer</b>	<ul style="list-style-type: none"> <li>• Ensure any tasks that involves working at heights is managed under the Z Permit to Work System (PTW)</li> </ul>
<b>Permit Issuer</b>	<ul style="list-style-type: none"> <li>• Confirm that the hazards associated with the confined space entry have been identified and assessed and that the identified controls are adequate to perform the work in a safe and environmentally-sound manner prior to authorising and issuing the Permit to Work</li> </ul>
<b>Permit Holder</b>	<ul style="list-style-type: none"> <li>• Completes a Safe Work Method Statement (SWMS)/Hazard Identification and Task Risk Assessment (HITRA)/Job Safety Analysis (JSA) form that reflects the Hierarchy of Control before confined space entry</li> <li>• Ensure only a competent person can perform work in a confined space</li> <li>• Ensure all equipment used comply with relevant code of practice or regulation, be fit for purpose, well maintained and certified where required</li> <li>• Familiar with Rescue Plan requirements</li> </ul>
<b>Confined space entrant</b>	<ul style="list-style-type: none"> <li>• Trained in the risks associated with confined space entry (refer to Section 5. 2 Competency requirements)</li> <li>• Familiar with Rescue Plan requirements</li> </ul>
<b>Authorised Gas Tester</b>	<ul style="list-style-type: none"> <li>• Appointed by the Permit Holder</li> <li>• Responsible for taking the necessary steps to confirm that the atmosphere in, on and about the work area means the work can be performed in a safe manner.</li> <li>• Trained and experienced to perform the gas testing and to operate the gas testing device (refer to Section 5. 2 Competency requirements)</li> </ul>

Electronically Controlled Document. Refer to online document for current version.

<b>Custodian:</b> Graham Knox	<b>Owner:</b> Head of Safety, Wellbeing & Risk	<b>Document No.:</b> CD21447	<b>Page:</b> 5 of 15
<b>Approved:</b> 29/05/2025	<b>Published:</b> [Published Date]	<b>Periodic Due Date:</b> 26/11/2029	<b>Version:</b> 1





Division	Z Energy
Type	Safe Work Practice
Title	<b>Safe Work Practice Confined Space - Z Energy</b>

Role	Responsibility/Accountability
	<ul style="list-style-type: none"> <li>Correctly use an approved gas-testing instrument</li> <li>Verify the instrument is working correctly, interpret and apply the results given by the equipment.</li> <li>Bump test gas detectors, before each day of use and record results . Remove gas detectors from service that have failed bump test.</li> </ul>
<b>Standby person</b>	<ul style="list-style-type: none"> <li>Know the hazards of the confined space, mode of exposure, signs and symptoms of exposure, and consequences of exposure.</li> <li>Trained in the risks associated with confined space entry (refer to Section 5. 2 Competency requirements)</li> <li>Ensure the conditions and requirements listed on the permit are adhered to.</li> <li>Prevent the fouling of airlines and/or lifelines, when these are used.</li> <li>Evacuate the confined space if any condition is observed which is hazardous, or if entrants exhibit any behavioural effects of hazard exposure.</li> <li>In continuous contact with those inside, to initiate Rescue Plan procedures and operate equipment used for entry to the Confined Space, where necessary</li> <li>Ensure unauthorised individuals do not enter the confined space.</li> <li>Maintain an accurate, written count of entrants.</li> <li>Be familiar with Rescue Plan requirements, and activate plan without hesitation should the need arise</li> <li>Get help if an emergency develops, using the site emergency telephone number (where this exists), radio, or other pre-planned means. Under no circumstances shall the Standby Person enter the confined space or attempt rescue by entering the confined space unless backup support is present.</li> <li>Ensure Entrants are correctly wearing all Personal Protective Equipment, including any additional Personal Protective Equipment identified in the TRA for increased Safety or Rescue precautions. All Personal Protective Equipment must be in good working condition.</li> <li>Maintain contact with Site office – informing when Entrants are entering and exiting the Confined Space</li> <li>Maintain a note of those Entrants at the worksite utilising the “Confined Space Entry Tally Board”</li> </ul> <p>NOTE: At the discretion of the Permit Issuer, and where there is deemed to be no compromise to safety, the roles of Fire Watch and Standby Person for the same job may be filled by the same person.</p>

## 8. Requirements

All confined space entry shall be managed under the **Z Permit to Work System (PTW)**.

**A Work Permit** is required for all work that involves confined space entry.

A **Confined Space Entry Certificate** must be used in conjunction with the permit to provide a higher level of detail on the controls to be put in place to manage the activity. The certificate authorises entry into the Confined Space for visual inspection, Cold and/or Hot Work. Any work to be performed must be detailed on the Permit and risk assessed through the HITRA process.

### Emergency Response Procedures (ERP)

Electronically Controlled Document. Refer to online document for current version.			
<b>Custodian:</b> Graham Knox	<b>Owner:</b> Head of Safety, Wellbeing & Risk	<b>Document No.:</b> CD21447	<b>Page:</b> 6 of 15
<b>Approved:</b> 29/05/2025	<b>Published:</b> [Published Date]	<b>Periodic Due Date:</b> 26/11/2029	<b>Version:</b> 1



Division	Z Energy
Type	Safe Work Practice
Title	<b>Safe Work Practice Confined Space - Z Energy</b>

For all works undertaken, emergency response procedures need consideration should controls fail, or due to unforeseen circumstance beyond our control. PI and permit holder need to consider all credible emergencies and have a response plan in place that identifies required actions and resources. This could include but not limited to; identifying a First Aider and means of contacting, identifying location of first aid kit and other resources, having a certified breathing apparatus (with at least 15 minutes of breathable air), evacuating the area, calling for Emergency Services.

## Rescue Plan

For each Confined Space Entry, a rescue plan (using the template HS-IOA-FOR-005) shall be developed and agreed. The rescue plan is to be rehearsed as far as is practicable without undue risk to personnel, to the extent that it provides confidence in its effectiveness. All those named in the rescue plan must be involved in the rehearsal.

## 8.1. Hierarchy of controls

At all times, when working in a confined space, make a risk assessment and apply the “Hierarchy of Controls”, in descending order. Apply additional risk controls so far as reasonably practicable.

### 8.1.1. Eliminate the risk

Always, as a first step, check to see if the work can be done with equipment from outside the confined space. The golden rule is: Don't go in if you don't have to.

By definition, confined and restricted space work do not occur on an on-going basis (i.e. not routine), hence can and should be identified and planned for in advance to be effectively organised.

### 8.1.2. Isolate the hazard

Isolate contaminants and moving parts. Prevent accidental introduction of materials (e.g. steam, water or bulk materials, through piping, ducts, vents, etc).

Important: These steps should be done before entry to confined space. Isolate the confined space and surrounding work area from non-essential personnel.

#### 8.1.1.1. Lock out tag out

De-energise, lockout or tagout machinery. Refer to the Z LOTO procedure.

#### 8.1.1.2. Purging

This refers to the displacement of contaminants from an area, vessel or confined space by displacement with air, inert gases, or water.

Use vapor and gas freeing, degassing and ventilating equipment, including but not limited to inductor, air blowers, flexible tubing for suction and exhaust, air compressors, hoses and connectors, tank opening covering and, where required, degassing vapour recovery or vapour treatment equipment.

Permit Holders shall ensure that all hoses, valves, flanges, fittings, blinds and gaskets to be used are appropriate for the anticipated exposures and pressures.

**WARNING: Never use oxygen to purge a confined space: this can create a fire and explosion hazard.**

Electronically Controlled Document. Refer to online document for current version.			
Custodian: Graham Knox	Owner: Head of Safety, Wellbeing & Risk	Document No.: CD21447	Page: 7 of 15
Approved: 29/05/2025	Published: [Published Date]	Periodic Due Date: 26/11/2029	Version: 1



<b>Division</b>	Z Energy
<b>Type</b>	Safe Work Practice
<b>Title</b>	<b>Safe Work Practice Confined Space - Z Energy</b>

### 8.1.3. Apply engineering and administrative controls

#### 8.1.1.3. Gas testing and monitoring

Conduct gas testing to ensure hazards have been removed and the atmosphere is within acceptable limits. Continuous monitoring is required, including provisions for fixed location detectors and personal gas detectors.

Atmospheric testing for Confined Space Entry shall be per the requirements of Australian Standard AS 2865-2009 (Safe Working in a Confined Space). Refer to section 5.6 for more details.

#### 8.1.1.4. Ventilation

Ventilation occurs after flammable vapours, toxic vapours and gases, dusts, fumes or mists have been displaced or diluted by the outside atmosphere. This is also referred to as degassing. This means allowing flammable and hazardous gases and vapour to vent outside the confined space and fresh air to get inside a tank to maintain an atmosphere within acceptable limits.

Mechanical ventilation is the preferred method to ensure contaminants are vented off safely and remain below the required exposure standard levels. A number of air changes may be required per hour to achieve this.

Natural ventilation is less preferred method of ventilation. But may be appropriate in some cases i.e excavations.

#### 8.1.4. Use appropriate PPE

If the space can't be fully ventilated, or if the work will contaminate the atmosphere (e.g. hot work, painting, sludge removal), use a suitable breathing apparatus or supplied-air respirator for entry.

- **IMPORTANT NOTICE:** Work in which a person breathes compressed air, or a respiratory medium other than air requires notification to WorkSafe NZ, 24 hours prior to the planned commencement of works. Wearers of Breathing Apparatus are required to be medically fit.

PPE should be combined with other control measures to control the risk. As well as respiratory protective equipment (RPE), this could include items such as safety helmet, gloves, hearing protectors, safety harness and lifeline. Refer to Z PPE Management procedure when selecting the right PPE for an emergency response.

## 8.2. Competency

Specialised training and competencies are required before an individual is to be assigned a specific PTWS operational responsibility. Table 1 specifies training requirements for personnel involved in performing confined space entry.

**Table 1. Training and competency requirements for confined space entry (Completed within 3 years)**

PTW Roles	Training	Description
<b>Authorised Gas Tester</b>	NZQA US 3058	Perform gas tests for an energy and chemical plant
	NZQA US 25510	Operate an atmospheric testing device to determine a suitable atmosphere exists to work safely
	<b>AND</b> Must be trained in the use of the specific gas-detector device used during the work permit activity	
	NZQA US 3058	Perform gas tests for an energy and chemical plan

**Electronically Controlled Document. Refer to online document for current version.**

<b>Custodian:</b> Graham Knox	<b>Owner:</b> Head of Safety, Wellbeing & Risk	<b>Document No.:</b> CD21447	<b>Page:</b> 8 of 15
<b>Approved:</b> 29/05/2025	<b>Published:</b> [Published Date]	<b>Periodic Due Date:</b> 26/11/2029	<b>Version:</b> 1





<b>Division</b>	Z Energy
<b>Type</b>	Safe Work Practice
<b>Title</b>	<b>Safe Work Practice Confined Space - Z Energy</b>

PTW Roles	Training	Description
<b>Confined Space Entrant</b>	NZQA US 25510	Operate an atmospheric testing device to determine a suitable atmosphere exists to work safely
	NZQA US 17599	Plan a confined space entry
	NZQA US 18426	Demonstrate knowledge of hazards associated with confined spaces
	<b>AND</b> Must have knowledge of developing and rehearsing Rescue Plans	
<b>Confined Space Entrant wearing Breathing Apparatus</b>	NZQA US 3272	Wear and operate breathing apparatus in general emergencies (only if required in the work)
	Or NZQA US 25044	Or Wear and operate compressed air breathing apparatus in the workplace (only if required in the work)
	Plus, above CSE Entrant requirements	
<b>Standby person for CSE</b>	NZQA US 18426	Demonstrate knowledge of hazards associated with confined spaces
	NZQA US 3058	Perform gas tests for an energy and chemical plan
	NZQA US 25510	Operate an atmospheric testing device to determine a suitable atmosphere exists to work safely
	If named as entrant within agreed Rescue Plan NZQA US 3272 Or NZQA US 25044	Wear and operate breathing apparatus in general emergencies (only if required in the work) Or
	Or Equivalent	Wear and operate compressed air breathing apparatus in the workplace (only if required in the work)  Or Equivalent external training course
	<b>And</b> Must be familiar with the Rescue Plan	

### 8.3. Fitness for work

- A competent person must be physically fit for the task, must have the ability to identify hazardous conditions, and must take action to maintain a safe workplace.
- Fitness to work of the individuals undertaking the confined space activity must be considered as part of the risk assessment.

In order to ensure the health of the individual during the activity the HITRA must include requirements for:

- Those undertaking the confined space activity need to hydrate regularly.
- Rest periods must be agreed to enable regular rest and re-hydration.
- A rescue plan must be agreed for the individual to advise immediately if experiencing fatigue, dizziness, or any other impairment.
- Realistic parameters for work pace must be agreed when wearing BA in a confined space.
- Workers exposure to extreme temperature within the tank (acceptable is within 5°C -

Electronically Controlled Document. Refer to online document for current version.			
<b>Custodian:</b> Graham Knox	<b>Owner:</b> Head of Safety, Wellbeing & Risk	<b>Document No.:</b> CD21447	<b>Page:</b> 9 of 15
<b>Approved:</b> 29/05/2025	<b>Published:</b> [Published Date]	<b>Periodic Due Date:</b> 26/11/2029	<b>Version:</b> 1



Division	Z Energy
Type	Safe Work Practice
Title	<b>Safe Work Practice Confined Space - Z Energy</b>

42°C)

- If workers are exposed to extreme temperatures or physical demands, refer to **Managing Fatigue at Z guidelines** to address the risks of fatigue (HS-HAW-H-GUI-001).
- Workers must comply with **Z's Drug and Alcohol policy**. Z requires the performance of its staff, contractors and others on Z premises or operating equipment on Z's behalf to be unimpaired by alcohol or drugs.

## 8.4. Equipment used in CSE

- Electrical equipment or lighting for use within a Confined Space shall be fitted with an RCD. All electrical cables must be of a heavy-duty type or armoured cable. Where available, it is recommended that battery tools are used where possible. If flammable vapours (e.g. paint fumes, refer to SDS) or significant dust build are present, Ex rated lighting should be used.
- All equipment used in CSE must carry appropriate and current certification and be visually inspected prior to each use.
- Oxy/acetylene cylinders, or any other cylinders other than those on Self Contained Breathing Apparatus, must never be placed or taken inside a confined space – they must be placed outside and hoses run into the work location. Hoses, leads, and torches should be removed during meal or rest breaks, at the end of each day, and at the completion of the work
- When electric welding is used in a Confined Space, the outside Standby Person is to have control of the welding power supply isolation, to switch off power supply in an emergency – normally from a generator.

## 8.5. Isolations

### 8.5.1. General requirements

Given the specific hazards of Confined Space Entry, isolation plans shall be subject to formal risk assessment.

- Isolations shall be made to prevent the accidental introduction into the confined space of materials, through equipment such as piping, ducts, vents, drains, conveyors, service pipes or fire. The method of isolation shall be by Positive Isolation (air gap).
- Wherever possible, isolations should be made as near to the Confined Space to be entered as possible. Where this is impractical because of the size of a piping connection, or where piping connections are welded to the vessel / equipment, then, the isolation should be made at the nearest available place to the vessel / equipment. The interconnecting piping between the vessel / equipment then becomes an integral part of the Confined Space and has to be taken into account when preparing for entry and issuing Confined Space Entry Permits.

Particularly important aspects are:

- i) the natural "chimney effect" of large vertical tower, vessels, pipework (e.g. overheads lines),
  - ii) the effects of winds to create a low-pressure area downwind of manways and other openings which could result in an airflow and contaminants moving inside a vessel / equipment in the reverse direction to that expected,
  - iii) Connecting piping may contain harmful materials not removed from the systems during purging and gas freeing, which can be subsequently released due to airflow and / or solar heating, or Hot Work.
- Piping that passes through a confined space but does not terminate, or discharge into the space (such as heating coils in a tank or furnace) shall be drained, and isolated using two valve (Double Block and Bleed is acceptable) isolation as the minimum form of isolation on that line.

Electronically Controlled Document. Refer to online document for current version.			
<b>Custodian:</b> Graham Knox	<b>Owner:</b> Head of Safety, Wellbeing & Risk	<b>Document No.:</b> CD21447	<b>Page:</b> 10 of 15
<b>Approved:</b> 29/05/2025	<b>Published:</b> [Published Date]	<b>Periodic Due Date:</b> 26/11/2029	<b>Version:</b> 1



Division	Z Energy
Type	Safe Work Practice
Title	Safe Work Practice Confined Space - Z Energy

### 8.5.2. Tanks

Positive isolation of all sources of energy is mandatory for confined space entry.

- Valves and/or sections of pipe from each connecting pipeline including foam pipelines (where installed) shall be removed from as near to the shell as possible and the open end of the pipelines shall be sealed with an appropriately line rated blank flange and ALL studs or bolts are installed and tightened.
- Reference shall be made to the relevant P&ID's and a completed Tank Decommission / Recommissioning Checklist will be available with isolation documents.
- All electrical connections other than extra low voltage equipment complying with AS3000 must also be positively isolated.
- Potential energy sources must also be discharged e.g. floating suction, by landing these onto solid supports.

### 8.5.3. Valve chambers and tank turrets

Positive isolation of all external sources of energy is often not practically achievable for pipeline valve chambers and tank turrets. The highest level of isolation practically achievable shall be determined in the risk assessment with appropriate approvals, controls and monitoring of isolation detailed and response to the loss of containment detailed in emergency response plans.

Where breaking into product lines inside tank turrets, mechanical ventilation should be considered as a control.

## 8.6. Gas/Atmospheric Testing

Atmospheric (gas/toxicity) testing must be conducted for all Hot Work and Confined Space Entry and test results recorded on the Gas Testing section of the Work Permit.

### 8.6.1. Control of hazardous vapours/gas

- Test the atmosphere for oxygen, toxic contaminants (e.g. hydrogen sulphide, carbon monoxide) and flammable contaminants (e.g. methanol). See Table 2. Any result different to the ideal – need to be investigated, addressed, and the area re-tested prior to entry for work.

**Table 2. Safe Levels**

	Oxygen (O <sub>2</sub> ) %	Flammables (LEL) %	Hydrogen Sulphide (H <sub>2</sub> S) ppm	Carbon Monoxide (CO) ppm	Methanol (MeOH) ppm
Required Results	20.8 (± 0.2)	0	0	0	0

- An Authorised Gas Tester (AGT) who have been trained and assessed as competent (see under Competency requirements) will carry out the gas testing.
- Standby person will be the designated gas tester and record ½ hourly gas testing and these will also be communicated to Z office via two-way radio (checking line of communications).

### 8.6.2. Use of gas detectors

- Use a suitable detector to determine whether the confined space contains a safe oxygen level for breathing.
- Gas Detectors shall be bump tested each day before use and results recorded. Any gas detectors that have failed bump test must be removed from service.
- Gas detectors must be calibrated annually by the manufacturer or agent, and calibrated monthly by the user.

Electronically Controlled Document. Refer to online document for current version.			
Custodian: Graham Knox	Owner: Head of Safety, Wellbeing & Risk	Document No.: CD21447	Page: 11 of 15
Approved: 29/05/2025	Published: [Published Date]	Periodic Due Date: 26/11/2029	Version: 1



Division	Z Energy
Type	Safe Work Practice
Title	Safe Work Practice Confined Space - Z Energy

### 8.6.3. Frequency of testing

- Initial gas testing of the confined space must be performed from outside by the AGT prior to worker's entry.
- The worksite gas test should be taken as close as practicable to the time of commencement of the work or entry.
- When the work ceases for more than 30 minutes, the atmosphere in the confined space shall be retested before re-entry or recommencement of work.
- The extent of gas testing required before a permit is issued or revalidated shall be determined by risk assessment and shall take into account conditions including but not limited to vapours coming from adjacent operations or being released from sludge's, rust and scale, or from foundations where floor plates are perforated or removed.
- The requirement for, and frequency of any on-going testing, shall be determined by the Permit Issuer.

#### 8.6.3.1. Gas testing with ventilation

- When performing gas testing of larger vessels (such as tanks) where a ventilation system is used to maintain a continuous air flow, the AGT must shut down the ventilation for at least 15 minutes (more time may be required depending on the size of the vessel and ventilation rate) before performing the gas test to get a representative sample. Once a representative sample has been obtained, the ventilation system can be returned to service.  
NOTE: The ventilation system must never be stopped while personnel are inside the confined space.
- Additional initial testing is needed inside larger confined spaces where it is not possible to test all areas of the space from the outside. If initial readings are not acceptable, then further ventilation is required.

#### 8.6.3.2. Continuous Monitoring

With a view to best practice, Continuous Monitoring will be the default requirement for gas testing for Confined Space Entries.

- Continuous monitoring of the atmosphere is required while work is underway especially there is the possibility of:
  - Contaminants leaching out from sludge or scale
  - Contaminants entering from outside and being trapped within (e.g. vapours from neighbouring tanks, taking prevailing winds into account)
  - The LEL being in excess of 0% of the documented LEL. (Evacuation is required if LEL > 5%). Note: Continuous monitoring is always preferred if it is practicable.
- Factors such as wind conditions and adjacent activities (simultaneous operations or "SIMOPS") need to be considered on the day and taken into account. Consider where vapours could migrate into the Confined Space – additional detectors may be required. For example - it is acknowledged that welding activities do produce toxic fumes that can interfere with detectors, therefore, the gas detector location needs to allow for this, and be in an "up-stream" position of the welding activity.

Electronically Controlled Document. Refer to online document for current version.			
Custodian: Graham Knox	Owner: Head of Safety, Wellbeing & Risk	Document No.: CD21447	Page: 12 of 15
Approved: 29/05/2025	Published: [Published Date]	Periodic Due Date: 26/11/2029	Version: 1



Division	Z Energy
Type	Safe Work Practice
Title	Safe Work Practice Confined Space - Z Energy

- The appointed standby person will have responsibility for monitoring of the Gas Detector(s), and will stop activity and require all entrants to leave the tank in the event of an alarm. Work can only re-commence once the source of the alarm is determined, retesting confirms 0% LEL, and the permit issuing PI has authorised work to restart. When it has deemed that Continuous Monitoring is not required, a Risk Assessment providing sufficient information to remove the need for Continuous Monitoring is to be completed. This can be in the form of an explanatory note in the free text fields of the permit forms referring to an entry in the Task Risk Assessment appended to the permit. Pre-work/Pre-Entry conditions shall remain unchanged prior to commencement of work.

Note: Simply not having sufficient gas detectors is NOT considered reason enough, and should be seen as a trigger to source additional resources – i.e. short-term rental units, or long-term purchase of additional units.

### Possible Exceptions to Continuous Monitoring inside the Confined Space

These need to be considered on a case-by-case basis but may include:

- Sandblasting activities risk contamination of the gas detector sensor. Sandblasting by its nature introduces significant quantities of fresh air in the work area and on larger jobs is often done in conjunction with forced air ventilation and dust capture.
- Coating applications risk contamination of the gas detector sensor – care needs to be exercised on placement of detectors.
- Hot Work activities involving welding fumes, care needs to be exercised on placement of detectors.

NOTE: Continuous Monitoring is to remain in place, within the general location i.e. a gas detector is sited outside of the immediate area to monitor the surrounding environment where vapours may enter the Confined Space – upwind, and between possible sources of vapour.

**Table 3. Confined space entry oxygen vs LEL percentages**

Conditions for Confined Space Entry		Percentage of Oxygen in Air (%O <sub>2</sub> )		
Percentage of Lower Explosive Limit (% LEL)	Over 5%	Less than 19.5 %	Between 19.5% & 23.5%	More than 23.5%
	Between 1% & 5% Continuous monitoring required	No Entry <i>Refer note 1</i>	No Entry <i>Refer note 1</i>	No Entry <i>Refer note 1</i>
	0 %	Entry with BA <sup>note 2</sup> for Cold work only	Entry with BA <sup>note 2</sup> for Cold work only	No Entry <i>Refer note 1</i>
		Entry with B.A. for Hot or Cold work	Normal entry for Hot or Cold Work	No Entry <i>Refer note 1</i>

Notes:

- Entry may only be made in life threatening circumstances with B.A. and Full PPE
- BA - Positive Pressure Breathing Apparatus

## 8.7. Working within the Confined Space

- A Standby Person will be appointed to the Confined Space work, and as such has control of the entrance, and responsibility for listening for and responding to Gas detector alarms.
- Gas Detection will be set-up within the tank and near the entrance, however, the gas detector located at the entrance is NOT sampling where the entrant is physically located, so any contamination near the entrant/s would not be apparent. Therefore, a gas detector will also be worn by at least one Entrant, making a minimum of two gas detectors a requirement for any Confined Space Entries.

Electronically Controlled Document. Refer to online document for current version.			
Custodian: Graham Knox	Owner: Head of Safety, Wellbeing & Risk	Document No.: CD21447	Page: 13 of 15
Approved: 29/05/2025	Published: [Published Date]	Periodic Due Date: 26/11/2029	Version: 1





Division	Z Energy
Type	Safe Work Practice
Title	Safe Work Practice Confined Space - Z Energy

- Entrants wearing personal gas detection equipment are to communicate any concerns to the Standby Person.
- Where multiple entrants are entering a Confined Space, additional units may be required – more applicable when entrants are working in different locations/levels – e.g. erection of scaffolding.
- When entrants are using Breathing Apparatus with an external air supply (BA or air hose feed), they will still carry detectors and leave if they alarm. Wearers of Breathing Apparatus are required to be medically fit.

#### 8.6.4. Confined Space Entry Tally Board

A board will be used in the field by the Standby Person to register Entrants In/Out of the Confined Space.

#### 8.6.5. Permit Issuer entering Confined Space

At times the Issuing Permit Issuer maybe requested by the Recipient, or Works Supervisor to enter the Confined Space for the purposes of inspection of work. Under these circumstances, the Issuing PI of the day may enter the Confined Space as long as they meet all the entry requirements as determined by the TRA, Rescue Plan, and any other controls associated with the Confined Space activity. Prior to entry, they must report to the Standby Person, and sign-on as an Entrant accordingly.

### 8.8. Re-establishing Worksite

Permits are only valid for the period specified on the permit, and only while conditions remain unchanged. If conditions change significantly, or work ceases for more than 30 minutes, the permit shall become invalid. In such cases, all tests and inspections must be repeated before work recommences, and the permit revalidated by the Permit Issuer.

In cases such as stopping work for meal breaks, the Confined Space area shall be retested by the Permit Issuer or a delegated authorised gas tester to confirm absence of vapours before work recommences.

### 8.9. WorkSafe notifiable work (related to confined space entry)

The Health and Safety in Employment Regulations 1995 require employers as well as the person who controls a place of work to provide at least 24 hours' notice to WorkSafe of particularly hazardous work as defined below:

- Work in any pit, shaft, trench, or other excavation in which any person is required to work in a space more than 1.5 metres deep and having a depth greater than the horizontal width at the top.
- Work in which a person breathes compressed air, or a respiratory medium other than air

## 9. Entry to Leaded Tanks or Tanks Previously Containing Leaded Fuel

Z fuel storage tanks have not contained leaded products since it was banned in 1996. However, previously leaded tanks may still contain residual contamination which poses a serious health risk. Z applies a precautionary approach based on validated sampling to confirm whether the tank can be safely entered without the need for specific PPE and health monitoring.

Electronically Controlled Document. Refer to online document for current version.			
Custodian: Graham Knox	Owner: Head of Safety, Wellbeing & Risk	Document No.: CD21447	Page: 14 of 15
Approved: 29/05/2025	Published: [Published Date]	Periodic Due Date: 26/11/2029	Version: 1



Division	Z Energy
Type	Safe Work Practice
Title	Safe Work Practice Confined Space - Z Energy

## 9.1. Entry Conditions for tank cleaning

Assume all tanks are leaded until sludge and rust sampling confirms otherwise. No entry is permitted before sampling results are returned except for tank cleaning, where personnel must:

- Wear full sealed chemical PPE including taped disposable overalls, gloves, gumboots
- Use positive-pressure BA supplied with filtered air
- Be restricted from hot work (no welding or cutting) unless the tank is confirmed lead-free
- Continuous tank Ventilation

## 9.2. Lead Sampling

- Sludge and scale must be sampled from the tank base, walls, and roof rafters (where safe).
- If invasive works are required (welding, grinding etc), testing the internal lining for leaded paint is required
- A tank is only considered safe for invasive works if:
  - It has documented history of never containing leaded product; **or**
  - Laboratory testing confirms lead is <100ppm (0.01%) in all samples
- Each tank must be tested individually—do not rely on sampling results from other tanks

## 9.3. Requirements for non-invasive works

On confirmation of sample results, and after tank cleaning non-invasive works such as visual inspections and Non-destructive testing can be carried out with normal CSE controls in place.

## 9.4. Requirements for invasive works

Any task that may generate airborne lead contamination (e.g welding, grinding, paint removal) requires:

- Sampling and testing of internal coatings for lead- based paint
- Where lead is present, follow AS/NZS4361.2- guide to hazardous paint management- part 2
- Controls such as sealed PPE, Respiratory protection

## 9.5. Health Monitoring (For Confirmed or Suspected Leaded Tanks)

Entry into a tank before confirmation of lead-free status must only be carried out by specialist contractors familiar with the work and must have a health monitoring program that tests for lead exposure.

## 9.6. Risk Assessment and Authorisation

- Where a tank is confirmed or assumed to be lead-contaminated, or if entry is required after cleaning and before confirmation of lead free status the risk assessment must include health monitoring for lead exposure
- The HITRA must be reviewed and signed off by a Senior Permit Issuer (SPI) before work proceeds

Electronically Controlled Document. Refer to online document for current version.			
Custodian: Graham Knox	Owner: Head of Safety, Wellbeing & Risk	Document No.: CD21447	Page: 15 of 15
Approved: 29/05/2025	Published: [Published Date]	Periodic Due Date: 26/11/2029	Version: 1