STANDARD

The words **MUST** means it is a mandatory requirement.
Where you see the words it's **YOUR CALL** it means you are strongly advised to do this, but you can use your judgement.

Confined Space

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1.0 Purpose

The purpose of this Standard is to ensure that confined space activities can be carried out on Contact assets safely. This will be achieved through the implementation of a safe system of work and covers:

- undertaking work in a confined space; and,
- conducting inspections in a confined space.

This standard helps our people with the management of the health and safety risks associated with entering and working within confined spaces in accordance with legislative requirements.

2.0 Scope

This Standard applies to all confined spaces under the management or control of Contact Energy,

3.0 Definitions

A confined space is defined in Standard AS/NZS 2865 – 2009: Confined Spaces 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:

(a) an oxygen concentration outside the safe oxygen range.
(b) a concentration of airborne contaminant that may cause impairment, loss of consciousness or asphyxiation.
(c) a concentration of flammable airborne contaminant that may cause injury from fire or explosion.
(d) engulfment in a stored free-flowing solid or a rising level of liquid that may cause suffocation or drowning.

How do I know when I am in a confined Space ?

When your head or upper body is within the boundary of the confined space then you are in a confined space.

Inserting an arm for the purpose of atmospheric testing is not considered an entry into a confined space.

4.0 How we will Apply this Standard.

The steps below outline how Contact Energy applies and meets the requirements of AS/NZS 2865 – 2009: Confined Spaces:

A work order will be raised which identifies the potential need to employ confined space procedures. The work plan should be reviewed to determine if the work can be done without entering the confined space, for example, can the work be carried out using a drone or camera? If the work still requires confined space entry, then confined space planning should continue.

Confined Space Risk Assessment

When planning a confined space entry, a risk assessment is required to identify any hazards known about the confined space, the work to be conducted, and to establish the appropriate controls necessary to eliminate or isolate these hazards. The risk assessment **MUST** be performed before any confined space work is undertaken and should be conducted in consultation with those involved with planning and those undertaking the work.

The risk assessment can be undertaken on the **Confined Space Entry Certificate** which **MUST** be completed prior to confined space work.

Site specific confined space registers should be used to identify any hazards already known to exist within a specific confined space. Where a confined space is new or not listed in a confined space register, the hazards related to that confined space **MUST** be identified during the risk assessment.

The risk assessment **MUST** consider and identify:

- the hazards of the confined space (known and suspected)
- the tasks required to be conducted during the confined space work.
- any additional risks related to the Confined Space
- the selected method of work and the equipment to be used.
- the emergency response procedures,
- the required competence of the persons conducting the task.
- Communication protocols and methods

*Where a risk assessment identifies a risk to health or safety, the risk **MUST** be eliminated or, if this is not possible, effectively managed by the implementation of appropriate and effective risk control measures. All risk control measures **MUST** be documented and reviewed, and consideration should be given to further reviewing controls during the work if anything has changed.*

Where there are multiple confined spaces in which similar tasks are conducted, and the risk factors are alike, a shared generic risk assessment may be appropriate.

Any risk assessment should be considered to be a live document and at any time should be revisited when you think that the level of risk has changed, or a new hazard has been introduced.

Factors that may change the risks in a confined space may include, but are not limited to:

- installation or modification of plant.
- a change in equipment operating conditions.
- a change in the atmosphere or occupational environment.
- a change in working arrangements or procedures; or,

- incidents that affect, or could affect, the safety of persons.

Refer to the **Enterprise risk matrix** to calculate the level of risk associated with the confined space.

Factors to consider when undertaking a risk assessment of a confined space could include but is not limited to the following:

- atmospheric assessment that includes the testing or monitoring to be undertaken and the parameters to be assessed before an approval is issued.
- engulfment of a person in any flowing solids in the confined space or engulfment from a rising level of liquid in the confined space.
- all proposed operations and tasks, particularly those that may cause change to the conditions in the confined space.
- the number of persons occupying the space.
- the soundness and security of the overall structure and the need for illumination and visibility.
- the identity and nature of the substances last contained in the confined space.
- any risk control measures needed to bring the confined space to atmospheric pressure.
- the number of persons required outside the space to:
  - maintain equipment essential for the task being undertaken within the confined space.
  - provide adequate communication with and observation of the persons within the confined space; and,
  - properly initiate emergency response procedures.
- risks associated with other hazards.
- arrangements for emergency response (e.g., first aid and resuscitation).
- the physical and mental requirements of the task and the competency of those persons involved in the tasks or emergency response duties.
- adequate instruction of those persons in any required procedure, particularly those which are unusual or non-typical, including the use and limitations of any personal protective equipment and mechanical or other equipment to be used.
- the availability and adequacy of appropriate personal protective equipment protective clothing and emergency equipment for all persons likely to enter the confined space.
- the need for additional risk control measures, including:
  - hot work in adjacent areas.
  - smoking and naked flames within the confined space and, where appropriate, the adjacent areas.
  - avoidance of contamination of breathing air from operations or sources outside the confined space, e.g., from the exhaust of an internal combustion engine.
  - movement of equipment such as forklifts in adjacent areas.
- whether purging or cleaning in the confined space is necessary.
- whether hot work is necessary,
- conditions that could impede entry and exit or the conduct of the tasks in the confined space.

Hierarchy of Risk Control Measures

A hierarchy of risk control measures to eliminate or, if this is not possible, minimise the risk should be followed in the priority order listed.

- **elimination.** (Removing the need to have a saw on site by purchasing pre-cut timber lengths)
- **substitution**.(Using electric motors rather than diesel to eliminate diesel exhaust emissions)
- **isolation.** (Using block and bleed to isolate an energy source from people)
- **engineering controls.** (Using machine guards to shield workers from a hazard)
- **administrative controls** (administrative controls like a procedure generally rely on a human being following a prescribed way of doing work and for this reason should only be used when the risk cannot be eliminated by other measures);
- **use of personal protective equipment.** (Personal protective equipment **MUST** always be worn but should only be considered as a last resort and should not be relied on solely).

Combining risk control measures

The process of progressively applying the elements of the hierarchy of risk control should continue until the risks have been eliminated or minimised. It may be necessary to use a combination of risk control measures to eliminate or minimise the risk.

Isolation Requirements

The isolation process physically separates sources of harm from the people performing the work within the confined space and provides protection against inadvertent operation of plant. Those sources of harm might include pressure, temperature, chemical, engulfment, electrical or mechanical energy.

All potentially hazardous services, including all process services normally connected to that space **MUST** where possible, be isolated in order to prevent:

- the introduction of any materials, contaminants, agents, or conditions harmful to people within the confined space.
- the activation or energising in any way of equipment or services that could pose a risk to the health or safety of people within the confined space.
- Where possible, isolations are required to be proven effective to provide safe entry.
- If an isolation cannot be proven (e.g. where you can not apply block and bleed) then you **MUST** consider additional controls to manage the risk.

The Senior Authorised Person (SAP) **MUST** determine what isolations are required to achieve a safe place of work. Where isolations are required, they **MUST** be installed, locked, and tagged in accordance with the approved permit process, a Safety Document **MUST** be issued prior to entry into the Confined Space.

Examples of positive isolation.

- pipework/spool removal
- rated blank flange installed to open process pipework,
- solid blind/spade installed as close as possible to the Confined Space,
- A double block and bleed,
- An electrical cell isolation.

Purging Operations

Gas detection **MUST** be used to identify if there are any harmful atmospheric contaminants within the confined space. If harmful atmospheric contaminants are identified the atmosphere within the confined space **MUST** be cleared through the use of a suitable purging agent and process.

Where a permit needs to be issued for entry to a confined space to conduct atmospheric testing, the permit approval should include any risk control measures necessary for safe entry and atmospheric testing. An example of the control measures required for entry may state that supplied-air respiratory protective devices **MUST** be worn to allow for the atmospheric testing to be undertaken.

The purging agent or any gas used for ventilation purposes **MUST** not be pure oxygen or gas mixtures with oxygen concentration greater than 21%.

Exclusion zones should be considered as part of the confined space purging process with the erection of signage and barriers around vents and openings to prevent inhalation of exhaust fumes by personnel outside the confined space.

Safe Atmospheric Testing

Before a person enters a confined space the atmosphere within the confined space **MUST** be determined to have:

- a safe oxygen range. Between: 19.5% and 23%
- levels of airborne contaminants that may cause impairment, loss of consciousness or asphyxiation have been reduced to below the relevant exposure levels.
- concentrations of flammable airborne contaminants below 5% LEL.

Name	Symbol	Desired Reading	Acceptable Safe Range
Oxygen	0_2	20.9%	Between: 19.5% and 23%
LEL (Methane/LPG)	CH_3 CH_4	0% LEL	Below 5% For hot work in C.S <1%
Carbon Monoxide	CO	0ppm	Below 25ppm
Hydrogen Sulphide	H_2S	0ppm	Below 5ppm
Carbon Dioxide	CO_2	0.04%	Below 0.5%

Where the identified risk control measures cannot provide oxygen levels within the atmosphere greater than 19.5% or the airborne contaminants that may cause impairment, loss of consciousness or asphyxiation cannot be reduced below the relevant exposure standards, no persons **MUST** enter the confined space unless they are equipped with supplied-air respiratory protection. Where appropriate any additional personal protective equipment may also be required.

Entry to a confined space **MUST** NOT be undertaken where the LEL exceeds 5%

The levels of oxygen and selected atmospheric contaminants within the confined space **MUST** be continuously measured. The safety watch **MUST** monitor and record the atmosphere, these results should be recorded the Confined Space Atmospheric Conditions Card. The recording frequency is set out on the Confined Space Atmospheric Conditions Card and is based on the risk level of the confined space identified during the risk assessment process on the Confined Space Entry Certificate.

Low risk - Record every hour	Medium risk - Record every 30 minutes	High risk - Record every 15 minutes

Provision of Equipment

Equipment **MUST** be suitable for the work being carried out in the confined space and maintained in a proper working condition. The personal protective equipment and emergency response equipment **MUST** be selected and fitted to suit the individuals involved in working within the confined space.

Consideration should be given to the following:

- personal protection.
- emergencies including rescue.
- first aid
- fire suppression.

Emergency Response Plan

The Emergency Rescue / Response Plan which forms a part of the Confined Space Entry Certificate **MUST** describe the procedures that will be used to manage any identified emergency that may arise in respect to the confined space entry and **MUST** include the:

- steps to be taken by the personnel involved for each situation.
- instructions for entry or non-entry response.
- details on who to notify and their contact details.
- equipment that may be required for rescue, first aid, resuscitation.
- relevant competencies required for the use of specialist equipment; and,
- actual method or process, needed to extricate a person from the confined space.

Where the risk assessment shows the risks associated with the work or the conditions of the confined space are high, it is strongly recommended that consideration is given to contracting in appropriately qualified rescue specialists to provide the:

- Emergency Rescue / Response Plan in consultation with site personnel.
- emergency response personnel; and,
- specialist equipment required.

Emergency Rescue / Response Plans **MUST** be reviewed as part of the confined space entry planning process.

If practicable, all members of the Confined Space entry team should be involved in the planning and rehearsal of the Emergency Rescue/ Response Plan. Where this is not possible, the confined space entry team should be well briefed with regard to the rescue plan.

Withdrawal and Closure

To avoid entombing a person within the confined space, on completion of the assigned task all work party members **MUST** be withdrawn from the confined space.

The safety watch, and the person in charge of the work **MUST** confirm on the Confined Space Entry Certificate that all persons are accounted for and inform them not to re-enter the confined space.

Once the confined space has been confirmed as clear of persons, any open entry points **MUST** be secured to prevent anyone from entering the confined space while it is being closed. Once the confined space is secured all safety documents **MUST** be cancelled.

Training and Competency

Training is essential in providing people with the knowledge to:

- successfully implement and comply with legislative obligations; and,
- manage confined space entry along with the associated risks.

No-one **MUST** enter a confined space unless they can demonstrate they have the required level of training and competency to perform their duties. Checks on training and competency should be confirmed prior to any confined space taking place, this should be done during the work planning process. All persons **MUST** be able to demonstrate their training and competency through a valid Green Passport, a StayLive Competency Card, training records or other suitable evidence.

The Safety Watch can act as a last line of protection for those working within a confined space and should confirm they have sighted evidence of training and competency of all individuals prior to that persons first entry into a confined space. If evidence cannot be provided the individual **MUST** be denied access to the confined space.

Where possible, before travelling, overseas Contractors **MUST** provide evidence of confined space training to an appropriate level of knowledge and competence in their own country. All evidence **MUST** be reviewed and assessed by the Head of Generation.

The specific role requirements for Confined Space training and assessment of competency are as follows:

	Refresher Period	Unit Standards	Work Scope Applicable
Full Confined Space - Entry / Exit and may undertake work.	3 years	US -17599 and US -18426	Enables entrant to perform physical work activities in a confined space.
Gas Detection	3 years	US -25510 or US -3058	For those persons who will undertake initial gas testing and confirmation.
Confined Space - Entry / Exit (Limited)	3 years	US - 18426	Enables entrant (who may not hold the identified training requirements) to perform: • inspections; or, • observations only. While being fully supervised at all times by a confined space competent person (Full).
Safety Watch	3 years	US - 17596 and / or: US - 17599 Plus US – 3058 or US - 25510	For persons who are required to perform safety watch duties. For those undertaking safety watch in confined spaces **US 17599** is required
Confined Space (Entry/ Exit) **(Visitor) –** only applicable to low risk entry	Valid for 24 hours	Not applicable	Having first: • completed the confined space awareness briefing (as per check sheet); and, • received approval from the applicable Head of Generation. The entrant may enter the confined space under personal supervision (i.e., by a fully trained person) as an observer only.
Visitor Entry – Low Risk (on Risk Matrix) entry, A visitor is only permitted to carry out a visual inspection. No work will be undertaken while this inspection is taking place and only those who need to be in the space will be present. Where a low risk confined space activity has been identified and conditions allow, a visitor will be able to enter the confined space having undergone the appropriate visitor confined space briefing which has been approved by the Head of Generation.			

5.0 References

Legislation

Health and Safety at Work Act 2015.

Standards

- AS/NZS 2865 – 2009: Confined Spaces
- NOTE: Guidance on risk assessment may be found in AS/NZS ISO 31000:2009

6.0 Notes

Explosive limit	*Lower explosive limit (LEL)* In relation to a flammable contaminant, the concentration of the contaminant in air below which the propagation of a flame does not occur on contact with an ignition source. *Upper explosive limit (UEL)* In relation to a flammable contaminant, the concentration of the contaminant in air above which the propagation of a flame does not occur on contact with an ignition source.
Gas cylinders	Except for cylinders that are used with self-contained breathing apparatus, no cylinders of compressed or liquefied gas **MUST** be taken into a confined space. These cylinders **MUST** remain secured outside of the confined space at all times. All hoses supplying gas operated equipment that used in a confined space should be located, suspended, or otherwise guarded to avoid accidental damage. In addition, these hoses should be tested for leaks prior to installation. The compressed or liquefied gas supply to equipment in the confined space **MUST** be turned off at the cylinder valve when not in use.
Hot work	Hot work is considered to be welding, thermal or oxygen cutting, heating, including fire-producing or spark-producing operations that may increase the risk of fire or explosion.
Notifiable Work	Various types of activities associated with confined spaces may be deemed 'Notifiable Work. This may include work in which any person breathes air that is or has been compressed or a respiratory medium other than air.
Portable electrical equipment	The portable electrical equipment should: • be protected through a residual current device with the device being located outside the confined space; and, • be intrinsically safe where there is a potential for combustion. Where available, it is recommended that double-insulated electrical tools be used. Where a flammable atmosphere is liable to exist, precautions should be taken to eliminate all sources of ignition.

7.0 Roles and Accountabilities

All persons who enter confined spaces

Before entering any confined space, the work party **MUST** ensure that:

- the Confined Space Entry Documentation set has been reviewed and they are familiar with its requirements.
  The Confined Space Document set will at a minimum comprise the
  - Confined Space Permit
  - Confined Space Entry Certificate
  - Confined Space Atmospheric Conditions Card
- they have signed the acknowledgement of the hazards, control measures, emergency response and level of identified risk associated with the confined space work.
- the Emergency Response Plan has been discussed and understood.
- each person signs in on the Confined Space Sign-On Register prior to entry and signs off immediately upon exiting. The record of entry/ exit is maintained by the safety watch person.

While in the confined space each member of the work party **MUST**:

- immediately vacate the confined space where a safety monitoring alarm sounds.
- comply with any instruction to leave the confined space; and be alert to an instruction from the Safety Watch, changes in the confined space, and changes in the other people working in the confined space.

Senior Authorised Person (SAP)

The SAP **MUST**:

- determine whether the requirements for safe access require the issue of a permit.
- be responsible for issuing the permit; ensures the application of isolations and,
- confirm that the ventilation of the confine space has been undertaken, issues written authority to test the confined space.

Nominated Supervisor (NS)

The NS **MUST**:

- plan for and establish general safety prior to the confined space work, assigning a safety watch and assist in rescue plan development.
- Gains authority to undertake initial gas testing, confirms that the space is Safe,
- Set the NCP to work by handing over all general safety requirements that have been established.
- ensure all persons entering the confined space are competent to do so,
- ensure that the users of gas detectors are trained in their use and recognise restrictions on their use.
- ensure the Confined Space Entry Certificate is signed by the appropriate person based on the approval level.

Nominated Competent Person (NCP)

The NCP in charge of the work/testing **MUST** ensure that:

- a Confined Space Entry Certificate has been completed and approved.
- they adhere to, and instruct others under their charge to adhere to, all conditions, instructions or limits contained within the Confined Space Entry Documentation set.
- where identified, using the hazard identification process ensure that the atmosphere is monitored throughout the work by using the appropriate gas detector.

- where forced ventilation has been provided, safety critical tags are attached as appropriate; the ventilation monitored and if this ventilation fails personnel working in the space are evacuated as quickly as possible,
- all entrants are immediately withdrawn in the event of a gas detector or other monitoring devices showing a reading in excess of the alarm or action level and that no further entry takes place until the cause of the alarm has been investigated and specific authorisation to re-enter been received from the Senior Authorised Person**.**

Safety Watch

The Safety Watch is a trained and competent person who is assigned to remain on the outside of and in close proximity to the confined space.

- they should be capable of being in continuous communication with those inside the confined space.
- where possible they should be able to observe those within the confined space.
- they are responsible for the initiation of the emergency response procedures.
- they should operate and monitor equipment used to ensure safety during entry and work in the confined space.
- they **MUST** ensure that the Confined Space Sign-On Register is accurately maintained throughout the duration of the work.
- they **MUST** undertake the monitoring and recording of atmospheric conditions using the Confined Space Atmospheric Condition Card to record results.
- they **MUST** ensure that required signage is in place and maintain the integrity of safety equipment and barriers associated with the confined space.
- they should be aware of any external hazards that may affect the integrity of the confined space.
- **they MUST not enter the Confined Space.**

8.0 Additional Confined Space Documents

Confined Space Entry Certificate DMS 10000015154
Confined Space Atmospheric Conditions Card DMS 10000019384
Confined Space Visitor Briefing Sheet DMS 10000019385
Confined Space Workflow Chart DMS 10000023836
Protect @ Contact Essentials, Confined Space. DMS 10000023828