

Chapter 2 – Prepare For Confined Space Operations



Once the job has been assessed and the relevant permits obtained you can prepare for the confined space operations. This includes implementing any hazard control strategies outlined in the permit and selecting and inspecting the required equipment and tools.



Implement Hazard Control Measures

Implement the hazard control strategies outlined in the confined spaces work permit before you begin the work. This could include:

- Placing a standby person outside the confined space to respond in an emergency
- Placing barriers and safety signs to stop unauthorised entry
- Isolation, tagging and lockout procedures for liquid, gas, electric current or other stored energy
- Purging gasses and ventilation of the confined space
- Using protective equipment and apparatus
- Any other requirements outlined in the confined space entry permit, AS2865 or other relevant sources.



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Stand-By Personnel

Before any workers enter a confined space make sure all necessary safety procedures and standards have been followed including hazard identification and control.

Make sure you have effective emergency procedures in place and that all personnel are aware of them. Rescue equipment should be positioned close to the point of entry and prepared ready to be used and all rescue workers should be fully trained.

A **Standby person** should remain as close as possible to the confined space.



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Stand-By Personnel

A standby person should:

- Be fully trained and competent
- Be in continuous communication and (if possible) visual contact with those inside the confined space
- Be ready to immediately initiate emergency response procedures
- Be continually monitoring hazards both inside and outside the confined space
- Maintain clear access and egress (entry and exit)
- Not be involved in any other work while personnel are within the confined space



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Stand-By Personnel

The standby person should not attempt to enter the confined space, unless properly trained and equipped to deal with an emergency. There should also be another standby person outside the confined space to help them if they should require assistance.



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Implement Environmental Protection Requirements

Before any work is carried out you must make sure the relevant environmental protection requirements are in place according to site procedures. Check the confined spaces work permit for details of what is required to maintain the lowest possible impact on the environment.



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Select And Inspect Equipment

The equipment you use while working in a confined space will depend upon the work you are required to do and the controls and strategies you are going to put in place. These may include:

- Safety equipment
- Rescue equipment
- Atmospheric testing equipment such as portable gas detectors and monitors
- Signs, and barricades
- Communication devices
- Tools and equipment relevant to the work to be performed

Torches and communication equipment should be safe to use in a confined space.



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Communication Equipment

Communication equipment can include mobile phones or two way radios.

Fixed frequency two way radios are a system that stops other radios using a selected frequency.



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Safety Equipment

Lifting and Lowering Devices

Lifting and lowering devices include safety belts, harnesses, tripods, ropes and lifelines

Fire Suppression Equipment

Fire suppression equipment could include fire blankets and fire extinguishers.

Personal Protective Equipment (PPE)

PPE may include:

- Eye protection (e.g. goggles)
- Ear protection
- Gloves
- Clothing
- Helmets
- Safety footwear
- Respirators and masks



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Safety Equipment

Respiratory Equipment

Where the hierarchy of hazard control measures cannot provide a concentration of oxygen in the confined space greater than 19.5%, or any airborne contaminant cannot be safely reduced or removed, workers must be equipped with supplied-air respiratory protection and PPE.

Respiratory protection devices include:

- Air purifying respirators
- Self contained compressed air breathing apparatus (SCBA)
- Supplied airline breathing apparatus
- Escape breathing apparatus



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Safety Equipment

Before you use any kind of breathing apparatus you need to make sure it is in proper safe working order. You are relying on this equipment to keep you alive – don't take any chances! All equipment inspections should adhere to procedures.

Procedures may include:

- Relevant workplace procedures
- Work instructions
- Temporary instructions
- Relevant industry and government codes and standards.

Check with your supervisor if you are unsure about any workplace procedures.



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Safety Equipment

Atmospheric Testing and Monitoring Equipment

Each gas testing instrument needs to be:

- Calibrated according to the manufacturer's instructions.

Instruments that are out of calibration or that fail field checks cannot be used for atmospheric testing until they are properly calibrated.

- Calibrated by the manufacturer annually.
- Field checked immediately prior to use. The field check needs to include checking with a test gas as per the manufacturer's instructions.



Safety Equipment

Atmospheric testing and monitoring equipment includes:

- Instruments used for pre-entry testing appropriate to the hazards
- Continuous monitors appropriate for the hazards
- Other devices used to test the confined space atmosphere as required by the permit conditions.



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Rescue Equipment

There is always the chance of an emergency such as a worker falling unconscious, a fire breaking out or a chemical spill when working in a confined space.

It is vital that you have a plan in place and adequate incident response equipment on hand. All rescue personnel should be trained in their use.

Anybody involved in an emergency response must be made aware of the conditions and the number of people in the confined space before attempting to enter it.

The rescue equipment should be set up and ready to go near the confined space.



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Rescue Equipment



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Rescue Equipment

(including rescue lines used to evacuate injured workers from a confined space)



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First Aid Kits



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Fire Suppression Equipment



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Spill Kits



Inspect Equipment And Report Faults

Before you use any equipment, tools or plant you MUST check that they are in safe working order.

If you find anything wrong during your checks you must:

1. Tag and isolate the damaged or defective
2. item to stop anybody using it.
3. Record the problem in the logbook or on the inspection checklist. Give as much detail as possible.
4. Report the fault to your supervisor or other authorised person



Prepare The Confined Space For Entry

You will need to check that the work site has been prepared in accordance with specified work permit conditions including:

- Mechanical/electrical/other energy sources and process isolations
- De-energising all sources of energy/pressure
- Purging of lines
- Lock out/tag out procedures
- Blinding/blanking lines

The results of these checks should be reported to appropriate personnel.

The confined space must be made ready for entry in compliance with workplace procedures, relevant legislation requirements and AS2865.



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Conduct Atmospheric Testing

The air inside a confined space should be tested before any workers enter. If work stops for a long period of time (e.g. over an hour) the space will need to be tested again. The person conducting the atmospheric testing must have written authority.

Before a person enters a confined space make sure:

- The confined space contains an oxygen level of 21%
- The atmospheric contaminants in the confined space are reduced to a safe level
- There are no temperature extremes
- The concentration of flammable gasses in the atmosphere is below 5 percent of its Lower Explosive Limit (LEL)

The **Lower Explosive Limit (LEL)** is the concentration of flammable material in the air below which a flame will not ignite when in contact with an ignition source.



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Take Action If Readings Pose An Unacceptable Risk

If initial testing shows that the space is contaminated in any way you will need to take action. This could be done a number of ways such as:

- Purging the atmosphere by
 - Blowing air through the space; or
 - Extracting toxic gases with a suitable exhaust system; or a combination of blowing and exhausting.

Care should be taken to prevent people outside the confined space from being exposed to gas while the atmosphere inside the confined space is being purged. Care must also be taken when purging flammable gases. Do not use pure oxygen or gasses with a higher oxygen level of 21% for purging purposes. Ventilation such as exhaust fans can be used to remove hazardous gasses and contaminants. Any purging of a confined space needs to be followed up with proper ventilation procedures.



Take Action If Readings Pose An Unacceptable Risk

- Alternatively, people can enter the space if they wear an approved air-supplied respirator (self contained breathing apparatus), so long as there are no flammable gases present in the confined space.

Testing should be done prior to entering the confined space and needs to be done on a continuous basis while confined spaces operations are conducted, or in accordance with the confined spaces permit.



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Correctly Fit Personal Protective Equipment

There is no purpose in wearing a respirator if it does not fit, or is worn incorrectly. Faces are different shapes and sizes and respirators come in a variety of brands and sizes.

Correct fit and comfort are just as important as technical effectiveness.

Once a mask has been selected, the wearer must be shown how to fit it.

Correct fit of a mask requires contact with smooth skin - this makes masks unsuitable for men with beards or moustaches. Even a one day growth of a beard has been shown to allow nearly one per cent penetration of a full face-piece. This is unacceptable with very toxic or carcinogenic substances. Small beards or moustaches which fit inside the face-piece are also unacceptable as they may cause an exhalation valve to fail if a hair lodges in it.

Glasses must not be worn inside a face-piece unless they are specially designed for the purpose, as the ear pieces will prevent a good seal. These face-pieces are also unsuitable for people who wear contact lenses. Workers who wear glasses or contact lenses should be supplied with air-supplied hoods or helmets.



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Confirm Atmospheric Testing Results Before Entering The Confined Space

Always confirm that the results from the atmospheric testing show that the confined space is safe for entry before you begin work. If the test results are inconsistent or inconclusive you must make sure further testing is completed with different and/or re-calibrated equipment.



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Confirm The Confined Space Is Ready For Entry

Before entering the confined space make the following checks:

- Isolations are complete and appropriate
- Isolation provide positive isolation
- Atmosphere is safe (or if necessary relevant measures are in place to ensure safe entry into an unsafe atmosphere)
- Safe entry and exit methods are in place
- Other items to ensure compliance with procedures, permits, relevant legislation and AS2865 are in place.



If you find that the confined space is not ready for entry you may need to report the deficiencies to an authorised person to be fixed and you may refuse to enter the confined space until the situation is corrected.



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