



SOUTHERN PORTS

ALBANY BUNBURY ESPERANCE

**CONFINED SPACE ENTRY
PROCEDURE – ESPERANCE**

DOCUMENT CONTROL

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Important Summary Points.

- All person undertaking tasks associated with a Confined Space including but not limited to, Permit Authoriser, Permit Holder, Standby Persons, persons entering and working in a Confined Space and emergency response team members shall hold a current nationally unit of competency for Entry and Work in a Confined Space.
- Personnel who may be required to work in a potential Confined Space will need to assess if there is a risk of unsafe oxygen ranges, dangerous gases, engulfment, fire and/or explosion before commencing the task.
- A Confined Space Permit authorised by a Superintendent, Mechanical Supervisor or Electrical Supervisor shall be obtained by the Permit Holder (the person who is supervising the works) prior to any work being undertaking in a Confined Space.
- An appropriately trained and appointed Standby Person shall remain outside of the Confined Space at all times while work is being conducted.
- A clear continuous method of communication between the appointed Standby Person, emergency personnel and persons within the Confined Space shall be agreed prior to work commencing.
- A safe clear access and egress shall be established to and from the Confined Space and that it shall be maintained at all times.

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1. PURPOSE

The purpose of this procedure is to provide information and guidance as to the minimum standards for Confined Space Entry in the workplace. This procedure addresses the assessment of hazards, authorisation and preparation for entry, work within the Confined Space, including stand-by duties and the emergency response arrangements to ensure Confined Space entries are conducted in a safe and competent manner.

2. SCOPE

All personnel accessing Southern Ports worksite are required to comply with this Procedure, including employees, contractors and port users.

Should contractors' or port users' standards exceed the requirements outlined in this Southern Ports procedure, then the contractors' or port users' standards shall apply once a Risk Assessment (RA) has been undertaken and approved.

3. GENERAL INFORMATION

A Confined Space is an enclosed or partially enclosed space that is not intended or designed primarily for human occupancy. Confined Spaces often have poor ventilation, which allows hazardous atmospheres to develop quickly. The hazards are not always obvious and may change from one entry into the Confined Space to the next or, as a result of the task being conducted in or adjacent to the Confined Space.

The risks of working in Confined Spaces include loss of consciousness, impairment, injury or death resulting from circumstances including, but not limited to:

- The immediate effects of airborne contaminants;
- Fire or explosion from the ignition of flammable contaminants;
- Oxygen deficiency;
- Immersion in a free-flowing material, such as but not limited to grain, woodchips, minerals, fertiliser, water or other liquids;
- Falls from a height;
- Environmental factors, such as but not limited to heat and humidity;
- Poor lighting; and
- Manual handling.

4. PROCEDURE

4.1. General Requirements

All Confined Spaces, which personnel may need to enter, are to be registered on the Southern Ports – Esperance (SP-Esp) Confined Space Register. A Confined Space Evaluation shall be conducted to identify the hazards, assess the risks and to identify the required controls for the Confined Space. In addition, a Confined Space Emergency Response Plan shall be developed and communicated prior to entry into a Confined Space

Individuals who may be required to work in a potential Confined Space will assess if there is a risk of unsafe oxygen ranges, dangerous gases, engulfment, fire and/or explosion before commencing the task.

All entry points to Confined Spaces must have a hard barrier and danger signage installed to mitigate unauthorised entry.

Prior to undertaking works in a Confined Space, the Permit Holder (the competent person who is supervising the works) shall obtain a Confined Space Permit authorised by a Superintendent,

Mechanical Supervisor or Electrical Supervisor. An appropriately trained and appointed Standby Person shall remain outside of the Confined Space at all times while work is being conducted.

A clear continuous method of communication between the appointed Standby Person, emergency personnel and persons within the Confined Space shall be agreed prior to work commencing.

A safe clear access and egress route shall be established to and from the Confined Space and it shall be maintained at all times.

Where the work to be performed in the Confined Space includes at risk activities such as, but not limited to, Working at Heights or Hot Work then the respective procedures and authorised permits shall also be adhered to.

4.2. Training and Competence.

All persons undertaking tasks associated with a Confined Space including but not limited to, Permit Authoriser, Permit Holder, Standby Persons, persons entering and working in a Confined Space and emergency response team members shall hold a current national unit of competency for Entry and Work in a Confined Space.

Persons conducting pre entry gas testing of the atmosphere in accordance with a Confined Space permit shall hold a current national unit of competency of Gas Test Atmosphere.

Persons shall undertake refresher training every two years.

4.3. Risk Assessment

A risk assessment shall be conducted on all Confined Spaces and on work undertaken within a Confined Space. The Confined Space Evaluation and Confined Space Emergency Response Plan are the tools to be used to identify the hazards, assess the risks and identify the required controls for a Confined Space entry.

A Job Hazard Analysis (JHA) or Safe Work Instruction (SWI) shall be conducted by the personnel undertaking work within a Confined Space to identify the hazards, assess the risks and to identify the required controls for all work requiring a Confined Space Permit. The JHA or SWI shall also consider hazards that may be introduced into the Confined Space as a result of the work being conducted.

4.3.1. Reclassification of a Confined Space (Maintenance purposes only)

A Confined Space may be reclassified as a Non-Permit Confined Space when it has undergone sufficient changes in structure or usage to eliminate, all possible sources of the inherent hazards that define a Confined Space.

Reclassification of a Confined Space can only occur under the following circumstances –

- The area is not used for the storage or transfer of hazardous material, such as but not limited to sulphur.
- There is no possibility of engulfment such as but not limited to, hang-ups within the space and product on a conveyor belt that feeds into the space.
- The physical characteristics of the space have been significantly modified so that access to the space is not restricted, for example: the chute hood and spoon assembly are completely removed prior to entry.
- The physical characteristics of the space have been significantly modified to eliminate the enclosed or partially enclosed nature of the space, such that a safe atmospheric condition is maintained without the need for any risk control measures (e.g. forced ventilation).
- Access is required for Maintenance purposes only (Not for cleaning, unblocking chutes or removing of hang-ups).

- All inherent hazards have been controlled, including but not limited to isolation, lockout and tag out of conveyors, augers, dust suppression systems and potential stored energy.
- The task being conducted will not introduce hazards into the space, such as but not limited to solvents, glues, bonding agents, oxy / acetylene.
- A JHA or SWI has been completed for the task being undertake within the space.
- A Reclassification Evaluation form has been completed and authorised by a Superintendent, Mechanical Supervisor or Electrical Supervisor.
- On completion of the works, the Confined Space status of the space is re-established and the work group removes all hazard controls.

Note: Vessels such as classified plant and pressure vessels are unlikely to be reclassified because they cannot be structurally modified. These vessels will remain as Confined Spaces.

4.3.2. Risk Control Measures - Isolations

Prior to entry and work being conducted in a Confined Space de-energise, isolate and lock out all equipment such as but not limited to, piping ,ducts, vents, drains, conveyors, service pipes or fire protection and dust suppression equipment which introduce materials into a Confined Space.

All machinery including but not limited to, mixers, agitators conveyors or other equipment containing moving parts in the Confined Space shall be de-energised, isolated and locked out before entry is made into a Confined Space. This may include additional isolation, blocking, retention of counter weights, or clamping of the machinery itself to guard against the release of stored energy.

Isolation shall be undertaken in accordance with the Southern Ports Isolation and Tagging Procedure. The SP-Esp Isolation Guide, Isolation Confirmation Permit and JHA or SWI for the work being undertaken shall be used to determine the appropriate isolations.

No ignition sources are to be introduced into the Confined Space from outside or within the Confined Space if there is a possibility of fire or explosion.

Where applicable, the Isolation Confirmation Permit shall be attached to the Confined Space permit.

4.3.3. Purging, Cleaning and Decontamination

When applicable, a Confined Space shall be cleared of non-flammable airborne contaminants using a suitable purging agent such as air or nitrogen.

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

Substances including purging agents that are likely to be hazardous shall be removed prior to entry. The equipment used for purging and ventilation of flammable contaminates shall be designed for use in explosive gas atmospheres.

When practicable, a Confined Space shall be cleaned from the outside, eliminating the need for entry.

4.4. Atmospheric Testing and Monitoring

Testing and monitoring of the Confined Space atmosphere shall be conducted prior to and during a Confined Space entry. The atmospheric test will include but not limited to, oxygen, gases, flammable contaminants, and potentially harmful substances.

The Authorised Gas Tester shall be a competent person who is able to understand the measurement technology, record and interpret the results in an accurate, consistent and reliable manner.

Testing and monitoring devices shall be intrinsically safe, calibrated to the manufacturer's specifications and functionally checked before and after each use. Prior to testing a Confined Space atmosphere the gas detecting equipment will be started in fresh air and a functional test conducted to verify the operation of the sensors, alarms and calibration status.

Gas test and monitoring equipment shall be calibrated by a competent person every 180 days. In addition, the equipment will be Bump Tested after each use, before being placed back into service.

Atmospheric gas testing shall be conducted and recorded on the Confined Space Permit:

- Prior to authorisation of a Confined Space Permit,
- Prior to initial entry,
- Prior to re-entry if the space has been unoccupied for a period. The requirement of re-entry gas testing shall be determined by the Gas Tester based on the inherent risks associated with the space and the work being conducted in or around the space, and
- When applicable, at the periodicity nominated in the Confined Space Permit.

Initial gas testing should be done from outside the Confined Space by inserting a sample probe and/or portable gas detection device at appropriately selected access holes, nozzles and openings. Because contaminants can settle at different levels, each part of the Confined Space should be tested—side-to-side and top to bottom

The table below provides guidance on the minimum conditions required before entry, including the gas test equipment alarm levels.

	LEL (CH ₄)	O ₂	H ₂ S	CO	SO ₂
Safe Entry	Below 5%	20 – 23%	0-9ppm	0-29	0ppm
Low Alarm Level	5%	19.5%	10ppm	30	1ppm
High Alarm Level	10%	23.5%	15ppm	60	2ppm

If an acceptable gas test can only be obtained or maintained with the forced ventilation on, then the power supply to the ventilation system must be included on the isolation list and tagged to safeguard personnel in the Confined Space.

4.5. Ventilation

When ventilation of the Confined Space is required, the means of ventilation must be secured e.g. doors secured open, exhaust fans secured in the appropriate position. The means of ventilation must not be obstructed.

When considering what ventilation system to adopt, it is important to understand the reasons for ventilating the Confined Space being:

1. To maintain the level of oxygen within a range of 19.5 to 23.5%;
2. To remove flammable air contaminants; or
3. To remove toxic air contaminants.

When developing a ventilation plan the following should be considered:

- Previous Contents – If the Confined Space is a process or storage vessel, has it been drained and cleaned? The more residues that can be removed the less effort that will be required to achieve adequate ventilation.

- Internal Obstructions – Are there baffles or obstructions that will adversely affect airflow? If so, ensure the ventilation system is adequate to remove contaminants from pockets and dead ends.
- Existing Openings – The number, location and relative position of all openings into the vessel should be noted. These openings may be used either for exhausting contaminants out of the space or for drawing make-up air in.
- Natural Drafts – Draft patterns through the openings of a vessel will influence the positioning of air moving equipment.

4.5.1 Supply versus Exhaust Air Ventilation

The decision on whether to force air into the space or exhaust depends largely on the nature of the space and the contaminants that are likely to be present. Forcing air into a space may create turbulence, which can agitate gases and vapours and evaporate residue. Positive ventilation is appropriate where contaminant levels are relatively low.

Consideration must be given to the concentration of contaminants that may exist in the exhausted air, which could adversely affect workers in adjacent areas.

- Location of Ventilation System – The location of the blower or exhaust ventilator should ensure that make-up air is drawn from a fresh air source. The vapour density of the contaminant must be considered.
- Welding – if welding or allied processes are to occur within the Confined Space, consider the flammability and thermal decomposition products of the coating material, and endeavour to have the inlet point to the exhaust as close as possible to the source of contamination.
- Conveyor Belt or Lining Repairs – Will the work being undertaken in the space introduce an atmospheric hazards into, or change the work environment within the space, which may adversely affect the health and safety of the occupants?

4.6. Standby Person

The Standby Person is a competent person assigned the responsibility for the well-being of those inside the Confined Space. The Standby shall remain outside of, and in close proximity to, the Confined Space and be capable of being in continuous communication with and, if practical, observe those inside.

The Standby shall:

- Conduct and record atmospheric oxygen and gas testing in accordance with the Confined Space Permit, monitoring any conditions external to the space that may affect the health or safety of the persons within the Confined Space including but not limited to; exhaust gases produced by generators or mobile plant operating in the area, services supplied into the space and ventilation equipment.
- Monitor the environmental conditions internal to the space that may affect the health or safety of the persons within the Confined Space including but not limited to, heat and humidity.
- Ensure that all access and egress points of the Confined Space are kept clear and unobstructed at all times.
- Not enter the Confined Space or perform any other duties that may impede on their attention from the wellbeing of those inside the Confined Space.
- Have a serviceable and authorised method of communication to initiate the rescue plan should an emergency occur.

- Ensure that all personnel entering the Confined Space 'Sign In' and 'Sign Out' of the Confined Space Permit (Section 5 Entry and Exit Log).
- Be responsible for managing equipment associated with the Confined Space entry and should know what tasks are being performed inside the Confined Space at any time.
- In the event of an emergency initiate emergency response and conduct a 'non entry' rescue if safe to do so.

4.7. Communications

A means of communication between the Standby and those persons accessing the Confined Space must be established and maintained. The system for communicating an evacuation to those entrants must be agreed before any personnel enter the Confined Space. In addition, the Standby must have an appropriate means of VHF radio communications to initiate a call for emergency response.

Note. For Confined Space entries within the sulphur circuit intrinsically safe Class T4 radios shall be used, mobile phones are not permitted.

4.8. Signs and Barriers

A sign indicating that work is being undertaken in the Confined Space and appropriate barriers must be in place for any Confined Space entry for the purpose of preventing personnel not involved with the work from entering the Confined Space.

4.9. Personal Protective Equipment

In addition to the Personal Protective Equipment (PPE) required for the task being conducted in a Confined Space, a Confined Space safety harness that complies with AS 1891 shall be worn where:

- There is a risk of falling from or through one level to another; or
- Rescue by a direct route, vertical or horizontal is possible.

If wearing a safety harness introduces additional hazards, their use shall be risk assessed and mitigation controls shall be specified on the authorised Confined Space permit for that entry.

When applicable, personnel entering a Confined Space that does not have a proven safe atmosphere, must wear SCBA and be competent in its use. The selection, use, storage, inspection and maintenance of the SCBA must be in accordance with AS 1715, and all supplied air respiratory protective equipment must comply with AS 1716.

4.10. Electrical Equipment

Portable electrical equipment shall be:

Connected (individually or collectively) to an earth-free, protected extra-low voltage (< 50 VAC or 120 VDC) supply from an isolating transformer outside the Confined Space, or protected through a Residual Current Device (RCD) which complies with AS 3190 and is located outside the Confined Space.

Where an installed RCD is not situated at the power outlet to be used, a portable RCD device shall be used and located external to the space, the RCD device shall be tested by the operator prior to use.

Intrinsically safe electrical equipment including but not limited to, Class T4 headlamps and radios shall be used where there is potential for flammable substances to be present in a Confined Space.

Electrical equipment shall be provided according to AS 3100 and installed to AS 3000.

Lighting shall be battery powered or 32 V supply, where practicable;

Where available, it is recommended that brushless cordless powered or double insulated electrical tools be used; and

Wherever practicable, cables for lights and other equipment shall be fed into the space via an entry separate to the one used by people. Where practicable electrical cables entering a Confined Space should be suspended or additional protection put in place to prevent physical damage to the cables.

4.11. Hot Work

Hot Work including but not limited to, welding, grinding or oxy-acetylene operations being conducted within a Confined Space shall be undertaken under both the Confined Space and Hot Work permits authorised by the Superintendent, Mechanical or Electrical Supervisor.

Where Hot Work is being conducted in a Confined Space one Standby Person may assume the roles of both Hot Work Sentry and Confined Space Standby Person, if determined safe to do so in the JHA or SWI for the work.

While undertaking hot works within the Confined Space an extraction ventilation system may be required to be established directly at the hot works location to ensure that a safe atmosphere is maintained during the hot work activity.

4.12. Other Equipment

Where practicable, non-sparking tools shall be used where there is potential for combustibles in the space including but not limited to sulphur or fertilizer.

Except for use with Self-Contained Breathing Apparatus (SCBA), no cylinder of compressed or liquefied gas shall be taken into a Confined Space. Gas hoses shall be leak-tested before use in the space and located, suspended or otherwise guarded to prevent accidental damage. The hoses should be removed during meal or rest breaks and at the completion of work. Refer to AS 1674 Safety in welding and allied processes.

Combustible engines, vehicles and generators operating close to the opening of the Confined Space can cause a build-up of exhaust gases, including carbon monoxide, in the space. The possible impact of combustion engine in the vicinity of a Confined Space entry must be assessed by the work group when reviewing the JHA or SWI for the works and the required control actions shall be implemented prior to entry.

5. RESCUE PROCEDURES

The Confined Space Emergency Response Plan shall be developed and documented in consultation between the Supervisor, persons undertaking work in a Confined Space and the site Emergency Services Coordinator. A Confined Space Emergency Response Plan specific to the Confined Space shall be attached to the Confined Space Permit.

The Emergency Response Plan shall detail the appropriate equipment for emergency response including but not limited to, breathing apparatus, lifting frame, stretcher, haulage and belay systems for safe access and the extraction of an incapacitated person from the Confined Space.

Workers performing a rescue must be adequately trained, and must be provided with air-supplied respiratory protective equipment if they enter a Confined Space in an emergency in which:

- The atmosphere in the Confined Space does not have a safe oxygen level, or
- The atmosphere in the space has a harmful concentration of an airborne contaminant, or
- There is a serious risk of the atmosphere in the space becoming affected in the way referred to above while the worker is in the space.

The current Confined Space Rescue Plans are document controlled and accessible in My Port.

6. DEFINITIONS

Term	Definition
<p>Authorised Gas Tester</p>	<p>A person who is trained and competent to understand the measurement technology, record and interpret the results in an accurate, consistent and reliable manner.</p> <p>Note: Persons conducting pre-entry gas testing of the atmosphere in accordance with a Confined Space permit shall hold a current national unit of competency of Gas Test Atmosphere.</p>
<p>Confined Space</p>	<p>AS2865:2009 1.5.5</p> <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"> (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. <p>Enclosed or partially enclosed spaces that may meet the definition criteria for a Confined Space are:</p> <ol style="list-style-type: none"> 1. Storage tanks, tank cars, process vessels, boilers, pressure vessels, silos and other tank like compartments; 2. Pipes, sewers, shafts, degreaser and sullage pits, ducts and similar structures; and 3. Any shipboard spaces entered through a small hatchway or entry point, cargo tanks, cargo holds, cellular double bottom tanks, duct keels, ballast and oil tanks, and void spaces. <p>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.</p> <p>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.</p> <p>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</p>

	<p>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.</p> <p>A rising level of a liquid 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.</p>
Confined Space Entry	When a person's breathing zone, consisting of upper torso and head, is within a Confined Space, the person is considered to have entered the Confined Space.
ERT	Emergency Response Team (On-site)
Hot Work	<p>Hot Work is work which may create sufficient energy to ignite flammable gases or combustible dusts. The following are some examples of Hot Work:</p> <ul style="list-style-type: none"> • Welding, soldering • Fires or naked flames • Non-flameproof electrical equipment requiring batteries, ramset guns, explosive items, radioactive sources, including cameras, radios, mobile phones, torches and pagers (except low energy or totally enclosed devices e.g. hearing aids, watches) • Power cutting and drilling • Hand tools that may create a spark • Spark ignition or non-approved combustion ignition engines in operations areas and tank compounds • Work on live electrical conductors and opening live electrical enclosures. <p>All welding, grinding and allied work shall comply with AS 1674 Safety in welding and allied processes.</p>
Risk Assessment	May includes but not limited to a operational Risk Assessment compliant with ISO 31000, Job Hazard Analysis (JHA), Stop & Think or a combination of, for the purposes of identifying hazards and the required controls to minimise risk to safety, health, environment and community.
Standby	A competent person assigned to remain on the outside of, or in close proximity to, a Confined Space, and in continuous contact with those inside, to initiate rescue procedures and operate equipment used for entry to the Confined Space, where necessary.
SCBA	Self Contained Breathing Apparatus
Should, May	Recommended
Shall, Will, Must	Mandatory

Permit Holder	The competent person supervising work being conducted in a Confined Space.
Permit Authorisor	A Superintendant, Mechanical Supervisor or Electrical Supervisor who is the responsible person in control of the workplace.

7. RELATED LEGISLATION AND DOCUMENTS

The applying legislation and documents include, but are not limited to the following:

- Mines Safety and Inspection Act 1994 (WA)
- Mines Safety and Inspection Regulations 1995 (WA)
- Occupational Safety and Health Act 1984 (WA)
- Occupational Safety and Health Regulations 1996 (WA)
- AS/NZS 2865:2009 Safe Work in a Confined Space
- Code of Practice Confined Spaces (Safe Work Australia)
- AS/NZS 1715 Selection, Use and Maintenance of Respiratory Protective Equipment
- AS/NZS 1891 Industrial fall-arrest systems and devices
- AS/NZS 1891.1 Industrial fall-arrest systems and devices – Harnesses and ancillary equipment
- AS/NZS 3190 Approval and Test Specifications – Residual Current Devices

Internal Documents:

- SP Isolation and Tagging Procedure D16/695
- SP-Esp Confined Space Register
- SP-Esp Confined Space Evaluation and Emergency Response Plan
- SP-Esp Confined Space Permit – Esperance D16/654
- SP-Esp Confined Space Temporary Reclassification D20/3678
- SP-Esp Permit to Work Procedure D16/10