Confined Space Procedure

Purpose

The purpose of this Procedure is to effectively manage the health and safety of all persons who enter or work in a confined space.

This procedure describes the minimum requirements to enter and/or work safely in a confined space.

Scope

This Procedure specifically applies to the asset management of confined spaces that are under Queensland Hydro's management and control and work undertaken by Queensland Hydro employees in a confined space as defined the *Work Health and Safety Regulation 2011*.

This procedure also applies to Contractors when working under the Queensland Hydro Health and Safety Management System (HSMS) or when directed under Contract.

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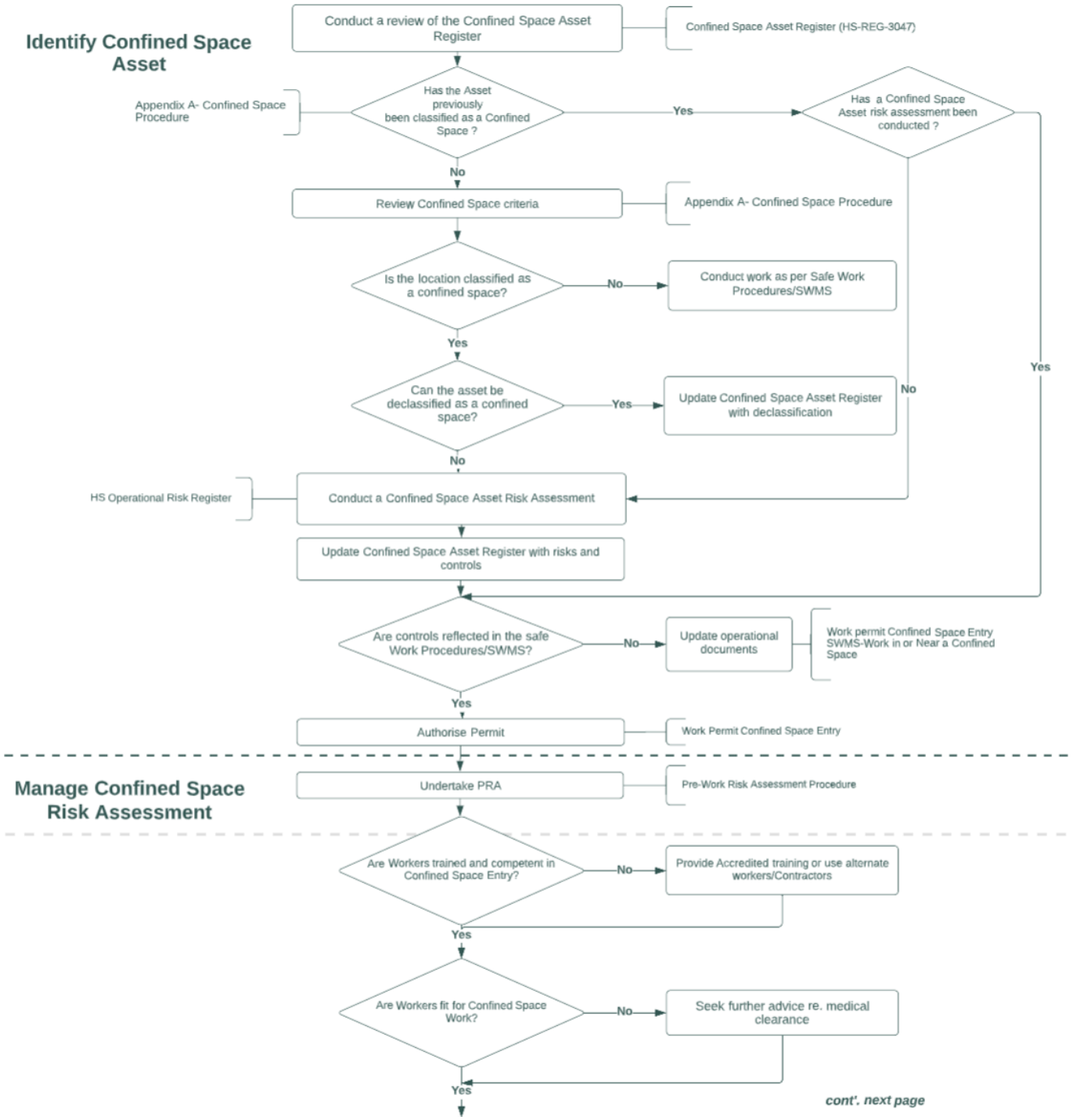
Process Map


Identify Confined Space Asset
Conduct a review of the Confined Space Asset Register
Confined Space Asset Register (HS-REG-3047)
Appendix A- Confined Space Procedure
Has the Asset previously been classified as a Confined Space ?
Yes
Has a Confined Space Asset risk assessment been conducted ?
No
Review Confined Space criteria
Appendix A- Confined Space Procedure
Is the location classified as a confined space?
No
Conduct work as per Safe Work Procedures/SWMS
Yes
Can the asset be declassified as a confined space?
Yes
Update Confined Space Asset Register with declassification
No
Yes
No
HS Operational Risk Register
Conduct a Confined Space Asset Risk Assessment
Update Confined Space Asset Register with risks and controls
Are controls reflected in the safe Work Procedures/SWMS?
No
Update operational documents
Work permit Confined Space Entry
SWMS-Work in or Near a Confined Space
Yes
Authorise Permit
Work Permit Confined Space Entry
Manage Confined Space Risk Assessment
Undertake PRA
Pre-Work Risk Assessment Procedure
Are Workers trained and competent in Confined Space Entry?
No
Provide Accredited training or use alternate workers/Contractors
Yes
Are Workers fit for Confined Space Work?
No
Seek further advice re. medical clearance
Yes
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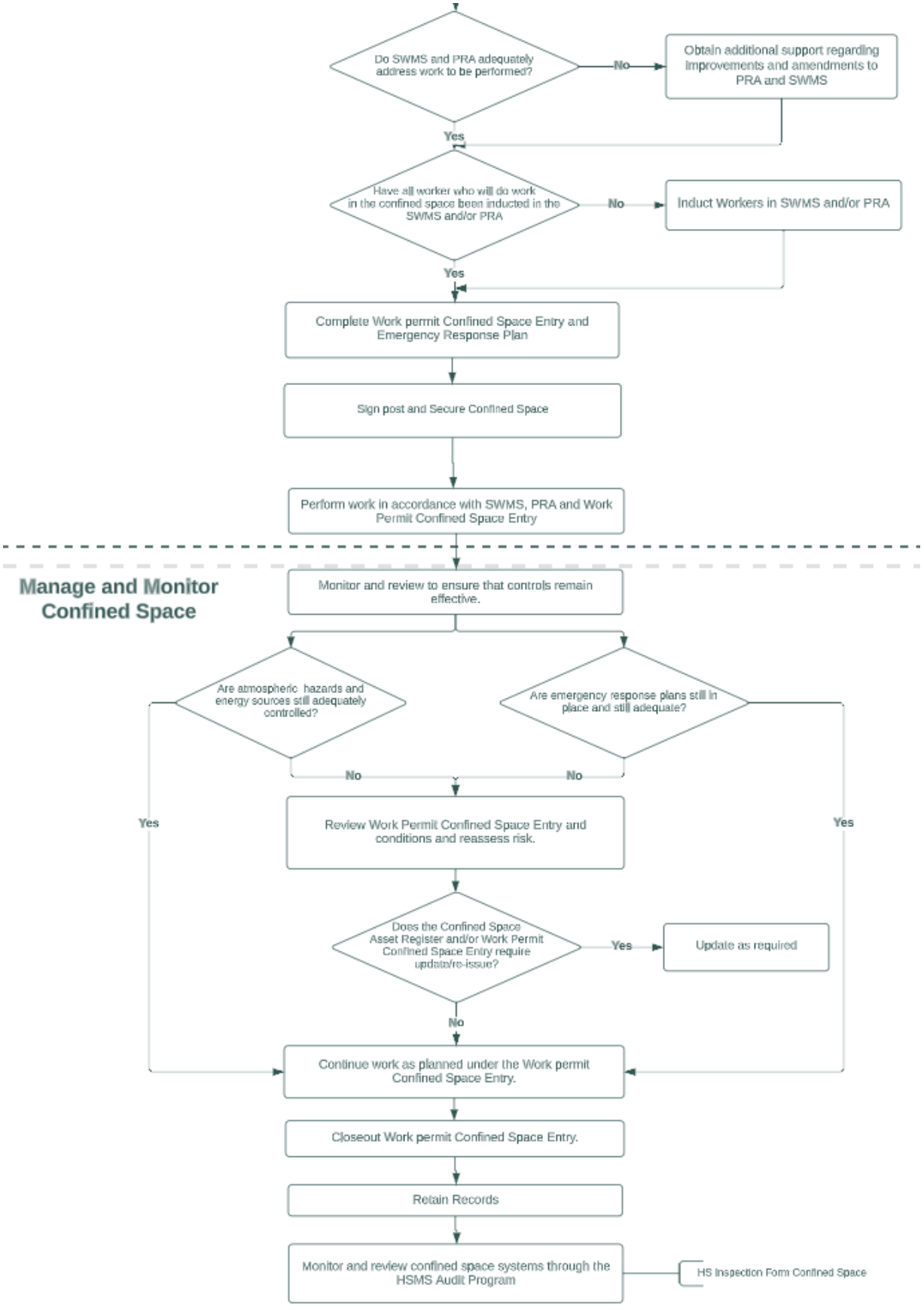

Confined Space Entry Procedure

Procedure

1 Critical Controls

Critical Controls for Confined Space Entry	
Critical Controls	Objective
A safe atmosphere must be established, monitored and maintained	To maintain a safe atmosphere in Confined Spaces where Workers are present
All sources of damaging energy must be considered and managed prior to entry	To remove risk of engulfment and maintain a safe atmosphere where Workers are present
A standby person must be present and maintain effective communications with people in a confined space at all times	To raise the alarm and effect rescue
Confined spaces must be locked and/or secured against inadvertent/ unauthorised entry	To prevent inadvertent/ unauthorised entry into the confined space
A properly resourced emergency response plan must be in place	To remove Workers safely and in a timely manner in event of an emergency

2 Planning

2.1 Identification of a Confined Space

Workers must confirm if a space they are intending to enter is, or is not, a Confined Space, before they enter the space. Confined Spaces may be identified by one or more of the following:

- A Confined Space sign located at the entrance to the space; or
- The space is listed in the Confined Space register for the site.

Where a space is not listed on the Confined Space register or signposted but there is the potential for it to be a confined space, an assessment is to be undertaken using the form **Confined Space Determination HS-FRM-0041.** The assessment should be undertaken by a member of the H&S team and a member of the work party, provided both workers hold a current *RIIWHS202-Enter and work in confined space* qualification. The outcome of this assessment is to be documented in the relevant confined space register.

2.1.1 Confined Space Register

All Confined Spaces identified at Queensland Hydro workplaces must be recorded on a Confined Space register. The Confined Space register must be made available at all sign-in facilities for the workplace. Confined Space registers must be audited at least every five years or when any significant changes to structures occur at the workplace. The audit will be conducted by the H&S team with support from the relevant site team.

2.1.2 Confined Space Signage

All registered Confined Spaces at Queensland Hydro workplaces, where practicable, must have a sign attached to the space in clear view of each entrance point. Confined Spaces with entrances in roadways or other areas where a sign would be regularly damaged may not be signed. Alternate methods of identification (i.e. painting) should be investigated for these types of Confined Spaces.

2.1.3 Declassification of a Confined Space

Where a Confined Space register audit or other assessment results in a recommendation to de-classify an existing Confined Space, the recommendation must be accompanied by a documented risk assessment that justifies the reasons for the declassification. Temporary risk control measures such as providing temporary ventilation or achieving a satisfactory pre-entry gas test will not result in a Confined Space being declassified.

For a Confined Space to be declassified, it must have undergone sufficient changes in structure and use, to eliminate all inherent hazards that define a Confined Space. The declassification of any Confined Spaces must be approved by the Head of HS. Following declassification, any Confined Space signage must be removed from entrances to the space and the details of the space must be amended in the Confined Space register.

2.2 Eliminating Confined Space Entry

Alternate work methods should be considered, where practicable, to eliminate the need for a person to enter a Confined Space to undertake an activity.

2.3 Competent Personnel

People involved in confined space work must have the necessary competency to undertake their role. The minimum requirement for establishing competency in confined space entry is successful completion of a recognised course provided by a Registered Training Organisation (RTO) that covers:

- Working in confined spaces; and
- Confined space rescue.

NOTE: These competencies must be renewed at intervals of not greater than **two years**.

Queensland Hydro also requires confined space rescue workers to participate in emergency rescue drills to determine the suitability of the Emergency Response Plan and the capability of rescue workers.

Workers undertaking confined space entry must be able to cope with the physiological and psychological demands of each particular confined space entry and associated activity. Consideration must be given to such aspects of each person capability as part of the planning for each confined space entry. Due to the nature of the risks associated with work in a Confined Space, all Queensland Hydro employees who are required to enter a Confined Space must undertake a Confined Space Medical examination. Workers with a current Confined Space Medical must notify Queensland Hydro if there is a change in their health status that may impact their ability to safely enter a Confined Space. If a person is unable to meet the criteria of the medical examination, a risk assessment will be undertaken to assess if they can perform the duties of the Standby Person.

3 Confined Space Entry

The key steps in the Confined Space process are:

No.	Step
1	Confirm the Confined Space Entry team
2	Conduct a risk assessment of the inherent hazards of the Confined Space, including potential emergency scenarios
3	Apply physical controls around the space (barricades, signage etc)
4	Prepare the space for entry (draining, cleaning, ventilation etc)
5	Prepare confined space entry equipment (gas detector, tripod, harnesses etc)
6	Confirm communication protocols
7	Confirm emergency procedures
8	Test the atmosphere
9	Complete and activate the Confined Space entry permit
10	Enter the Confined Space

3.1 Confined Space Entry Team

A Confined Space Entry Team must include a **minimum** of three competent Workers, consisting of:

- a Permit Holder
- a Standby Person; and
- an Entrant.

At least two members of a Confined Space Entry Team must remain outside of the Confined Space and engaged with the task at all times.

3.2 Monitoring and Communication

A minimum of one Standby Person must be assigned to continuously monitor the wellbeing of those inside the space. If practicable, the Standby Person should be able to observe the work being carried out.

The Standby Person must not leave their post under any circumstances whilst Workers are in the space.

A communication system must be confirmed prior to entering the Confined Space to ensure continuous communication between people inside and outside the Confined Space and to summon help in an emergency.

Depending on the conditions within the Confined Space, communication can be achieved by voice, radio, phone, hand signals or other suitable methods.

The Standby Person should:

- Understand the nature of the hazards inside the particular Confined Space and be able to recognise that the Workers in the space are showing unusual signs or symptoms in their behaviour or movement;
- Remain outside the Confined Space and do no other work which may interfere with their primary role of monitoring the Workers inside the space;
- Have all required rescue equipment (e.g. safety harnesses, lifting equipment, a lifeline) set up to allow for execution of the rescue plan;
- Have the authority to order Workers to exit the space if any hazardous situation arises;
- Activate the Emergency Rescue Plan if required.

The Standby Person must never enter the Confined Space to undertake a rescue.

3.3 Risk Assessment

An appropriate level of risk assessment for the work to be undertaken within the confined space shall be undertaken in accordance with **HS Risk Management Procedure (HS-PRO-0007).**

3.4 Emergency Plans

Effective arrangements for raising the alarm and carrying out rescue operations in an emergency must be prepared prior to entering a confined space and recorded on the Work Permit Confined Space Entry and SWMS.

Where possible, a rescue should be performed from outside the Confined Space.

NOTE: If a person inside a confined space has been overcome by lack of oxygen or airborne contaminants, it should always be assumed that entry for rescue is unsafe unless Self-Contained Breathing Apparatus (SCBA) is used.

All Workers involved in Confined Space work will be supplied with, and trained in the use of, appropriate emergency and rescue equipment.

3.5 Signage and Barricades

Warning signs and barriers must be erected to prevent unauthorised entry to the confined space.

Signage must be erected prior to confined space entry and remain in place for the duration of the confined space works. Additionally, warning signage must remain in-situ whenever the confined space remains open and is unattended.

Warning signs must be prominently located at each entrance to the confined space and clearly state that entry is prohibited without a valid permit.

3.6 Isolating the Confined Space

Prior to entering a Confined Space all potential sources of energy must be identified and isolated, as per **Queensland Hydro Isolation, Lock Out and Tag Out Procedure (HS-PRO-0035).**

If liquids, gases or vapours have the potential to enter the Confined Space, the pipe work delivering these Contaminants to the Confined Space must be physically isolated.

3.7 Cleaning

Once the Confined Space is isolated, any material (solid or liquid) remaining in the space that has the potential to re-contaminate the space or to interfere with the work to be undertaken shall be removed by a method that does not require physical entry.

A space may not need to be completely emptied, provided the materials remaining in the space do not pose a risk to people or equipment that cannot be reliably controlled.

3.8 Ventilation

Ventilation of a Confined Space with fresh air, by natural, forced or mechanical means, may be necessary to establish and maintain a safe atmosphere and temperature for as long as anyone is in the Confined Space.

Where mechanical ventilation equipment is likely to be necessary to maintain acceptable Contaminant levels in a Confined Space, the equipment must:

- Be monitored to ensure continuous operation while the Confined Space is occupied; and
- Have the controls (including any remote power supply) clearly identified, tagged, and protected to guard against unauthorised interference.

3.9 Atmospheric Testing

A safe atmosphere must be maintained for the duration of work in a Confine Space. A safe atmosphere in a Confined Space is one that:

- Has a Safe Oxygen Level (concentration of oxygen of between 19.5% - 23.5%);
- Is free of Airborne Contaminants or any Airborne Contaminants are below their allowable exposure standard (if any); and
- Has any flammable gas or vapour in the atmosphere at concentrations below 5% of its Lower Explosive Limit (LEL).

A competent person will determine the oxygen content, flammable gas content and levels of toxic contaminants, and record this information on the Confined Space Entry Permit. If the gas readings fall outside the acceptable ranges, the confined space **MUST NOT** be entered.

The following applies:

- The test equipment should be in calibration and bump tested prior to use;
- The test equipment must be tested in fresh air prior to use;
- The atmosphere shall be tested at the bottom, top, and middle of all confined spaces;
- The appropriate frequency of atmospheric monitoring to be undertaken during the job shall be determined during the risk assessment process;

- If the confined space is left for any reason, the atmosphere shall be re-tested before re-entering the space; and
- As a minimum, the atmosphere must be tested for:
  - Oxygen concentration;
  - Hydrogen sulphide;
  - Carbon monoxide; and
  - Flammable/explosive elements (methane).

The following table defines the safe levels of each element that must be attained prior to entry to a Confined Space.

Flammable/ Explosive (LEL)	Oxygen (O_2)	Hydrogen Sulphide (H_2S)	Carbon Monoxide (CO)
<5% LEL	>19.5 up to <23.5%	<10 ppm	<30 ppm

The atmosphere inside a Confined Space may need to be tested for additional elements depending on what is normally stored or introduced within the space. Testing may be required for ammonia gas, chlorine gas, carbon dioxide, etc.

3.10 Confined Space Entry Permit

A **Confined Space Entry Permit (HS-FRM-0008)** shall be completed and authorised prior to entry into the confined space. The Confined Space Entry Permit shall be displayed at the entry to the confined space along with the sign-on and sign-off sheet.

A Confined Space Entry Permit can be used for multiple entries into a space and can be used where there is more than one access point into a single space, provided the entries are all undertaken in a single shift of work.

Only Workers listed on the Confined Space Entry Permit may enter the Confined Space.

The Confined Space Entry Permit must be kept at least until the work to which it relates is completed.

3.11 Confined Space Work Management

Work or activities within the Confined Space must be undertaken in accordance with the conditions of the Confined Space Entry Permit and the SWMS. If during the duration of a Confined Space entry the work being undertaken changes, all personnel must exit the space and undertake a risk assessment for the new activities to be undertaken. Re-entry to the space can only occur when all identified risk controls are in place and a new Confined Space Entry Permit issued and the SWMS is amended where required.

A Confined Space entry or work within the space must be stopped and the space evacuated if:

- The atmosphere within the space becomes hazardous (i.e. gas detector alarm triggered);
- The personnel in the space are showing unusual signs or symptoms in their behaviour or movement;
- The Standby Person cannot maintain a watch on the space;
- There is an emergency outside of the space; or
- Any adverse conditions not captured in the risk assessment or Confined Space Entry Permit occur.

Tools and equipment used in the Confined Space must be fit for purpose and not introduce new hazards into the space (this may include intrinsically safe torches, lamps, etc.).

Where required, sources of ignition must be excluded from entry to a Confined Space. Where hot work is required in a Confined Space, a Hot Work Permit must be completed, and appropriate controls implemented prior to undertaking the hot work in accordance with the **Hot Work Procedure (HS-PRO-0016).**

3.12 Atmospheric Monitoring

Continuous Atmospheric Monitoring must be carried out by a competent person during occupancy of the Confined Space.

Should Atmospheric Testing indicate an unsafe atmosphere during occupancy, the Confined Space must be immediately evacuated, and the incident reported as per **Incident Management Procedure (HS-PRO-0026)**.

3.13 Completion of Work

Upon completion of work in the Confined Space, all plant and equipment must be removed from the Confined Space. Where relevant, the asset must be returned to service (if required) including de-isolation.

All Workers who entered the Confined Space must sign-off the Confined Space Entry Permit to confirm that they have exited the space. The Confined Space Controller must only sign-off and de-activate the Confined Space Entry Permit when they have visually confirmed that all persons listed as entering the space have exited the space safely.

3.14 Confined Space Emergency

In the event of an emergency, the standby person should:

- Immediately notify of an emergency as specified in the Confined Space Entry Permit.
- Attempt to remove the victim by use of the retrieval line (if attached) from outside the confined space. **NOTE:** The standby person is not to enter the confined space for any reason.
- Give Emergency Services personnel any information they request.

3.15 Consultation

Supervisors must consult with Workers who undertake work in Confined Spaces to identify hazards, assess risks and identify risk control measures.

Where a contractor is engaged to carry out work on a Queensland Hydro workplace that contains Confined Spaces, Queensland Hydro must ensure that the contractor is aware of:

- The Confined Spaces located at the site (access to the Confined Space register); and
- Their responsibilities in relation to this procedure and in relation to undertaking work in Confined Spaces.

Responsibilities

Who	What
Project/Operations Manager	• Provide adequate resources to comply with this procedure; • Ensure a current Confined Space register is maintained for every Queensland Hydro workplace within their area of responsibility; • Implement a systematic process to identify Confined Spaces on Queensland Hydro workplaces within their area of responsibility;

	• Arrange for placarding all confined spaces, including the entry point into all areas that have been designated “Confined Spaces” for workplaces within their area of responsibility • Ensures this Procedure is implemented and complied with by workers and Service Providers; • Communicate, consult, instruct and supervise Workers involved in Confined Space activities; • Ensure all Workers involved in Confined Space activities have current and appropriate levels of training; • Regularly monitor and review the effectiveness of risk controls and implement corrective actions and treatment plans where required.
Duty Manager/Site Supervisor	• Ensures that the conditions of entry are fully complied with during entry and work within the confined space; • Ensures that all Workers who may be required to work in a confined space receive the appropriate training prior to attending the job; • Identifies potential permit activities within the workplace; • Ensures appropriate emergency equipment relevant for the particular circumstances is available when undertaking the task; • Provides appropriate Personal Protective Equipment (PPE) for Workers engaging in confined space work; and • Ensures that contractors supply a safe system of work which relates specifically to the permit activity being performed.
Permit Roles and Responsibilities	For Permit to Work Roles and Responsibilities refer to Permit to Work Procedure.
Workers	• Follow requirements as outlined within this Procedure; and • Participate in the completion of the permit where required.
Standby Person	• Remain in immediate proximity to the confined space whenever anyone is inside the confined space; • Maintain visual observation of the work being undertaken within the confined space wherever practicable. Alternatively, maintain audible or tactile communication with the work team; • Have means of communication to contact emergency response personnel; and • Have an understanding of the Emergency Response plans. **The standby person must NOT enter the confined space under any circumstances.**
Confined space controllers	• Ensure that the Confined Space Entry Permit identifies all relevant controls required for safe entry to the confined space; • Ensure all requirements of the Confined Space Entry Permit are fully implemented prior to anyone entering or working in the confined space; • Ensure that before authorisation is given for the confined space to be returned to service, that the work in the confined space has been completed, and all persons involved in the carrying out of the work have left the confined space.
H&S Team	• Ensure confined space registers are developed, consistent and maintained; • Audit compliance with the requirements of this procedure.

	• Develop and implement a training schedule for Confined Space entry and management in accordance with the requirements of this procedure. • Develop and maintain a Training Needs Analysis (TNA) which includes training requirements for Confined Space entry and management.

Defined Terms

Terms	Definition
Atmospheric monitoring	The continuous monitoring of oxygen levels for any variation and for the presence of atmospheric contaminants (combustible or toxic).
Atmospheric testing	The testing at regular intervals of time, which is not continuous, of oxygen levels and atmospheric contaminants.
Competent person	A person who has acquired, through training, qualification or experience, the knowledge and skills to carry out the task specified or relevant to the subject matter and can provide assessment, advice and analysis of the task using the relevant codes of practice, standards, methods or literature
Confined Space	An enclosed or partially enclosed space that: • is not designed or intended primarily to be occupied by a person; and • is, or is designed or intended to be, at normal atmospheric pressure while any person is in the space; and • is, or is likely to be, a risk to health and safety from: – an atmosphere that does not have a safe oxygen level; – contaminants, including airborne gases, vapours, and dusts, that may cause injury from fire or explosion; – harmful concentrations of any airborne contaminants; or – engulfment **NOTE:** does not include a mine shaft or the workings of a mine.
Confined space entry	Entry to a confined space is considered to have occurred when a person's head or upper body enters the space.
General construction induction training	A particular type of training course defined and regulated by WHS legislation, to be completed by workers performing construction work. (*WHS Regulation 2011* – s 316)
High Risk Construction work	Has the meaning given to that term in the Work Health and Safety Regulations (Qld).
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.

Risk Assessment	Overall process of risk identification, risk analysis and risk evaluation. A process to assess the hazards, the likelihood of risk and the consequences of risk associated with a work activity and to determine the measures to treat or control the risk to the Appropriate Standard.
Shall / Will / Must	Indicates that a statement is mandatory.
Standby Person	A person who has acquired through training and knowledge the skills to enact an appropriate emergency response.

References

Document code	Document title
HS-STD-0002	Confined Space Standard
HS-FRM-0041	Confined Space Determination
HS-PRO-0004	HS Assurance and Improvement Procedure
HS-FRM-0008	Confined Space Entry Permit
HS-PRO-0008	Training and Competency Procedure
HS-PRO-0009	Permit to Work Procedure
HS-PRO-0007	HS Risk Management Procedure
HS-PRO-0026	Incident Management Procedure
HS-PRO-0016	Hot Work Procedure
HS-PRO-0035	Lock Out Tag Out Procedure
	Confined Spaces Code of Practice 2021 (Qld)
	Work Health and Safety Regulation 2011(Qld)
AS 2865	*Confined Spaces*