

**APPENDIX 'C'**  
**STANTEC CONFINED SPACE ENTRY POLICY**

## **1 PURPOSE**

This Safe Work Practice (SWP) identifies the requirements for Stantec employees to safely perform work in and around confined spaces.

As Stantec has operations around the globe, SWPs are designed to complement and support local legislation. Where a conflict is identified between an SWP and legislation in the jurisdiction where Stantec work is being performed, local legislation will prevail if it requires a higher standard. For information on legislative requirements by geography, refer to section 8.0 Resources > External.

## **2 SCOPE**

This SWP applies to all Stantec operations involving entry into confined spaces, both Permit-Required Confined Spaces (PRCS) and Non-Permit-Required Confined Spaces (NPRCS). Client permits may be used where mandated. Where not mandated, the Stantec permit must be utilized.

In cases where Stantec personnel will be entering confined spaces under the control of a client or a contractor, the Client or contractor's Confined Space management arrangements will be applied. The Stantec PM will verify that the client or contractors' arrangements are suitable and confirm the arrangements through the Risk Management Strategy (RMS1).

This SWP covers confined space activities, which may be practiced in combination with other task which have their own hazards and risk e.g., hot work, lock, tag, and try, working at height.

Guidance provided in this SWP is not intended to supersede or replace legislative requirements.

## **3 RESPONSIBILITIES**

### **3.1 Health, Safety, Security, & Environment**

- Maintain this SWP
- Assist with interpretation and methods of compliance with this SWP and local legislative requirements
- Periodic formal and informal audits that verify whether requirements within this practice are being met

### **3.2 BC Leader**

- Require that this SWP be implemented for all applicable operations
- Hold designated employees accountable for properly implementing this SWP

### **3.3 Project Manager**

The Project Manager has the primary responsibility for implementing this practice. This responsibility includes the following:

- Identify the potential hazard exposures for employees and select appropriate hazard controls using the Risk Management Strategy (RMS1), or the site-specific Health and Safety Plan (HASP)
- Review the tasks and procedures with the employees prior to commencing work
- Communicate the hazards and controls to employees

- Assign only employees that are knowledgeable in the requirements of this SWP, who understand the hazards associated with the work, who can apply the appropriate controls, and have training identified in the SWP
- Hold employees accountable for properly implementing this SWP
- Coordinate with the OSEC for the supply and/or purchase of the required personal protective equipment (PPE) and any other equipment or precautions that may be required, and to coordinate related training
- Provide the required PPE to employees and require them to use the PPE identified for their tasks
- Make sure provided equipment is selected, inspected, and maintained in accordance with the manufacturer's recommendations
- Outline the processes for obtaining external medical assistance by communicating the confined space plan and the emergency response and transportation procedures
- Coordinate the scheduled work with the Client or other parties responsible for occupational health and safety programs on site to verify that all Stantec employees performing work on-site are aware of any required precautions

### **3.4 Entry Supervisor**

Where Stantec personnel are planning and controlling the confined space entry, the supervisor will:

- Know the requirements of the PRCS entry SWP including any local requirements, including proper execution of duties of entrants, attendants, and rescue personnel
- Verify that all required actions are taken prior to endorsing the permit and allowing entry to begin including:
  - Preparing and inspecting the area or equipment for entry of the PRCS
  - Notifying the equipment owner and other affected employees that PRCS work is scheduled, and gathering from these individuals the information necessary for safe execution of the work
  - Preparing and processing the Lock, Tag, & Try (LTT) permit, Hot Work permit, and any other permits as required
  - Initiating the testing and documentation to complete the PRCS permit
  - Conducting the pre-entry meeting
  - Review with entrants, attendants, and rescue personnel initial atmospheric monitoring results
  - Acquire the entrant's, the attendant's, and rescue personnel's initials on the permit demonstrating knowledge of permit requirements and limitations
  - Maintaining the safe and acceptable conditions for the duration of the permit
- Notify rescue personnel. Verify that rescue services and equipment are available and the means for summoning them are operable
- Communicate the status and requirements of the entry to other Entry Supervisor(s) whenever the Entry Supervisor is changed
- Suspend/terminate entry and remove personnel and equipment, when stated permit conditions cannot be maintained or upon completion of the work. Endorse the permit and notify appropriate personnel.

### **3.5 Authorized Entrant**

- Know the potential hazards that may be encountered during the entry and proper use and limitations of equipment for control of these hazards. This is achieved by:
  - Reviewing the initial monitoring of the PRCS permit
  - Reviewing the SDS (if applicable) before entering the vessel
  - Be familiar with the operation and maintenance requirements of any equipment
  - Verifying that all rescue equipment is in place
- Follow the permit requirements
- Notify the attendant of any emergency or unacceptable condition in the PRCS that may not allow for the standard procedures to be followed and/or PRCS entry to proceed
- Know how to respond to emergencies including method(s) of self-rescue
- Know symptoms and warning signs of exposure to potential hazards or prohibited conditions
- Exit the PRCS immediately if symptoms, warning signs, or unacceptable conditions occur or if directed by the attendant or entry supervisor
- Sign the permit as the Authorized Entrant

### **3.6 Attendant**

Note: The attendant is prohibited from performing any non-attendant duties during the PRCS entry.

- Be responsible for only one PRCS at a time
- Provide standby assistance to entrants entering the PRCS that may include checking breathing air cylinders, or any ancillary duties that do not require the attendant to enter the PRCS or leave their position
- Know the mode, signs, symptoms, and consequences of exposure
- Log entrants on the permit
- Remain stationed at the point of entry outside the PRCS until relieved
- Remain in constant two-way communication with entrants; this can include signaling, visual contact, and verbal radio communication
- Monitor activities inside and outside the PRCS
- Detect any prohibited conditions or hazards outside the space that could endanger the entrants and direct entrants to exit/evacuate the PRCS when any irregularities are observed
- Initiate evacuation and emergency procedures

### **3.7 Vicinity Person (where required)**

- Be within easy hailing distance of the Attendant
- May be the Vicinity Person for more than one PRCS so long as they can see both PRCS
- May perform other minor duties (e.g., sweeping) provided the Attendant is still able to communicate with them

**4 HAZARDS**

**4.1 Energy Wheel**



The energy wheel is a visual tool used by Stantec to identify 10 sources of energy and to assess and control the hazards associated with each source. The energy wheel supports and enhances our existing Hazard Recognition, Assessment, and Control (HRAC) process. Before beginning any activity, review the potential hazards and controls associated with the task. For project work, these sources, hazards, and controls will be documented on the Risk Management Strategy (RMS1), and in a Field Level Risk Assessment (RMS2/field app). Below are examples of energy sources and hazards commonly associated with working in and around confined spaces.

Energy	Hazard / Condition
Gravity	<ul style="list-style-type: none"> <li>• Enclosed structures becoming filled with free-flowing solids such as grain or cement silos</li> <li>• Falls from changes in height such as weirs, low flow channels, and access/egress arrangements</li> <li>• Objects falling into entry shafts during work activity</li> <li>• Hidden sumps, trip hazards etc. due to poor lighting or covered by detritus</li> </ul>
Mechanical	<ul style="list-style-type: none"> <li>• Failure of isolation arrangements e.g., valves, penstocks while in confined area</li> <li>• Sudden or automatic operation of equipment such as fans or pumps</li> <li>• Poor condition and performance of any existing forced air ventilation arrangements</li> <li>• Contact with unguarded moving equipment within confined space e.g., fans, screens, pumps</li> </ul>
Motion	<ul style="list-style-type: none"> <li>• Surges in flows of water in sewers and drains due to weather or activities of other persons</li> <li>• High risk of slips, trips, falls in sewers and drains</li> <li>• Inflow of water due to tidal conditions</li> </ul>
Noise	<ul style="list-style-type: none"> <li>• Noise at Stantec action levels due to activity and/or existing equipment in confined space areas</li> </ul>
Pressure	<ul style="list-style-type: none"> <li>• Failure/leakage of pressure systems, pipes, or vessels within confined space such as in a service tunnel</li> </ul>
Thermal	<ul style="list-style-type: none"> <li>• Hot work activities where there is potential for explosive atmosphere</li> <li>• Exposure or contact with hot or cold Industrial processes involving heating, steam, boilers, ovens, or refrigerants</li> <li>• Increased physical work in confined areas</li> </ul>
Biological	<ul style="list-style-type: none"> <li>• Working in sewage</li> <li>• Risk of needle stick injuries from disposed of syringes leading to a blood borne virus</li> <li>• Diseases such as leptospirosis (Weil's disease)</li> <li>• Psittacosis where heavy contamination of bird droppings</li> </ul>

Chemical	<ul style="list-style-type: none"> <li>• Reaction of products causing a dangerous atmosphere</li> <li>• Reduction or displacement of oxygen due to rust, methane, hydrogen sulphide, carbon dioxide, and other natural chemicals</li> <li>• Oxygen Enrichment through accidental ventilation with oxygen, or leaks in oxy/acetylene equipment; increases the flammability of materials</li> <li>• High levels of residual chlorine following emptying of water contact tanks</li> <li>• Industrial discharges into sewers</li> <li>• Corrosive gasses depleting strength of structural elements such as steel ladders and walkways</li> <li>• Toxic substances in the form of vapors, liquids or solids that are normally found in the confined space and which cannot be eliminated completely; toxic vapors can enter the body by inhalation, skin absorption, ingestion or even open sores, causing acute toxicity (immediate effects) or chronic toxicity (appearing long after being exposed, or may take a long time to disperse from the body)</li> </ul>
Electrical	<ul style="list-style-type: none"> <li>• Risk of igniting explosive atmosphere</li> <li>• Shock from direct contact or encroaching shock protection approach boundary associated with existing or temporary electrical equipment within the confined area</li> <li>• Generation of static electricity by workwear</li> </ul>
Radiation	<ul style="list-style-type: none"> <li>• Where working on client sites where radioactive materials are used or stored</li> <li>• Introduction of risk through work activity (e.g., material testing)</li> <li>• Naturally occurring radiation from surrounding ground such as radon</li> </ul>

## 5 CONTROLS

Apply the hierarchy of controls when planning for confined space entry. It may be possible to eliminate the need for confined space entry through use of technology such as CCTV, infra-red or drone surveys. If elimination through technology is not possible, consider using these methods to provide condition/survey information before entry. This may focus the team on any additional hazards and define the key areas to survey/inspect, the data collection may reduce the duration or frequency of any subsequent confined space entries.

### 5.1 Identification and Evaluation

- Using the definitions from Section 9 of this SWP and any local legislative requirements, determine if the space identified in the scope of work is a Confined Space. If so, determine if it is a PRCS or a NPRCS.
- If the space is a PRCS, use the flow chart in Appendix A to determine the applicable section of this practice.
- Where reasonably practicable, alternative means to perform work that will not require a worker to enter a hazardous confined space will be employed. If no alternative means is practical, then the entry procedures in the SWP will be followed.
- Each project manager will take all reasonably practicable steps to prevent any unauthorized entry into a confined space.

### 5.2 PRCS ENTRY PROCEDURES

#### 5.2.1 Permit Implementation

Before entry into a PRCS is authorized, an entry permit (see [SWP-411a – PRCS Entry Permit](#)) will be completed and signed by a qualified person to document that the space has been

evaluated and is safe to enter. The contents of the permit will be communicated to the entrants and posted.

### **5.2.2 Duration of Permits**

For a permit to remain in effect, the following must be done before each re-entry into the PRCS:

- Atmospheric tests results will follow requirements of Section 5.2.6 of this SWP.
- Only operations or work originally approved on the permit will be conducted in the PRCS.
- The permit will specify the time period during which entry is authorized. Any entry initiated after or continued beyond the specified time requires the completion of an additional permit. The permit must be re-issued after duration of one shift not to exceed 12 hours.

### **5.2.3 Revoking Permits**

When conditions or work activities are different than those specified on the permit and could introduce a new hazard to the PRCS, then the permit will be immediately revoked.

### **5.2.4 Terminating Permits**

The entry supervisor will terminate the entry and cancel the permit when the entry operations covered by the entry permit have been completed.

Once the required task is complete, all entrants have exited the space, and the space is ready to be returned to normal service, the entry supervisor will debrief personnel involved in the entry and cancel the permit. Any problems identified during the entry will be noted on the permit, so that necessary changes to the entry procedure can be made.

Each canceled entry permit will be retained by a qualified person for a minimum of 1 year to facilitate their annual review of the PRCS program. (If monitoring is conducted that results in any contaminant present over 0 ppm, this information will be recorded on the entry permit, and the data must be maintained for each exposed employee (entrant) for 30 years in accordance with medical exposure record retention requirements. Copies of permits containing monitoring data will be made and placed in the medical files of each affected employee. Then, the original could be destroyed after the annual review.)

### **5.2.5 Changing Work Conditions**

A new permit will be issued, or the original permit re-issued whenever changing work conditions or work activities introduce new hazards to the PRCS. (An example would be the decision to weld within the PRCS after approved work had already begun. Consequently, a hot work permit must be issued with hot work considered as part of the evaluation for precautions on the permit.)

### **5.2.6 Atmospheric Testing**

If toxic air contaminant(s) are present or suspected of being present, the following requirements must be met:

- Before entry into a PRCS, necessary testing will be conducted for hazardous atmospheres by a qualified person.
- A qualified person must identify the proper monitoring device (Dräger tubes, Broad Range Organic Sensor, etc.) to quantify the individual contaminants. Testing equipment used in classified areas will be listed, approved, or certified for use in such areas. This listing, approval, or certification will be from nationally recognized testing laboratories.

- Further testing will be conducted with ventilation systems turned on to verify that the contaminants are removed, and that the ventilation system is not a source of contamination.
  - If the PRCS is vacated for any significant period of time, the atmosphere of the PRCS will be retested before re-entry is permitted. (After work stoppages (such as lunch or breaks) the PRCS and area must be inspected visually, and air monitoring must be conducted to determine whether conditions have changed.)
  - Continuous monitoring of the air in the PRCS must be made during all entries. The attendant must enter current readings every 15 minutes of the entry onto the permit.
  - Testing of the PRCS will be conducted in a manner that represents the atmosphere throughout the PRCS. (Readings will be taken at the top, middle, bottom, and sides of the PRCS by a meter that is designated and calibrated to measure the oxygen, combustible, and toxic levels.)
  - Where personnel must enter the PRCS to complete atmospheric testing, the space will be treated as a PRCS.
  - Only test equipment that has been recently calibrated and shown to be functioning will be used to test spaces. All meters must be calibrated to the manufacturer's specifications.
  - Immediately prior to testing the space for a particular entry, the monitoring equipment will be "zeroed" to current ambient levels.
  - The atmosphere of the PRCS will be considered within acceptable limits whenever the following conditions are maintained:
    - Oxygen – 20% to 22%: Atmospheres with an oxygen content less than 20% or greater than 22% will be considered Immediately Dangerous to Life or Health (IDLH), and entry WILL NOT be permitted without supplied air as provided in section 5.2.11.
    - Flammability: The flammable vapor concentration may not exceed 10% of the Lower Explosive Limit (LEL), properly converted for the calibration gas.
    - Toxic air contaminants: concentrations must be less than the IDLH for the contaminant(s) in question. Levels below the IDLH and above the applicable recognized local occupational exposure limits (OEL), such as OSHA PEL, ACGIH TLV, UK HSE EH40, German MAK, NIOSH REL, AIHA WEEL, or manufacturer-established working limits, will require appropriate respiratory protection as identified in section 5.2.11.
    - Testing will be performed in the following order:
      - Oxygen
      - Flammability
      - Toxicity
- Note: Insufficient oxygen levels will interfere with flammability readings; flammable levels in these situations must be verified.

### **5.2.7 Isolation**

All energy sources, (electrical, chemical, steam, hydraulic, gravity, etc.) that are potentially hazardous to PRCS entrants will be isolated, secured, relieved, disconnected and/or restrained before personnel are permitted to enter the PRCS. The objective is the control of any situation where unexpected energization, start-up or release of stored energy may cause injury to workers.

- Methods and means will be selected and used to prevent flammable, toxic, irritating, or oxygen displacing gases and vapors from entering the space. All hazardous materials, high



pressure, high temperature and other piping that could introduce a hazard will be isolated by utilizing blinding, disconnection, removal, or double block and bleed as needed to prevent entry of material(s) and hazardous contaminant(s):

- All pipelines attached to the PRCS must be line blanked.
- Where blanking is not possible, the pipeline will be disconnected.
- The last alternative is to double block and bleed, including chain locking the nozzle valve in the closed position.
- Exceptions may be made under certain circumstances for pipelines carrying non-hazardous materials such as air, water, etc. A LTT permit must be performed in conjunction with a PRCS permit. A Line Breaking permit will be completed prior to activities that involve opening or disconnecting lines.
- Pipelines or similar conveyances between the PRCS and point(s) of isolation will be drained, cleaned, or flushed of hazardous material and known hazardous contaminants, as necessary. A qualified person will confirm that such piping has been flushed, cleaned, or purged.
- Precautions will be taken to ensure that whenever drains, vents, or piping are left open that reversal flows, or air contamination from adjacent processing, or chemical handling, cannot enter the PRCS.
  - Vents, vapor stacks, etc. exhausting directly to the atmosphere should be disconnected at the discretion of the Equipment Owner. If these vents connect to a manifold system, contain steam jets, or are capable of admitting hazardous fumes, liquids, etc.; they must be treated similar to pipelines and disconnected or blanked to prevent access to vessel/area.
  - Special precautions will be taken when entering double walled, jacketed, or internally insulated PRCS that may discharge hazardous materials through the vessel's internal wall. (Distillation vessels, boilers and similar type equipment may contain cracks or leaks that may produce a hazardous environment inside the PRCS.)

### 5.2.8 Lock, Tag, & Try (LTT)

Equipment will be locked or tagged or both to eliminate the power to all moving parts, such as agitators, drives, dispersion blades, etc. Equipment must be locked out at the disconnect switch. All electrical hazards will be eliminated. A LTT Permit must be completed before entry. Each team member entering the PRCS must attach a lock. Refer to [SWP-408 – Lock, Tag, & Try](#) for specific requirements.

### 5.2.9 Ventilation

When ventilation is used to control atmospheric contaminants in the PRCS, the space will be ventilated until the atmosphere is within acceptable limits. **CAUTION: MAKE SURE THAT VENTILATED AIR FROM THE SPACE DOES NOT GO INTO AN AREA THAT WILL CAUSE AN EMPLOYEE EXPOSURE CONCERN. VENTILATE TO THE OUTSIDE IF POSSIBLE.** Atmospheric testing will be done in accordance with Section 5.2.6.

- Blowers or other means of introducing air into the space will be placed in such a manner to minimize the possibility of introducing air contaminants that may create unacceptable limits.
- Ventilation will be maintained during the entry if there is a potential for the atmospheric condition in the PRCS to become unacceptable.
- Fresh air must be continuously supplied (fans/air horn) into the PRCS in volume sufficient to:

- Remove vapors and fumes that may be generated by the work carried on inside the PRCS, such as welding or cleaning.
- Remove excess heat to reduce fatigue and prevent exhaustion of the team members inside the PRCS.
- Ventilation will be from a clean source and provide a minimum of 10 air changes per hour and a rate of 250 cubic feet per minute.

#### **5.2.10 Cleaning/Decontamination**

The PRCS will be cleaned/decontaminated of hazardous materials as the preferred method of eliminating or reducing exposure. Cleaning/decontaminating will be done to the extent feasible. Residues, scum, etc., in the PRCS must be identified and should be washed, steamed, scraped, neutralized, etc., as deemed necessary to remove hazardous material or atmospheres.

If the client is responsible for cleaning/decontamination, the Stantec PM will seek verification from the Client that the cleaning/decontamination has been completed.

#### **5.2.11 Personal Protective Equipment (PPE)**

A qualified person will determine personal protective equipment needed by all personnel entering the PRCS including rescue teams. A hazard evaluation will be done to determine what PPE should be used. (Also refer to [SWP-105 – Personal Protective Equipment.](#))

- Selection: Employees will wear PPE selected in accordance with the requirements of the job to be performed. PPE will meet the specifications of applicable standards and regulations (e.g., head protection, eye and face protection, hand protection, foot protection, protective clothing, and hearing protection).
- Inspection: PPE will be inspected by the user prior to use.
- Toxicity levels will be evaluated against local legislative requirements. Where no local requirements apply, if the toxicity levels determined during air monitoring are greater than 0 and less than IDLH levels, the following guidelines must be followed to determine acceptable respiratory protection:
  - If toxicity levels are greater than 50% times the assigned protection factor (APF) of the respirator (10 – all qualitatively-fitted air purifying respirators, 50 – quantitatively-fitted full-face air purifying respirators) times the OEL [ $0.5 \times \text{APF} \times \text{OEL}$ ], Grade D supplied air with egress bottle is required.
  - If toxicity levels are greater than 0 ppm, and less than the value obtained in a), the applicable air purifying respirator with appropriate cartridge/filter is required.
  - If toxicity levels are 0 ppm, and changes in this value are not anticipated, no respiratory protection is required.
- Supplied air respiratory systems WILL NOT use plant air. Only Grade D breathing air from external bottles or SCBAs are permitted.

#### **5.2.12 Safeguards and Equipment to be Used**

- Entry and Exit: Safe entry and exit means will be provided for PRCS. Each entry and exit point will be evaluated to determine the most effective methods and equipment to be utilized to enable employees to safely enter and exit the PRCS. Barriers will be utilized as necessary to protect entrants from external hazards such as pedestrians and vehicles.
- A full body harness is required to be used by each entrant with a lifeline attached to the shoulders or above. The lifeline should always be attached to the harness and not allowed

to become entangled with other lines. The other end must be secured to a tripod/mechanical pulley system designated for top entry into PRCs. Steps should be taken to prevent the lines from rubbing on sharp edges or dragging through any residue. This is necessary to permit prompt removal of an individual from the PRCs should they become ill, injured or otherwise incapacitated, without requiring another employee to enter the PRCs.

- If the use of a lifeline will increase the overall risk of entry or would not contribute to the rescue of the entrant, then this requirement may be bypassed when justified by hazard assessment.
- A tripod with pulley system/personal winch or other approved mechanical retrieval system capable of being anchored must be provided and used when warranted, i.e., top entry.
- Ladders or other safe means will be used to enter and exit PRCs. The condition of any fixed access equipment will be evaluated as part of the risk assessment process prior to entry. When inside fixed ladders are not present, a portable ladder or other safe means should be provided when entering from the top. The ladder must be tied at the top. Life lines/harness must be used as a backup means of fall protection during entry from the top (i.e., keep line as snug as practical going up and down); refer to [SWP-201 – Fall Protection/Working from Heights](#) for guidance.

Note: Using a tripod/pulley system to enter a tank is acceptable if the unit is equipped with a dead man winch, and a second person is used to monitor the entry and provide counterbalance. The use of a mechanical/electrical/ pneumatic hoist is not allowed.

### **5.2.13 Fall Protection**

Where a potential exists for persons or objects falling into a PRCs, warning systems or barricades will be employed at the entrance.

- Any condition making it unsafe to remove an entrance cover will be eliminated.
- Where adequate footing is not present, either inside the PRCs or outside of the PRCs opening, proper working scaffolds, platforms, etc., should be provided.
- Personnel who work on top of a tank or space with unprotected sides of greater than 4 feet must be tied off per site or corporate fall protection guidelines.

### **5.2.14 Electrical Equipment**

Electrical equipment used in hazardous locations will meet local legislative requirements. Where no requirements apply, follow the appropriate requirements of Article 500 of the National Electrical Code (NFPA-70), or CSA Z462, Standard on Workplace Electrical Safety.

- Explosion proof and/or intrinsically safe electrical equipment or lighting must be used inside the PRCs where possible. Ground fault circuit interrupter (GFCI) or Residual Current Devices (RCD) outlets or pigtailed located outside the space must be used at all times.
- Adequate lighting must be available or provided for good working visibility. Lighting equipment should be kept out of the PRCs as far as is practical and be explosion proof or intrinsically safe.
- Electrical cords used inside a PRCs should be adequately protected from contact with sharp edges and abrasive surfaces that might cause the cord to become cut or broken. Cords must also meet the electrical requirements of the area. A Ground Fault Interrupter/Residual Current Device must be used.

### **5.2.15 Documentation**

Records must exist that provide proof that all harnesses, tripods; gas monitors, etc., have all been regularly inspected to confirm they are in proper working conditions. Any client provided equipment will have inspection records available upon request. A preventive maintenance program will be conducted annually for all equipment. All equipment will be visually inspected by the user before use.

### **5.3 Preparation for PRCS Entry**

- Gather and review information regarding previous contents of the PRCS. Identify potential contaminants of concern to be quantified.
- Perform air monitoring to determine baseline levels in the space to be entered. If acceptable conditions as defined by Section 5.2.6(j) cannot be maintained, entry into the PRCS will not be permitted.
- When isolation of energy sources and hazardous materials in the PRCS is necessary, Sections 5.2.7 and 5.2.8 for Isolation and LTT will be followed.
- When ventilation of PRCS is required, Section 5.2.9 will be followed.
- Entrances to PRCS will be guarded in accordance with Section 5.2.12.
- A Hot Work permit must be completed before welding or burning in the PRCS. (See [SWP-414 – Hot Work](#).) When gas welding or burning is done the torch should be kept out of the PRCS except when in active use. This will prevent the possibility of an accumulation of unburned gases due to leaking equipment. Employees performing hot work inside the PRCS will wear flame retardant treated clothing.
- Hot Work is not permitted in spaces where combustible vapor concentrations exceed 0% of the LEL.

### **5.4 Entering the PRCS**

- Immediately prior to entry, all participants will undergo a briefing to discuss all potential hazards and necessary safety actions. This is to identify the PRCS to be entered, the purpose of the entry, and duration of entry. Each participant will initial next to their name their understanding of the conditions and hazards present in the space.
- Immediately following the briefing and prior to entry, flammability, toxicity, and oxygen content measurements must be made according to Section 5.2.6 Atmospheric Testing.
- The PRCS entry permit must be completed by a qualified person.
- Entry into spaces without respiratory protection is only acceptable if the space has been cleaned and emptied of all residues, and tests at 0% LEL, 20-22% oxygen, and 0 ppm toxics and the sole purpose for entry is for inspection or other non-invasive work. Entry into PRCS with respiratory protection will be allowed in accordance with Sections 5.2.6 and 5.2.11.
- PRCS entrants must be equipped with a full body harness attached to a lifeline as detailed in Section 5.2.12.
- The attendant must be continuously stationed outside of the PRCS, always within observation distance of the team member inside. If the attendant, due to constraints at the area, cannot directly contact emergency services in the event of an emergency, then the attendant will be in contact with someone who can (for example, a control room operator). Additionally, a portable alarm horn or a portable radio can be utilized to summon additional help as needed.

- An appropriate fire extinguisher will be provided immediately outside the PRCS when welding, burning, or any other sources of ignition are present in the PRCS. Vaporizing liquid type fire extinguishers such as Halon or CO2 must not be used because of their ability to create a hazardous atmosphere.
- Water should be readily available, if required for flushing, inside of the PRCS when corrosive materials are used during repairs and/or cleaning.
- Any air-supplied tools must be removed from the PRCS when not in use.

### **5.5 Non-Entry Rescue**

To facilitate non-entry rescue, retrieval systems or methods will be used whenever an authorized entrant enters a PRCS, unless the retrieval equipment would increase the overall risk of entry or would not contribute to the rescue of the entrant. Retrieval systems will meet the following requirements:

- Each authorize entrant will use a chest or full body harness, with retrieval line attached at the center of the entrant's back near shoulder level, or above the entrant's head. Wristlets may be used in lieu of the chest or full body harness if the employer can demonstrate that the use of a chest or full body harness is infeasible or creates a greater hazard than the use of wristlets.
- The other end of the retrieval line will be attached to a mechanical device or fixed point outside the PRCS in such a manner that rescue can begin as soon as the rescuer becomes aware that rescue is necessary. The rescue plan must consider provision of a mechanical device to retrieve personnel from a vertical type PRCS.
- If an injured entrant is exposed to a substance for which a Safety Data Sheet (SDS) or other similar written information is required to be kept at the worksite, that SDS or written information will be made available to the medical facility treating the exposed entrant.

### **5.6 Entry Rescue**

- Personnel assigned to Entry Rescue Teams must meet the requirements listed in Appendix B of this procedure.
- Unless approved by the SVP HSSE in writing, Stantec employees will not perform vessel-entry rescue.
- When outside groups (fire department, contractor, etc.) provide rescue services, a written agreement signed by both parties must be maintained on file. The outside group must receive familiarization training for the site.
- Prior to entry into spaces with levels above 0% LEL and/or 0 ppm toxicity, the rescue services must be contacted and verified as available to provide those services throughout the entry.

### **5.7 Contractors**

When an outside contractor is contracted to perform work that involves a PRCS entry, Stantec will:

- Inform the contractor that the workplace is in a PRCS, and entry is allowed only through compliance with local legislative requirements.
- Inform the contractor of hazards identified and our experience with the PRCS
- Inform the contractor of any precautions or procedures being implemented to protect employees in or near the PRCS where contractor personnel will be working

- Coordinate entry operations with the contractor when Stantec employees and contractor personnel will be working in or near the PRCS
- Inform the contractor that they must comply with the PRCS requirements per this policy.
- Obtain information regarding PRCS hazards and entry operations from client representative before any work is conducted
- Whenever testing of the atmosphere indicates that levels of oxygen, flammability, or toxicity are not within acceptable limits, entry will be prohibited until appropriate controls are implemented or appropriate PPE is provided. If a hazardous atmosphere is present, the contractor will supply their own equipment and air supply. Only certified SCBA contractor personnel can utilize a supplied air respirator with egress supply or SCBA.
- The contractor will be required to supply Stantec with the following:
  - Training records, including PRCS entry, LTT, respirator, hazard communication, and any other applicable training necessary to enter the PRCS
  - Written assurance that the contractor can perform his or her own PRCS rescue in a timely manner
  - Proof of proper equipment for conducting PRCS entry
  - Copies of applicable OSHA 300 Logs, or equivalent

## **5.8 ALTERNATE ENTRY PROCEDURE**

If specific conditions can be met, a PRCS may be classified as an Alternate Entry Space (AES). Entry into an AES does not require an Attendant or Entry Supervisor, nor retrieval and rescue equipment. However, Confined Space training as indicated in Section 6 is still required.

Note: The Entry Supervisor may act as an entrant during "Alternate Entry Procedure" entries.

- For a space to be classified as an "Alternate Entry" space, the following conditions must exist:
  - The only hazard in the space is the potential for a hazardous atmosphere
  - The potential hazard can be eliminated using continuous forced ventilation, and
  - Monitoring data supports the demonstration that continuous forced air ventilation alone is sufficient to maintain the permit space safe for entry
- The atmosphere within the space will be continuously monitored to make sure that forced air ventilation is preventing the accumulation of a hazardous atmosphere.
- If the potential for atmospheric hazard cannot be eliminated with ventilation, the space must be entered using the PRCS Entry Procedures listed in section 5.2 above.
- The Entry Supervisor will document the basis for determining that all atmospheric hazards in the permit space have been eliminated or controlled through a certification that contains the date, space location, air sampling data, and signature of the Entry Supervisor making the determination. This certification must be made available to all employees involved. [SWP-411b - Alternate Entry Permit](#) will be used for this documentation.
- If an entrance cover must be removed, the opening will be promptly guarded by railing, temporary cover, or other temporary barrier that will prevent an accidental fall through the opening and will protect each employee working in the space from foreign objects entering the space.
- All hazardous sources of energy will be locked and/or tagged out.
- The Entrant will immediately evacuate the confined space if they become aware of a previously unrecognized hazard, or if conditions within the space change that creates a

new hazard. If this occurs, the Alternate Entry Permit will be canceled, and the space must be reevaluated by an Entry Supervisor prior to re-entry.

- When the confined space entry has concluded, the completed Alternate Entry Permit will be filed and kept on file for a minimum of one (1) year.

## **5.9 RE-CLASSIFICATION**

A space classified as a PRCS may be reclassified as a NPRCS under the following procedures.

- If the PRCS poses no actual or potential atmospheric hazards or if all hazards within the space are eliminated without entry into the space and without the use of forced ventilation, the permit space may be reclassified as a NPRCS for as long as the non-atmospheric hazards remain eliminated.
- If it is necessary to enter a PRCS to eliminate a hazard or to test for atmospheric hazards, such entry will be completed under a confined space permit.
- Once the space is reclassified, it may be treated as a NPRCS for the duration of the work being performed. The permit is no longer required as well as an attendant, supervisor, retrieval, and rescue equipment. Air monitoring should be conducted before entering the non-permitted space. Once a job is complete, the space reverts to a PRCS.
- The Entry Supervisor is responsible for documenting the basis for determining that all hazards in the permit space have been eliminated through a certification that contains the date, the location of the space, any air sampling data to support this and the signature of the Entry Supervisor making the determination. [SWP-411c – Pre-Entry Checklist for Non-Permit Confined Spaces](#) will be used for this documentation. The Entry Supervisor will sign on the checklist that the space has been reclassified, as non-permit required. This certification will be made available to all employees involved.

## **6 TRAINING OR QUALIFICATIONS**

### **6.1 General Requirements**

Personnel responsible for supervising, planning, entering, or participating in PRCS entry and/or rescue (Entry Supervisor, Entrant, Attendant, and Rescue Personnel, including contract personnel) will be adequately trained in their functional duties prior to any PRCS entry. Training must be provided in line with local legislative requirements by a qualified professional prior to the assignment of duties, before there is a change in assigned duties, whenever there is a new hazardous condition without prior training, and if inadequacies in the use of these procedures are identified. Training will include:

- An explanation of the general hazards associated with PRCSs including identification of the characteristics of those spaces that make them IDLH (Immediately Dangerous to Life or Health)
- A discussion of specific PRCS hazards associated with the facility, location, or operation
- The reason for, proper use, and limitations of personal protective equipment and other safety equipment required for the PRCS
- An explanation of the permit system and other procedural requirements for conducting a PRCS entry
- How to respond to emergencies
- Duties and responsibilities as a member of the PRCS entry team
- A description of how to recognize probable air contaminant overexposure symptoms to themselves and co-workers, and method(s) for alerting attendants

- Familiarity with terminology related to PRCS as per this SWP and related Stantec policies/practices
- Selection, inspection, use and maintenance of PPE
- Use of written permits to plan and then manage work within a PRCS
- Development of a strategy to manage contractors hired to perform PRCS work

## **6.2 Additional Training for Atmospheric Monitoring Personnel**

Training will include the proper use of atmospheric monitoring instruments that consists of the following: regular operation, field calibration; conversion factors, basic knowledge of the work being performed; the anticipated hazardous contaminants; and any process that could significantly alter the original conditions inside or outside the PRCS.

## **6.3 Additional Training for Attendants**

- Duties, responsibilities, and procedures for both routine and emergency operations
- Hazards that may be encountered by entrants and the signs and symptoms of over exposure
- Procedures for summoning rescue or other emergency services
- The proper use of equipment used for communicating with entry and emergency/rescue personnel
- Procedures for performing non-entry rescues

## **6.4 Additional Training for Emergency Response Personnel**

- The rescue plan and procedures developed for each type of PRCS they are anticipated to encounter
  - Emergency response personnel should simulate actual rescue conditions by conducting practice drills.
  - Rescuers should be timed to determine if response was rapid enough for successful CPR and first-aid techniques.
  - Typical rescue problems should be covered such as egress restrictions, ability to lift without injury, problems with rescue equipment, and fall hazards.
- Use of emergency rescue equipment
- First aid and CPR techniques
- Simulated rescue practices must be conducted at least once every 12 months by means of simulated rescue operations from actual or mock-up permit spaces

## **6.5 Certification Requirements**

Training to certify PRCS Workers must be provided by an internal PRCS trainer designated by a Regional HSSE Manager, or a reputable contracted training service approved by a Regional HSSE Manager.

- An employee can be authorized and certified to serve in the capacity of one or more of these PRCS Worker designations: Entry Supervisor, Attendant, and/or Entrant.
- Certification of an individual as a PRCS Worker is performance based. The candidate for certification must demonstrate knowledge and skills listed above for the given worker designation.



## 6.6 Recertification Requirements

Once a PRCS Worker has been certified, refresher and recertification will be provided in line with local requirements. Where no local requirements are defined, employees will be recertified every two (2) years, in the same manner as the original certification as described above.

## 6.7 Documentation

Documentation of PRCS training will include lesson plans, handouts, written tests with answer keys, and training rosters signed by participants that document satisfactory performance of the activities mandated in the training. The certification of completed training will contain each employee's name, the signatures or initials of the trainers, and the dates of training.

## 7 OUTSIDE AUTHORITIES TO BE CONTACTED

N/A

## 8 RESOURCES

### 8.1 Internal

- [SWP-411a – PRCS Entry Permit](#)
- [SWP-411b – Alternate Entry Permit](#)
- [SWP-411c – Pre-Entry Checklist for Non-Permit Confined Spaces](#)
- [SWP-105 – Personal Protective Equipment \(PPE\)](#)
- [SWP-201 – Fall Protection/Working from Heights](#)
- [SWP-408 – Lock, Tag, & Try](#)
- [SWP-414 – Hot Work](#)
- Critical Risk Controls Flat Sheet – [Confined Spaces](#)
- For the UK, refer to SWP411(UK) as the terminology, training requirements, permits and risk profile for this type of work is different.

### 8.2 External

Regulatory requirements outlined in legislation can be found by geographic location using the following resources. Consult with your HSSE representative if you have questions or concerns:

- [Stantec's Critical Task Inventory](#)
- [Health & Safety Regulatory Requirements Library](#)
- [Environmental Regulations Library](#)

## 9 DEFINITIONS

**Acceptable Entry Conditions** – Conditions required in a permit space to allow entry and to make sure that employees involved with entry can safely enter into and work within the space

**Attendant** – An individual required to be stationed outside one or more permit spaces for the performance of attendant's duties, such as monitoring the authorized entrants

**Authorized Entrant** – An employee authorized by Stantec to enter a permit space

**Blanking or Blinding** – The absolute closure of a pipe, line, or duct by the fastening of a solid plate (e.g., blind) that completely covers the opening and is capable of withstanding the maximum pressure without leakage

**Confined Space** – Specifically defined by local legislation, but includes the following:

- is large enough and so configured that an employee can bodily enter and perform assigned work
- has limited or restricted means of entry or exit (e.g., tanks, vessels, boilers, ducts, pipelines, vaults, manholes, furnaces, degreasers, pits, and trenches), and
- is not designed for continuous employee occupancy
- has the potential for a specified risk to be present due to the space and/or activity including:
  - Loss of consciousness / asphyxiation arising from gas, fumes, vapors, or the lack of oxygen
  - • Loss of consciousness arising from an increase in body temperature
  - • Serious injury arising from a fire or explosion
  - • Drowning from an increase in the level of liquid
  - • Asphyxiation from a free flowing solid or inability to reach a respirable atmosphere due to entrapment in a free flowing solid

**Double Block and Bleed** – The closure of a pipe, line, or duct by closing and locking or tagging two in-line valves and by opening and locking and tagging a drain to vent valve in the line between the two closed valves.

**Emergency** – Any occurrence or event internal or external to a permit space that could endanger entrants.

**Engulfment** – The surrounding and effective capture of a person by a liquid or finely divided solid substance that is flowable and can be aspirated to cause suffocation or can cause death by strangulation, constriction, or crushing

**Entrant** – the person who enters a permit-required confined space to perform an assigned task

**Entry** – Action whereby any part of the entrant's body breaks the plane of an opening into the permit space

**Entry Permit** – The written document that allows and controls the entry into a permit space

**Entry Supervisor** – The Stantec employee who is responsible for determining if:

- acceptable entry conditions are present at a permit space
- the entry permit has been completed for the permit space
- entry activities are authorized
- oversight is being provided for entry, and
- entry has been terminated at job task completion

**Hazardous Atmosphere** – An atmosphere that may expose employees to the risk of death, incapacitation, injury, acute illness, or impairment of ability to self-rescue (e.g., escape unaided) due to one or more of the following conditions:

- Flammable gas, vapors, or mists in excess of 10 percent of its lower explosive limit (LEL)
- Airborne combustible dust at a concentration that meets or exceeds its LEL (Note: This concentration may be approximated as a condition in which the dust obscures vision at a distance of 5 feet or less.)
- Atmospheric oxygen concentration below 20 percent or above 22 percent
- Atmospheric concentration of any substance for which a dose or a permissible exposure limit is defined in local legislative requirements such as is published in North America -

Subpart G, Occupational Health and Environmental Control, or in Subpart Z, Toxic and Hazardous Substances, and which could result in employee exposure in excess of its dose or permissible exposure limit. Air sampling results for air toxics can also be compared with other accepted occupational exposure limits, such as but not limited to, ACGIH TLVs, UK HSE EH40, German MAKs, NIOSH RELs, AIHA WEELs, or manufacturer-established working limits.

- Any other atmospheric condition that is immediately dangerous to life or health

**Hot Work** – Work within a permit-required confined space that produces arcs, sparks, flames, heat, or other sources of ignition

**Hot Work Permit** – Written authorization by representative of Stantec to perform operations (e.g., riveting, welding, cutting, burning, and heating) capable of providing source of ignition

**Immediately Dangerous to Life or Health (IDLH)** – A condition that poses an immediate or delayed threat to life that would cause irreversible adverse health effects or that would interfere with unaided escape from a permit space

**Inerting** – The displacement of the atmosphere in a permit space by a non-combustible gas (e.g., nitrogen) to result in a non-combustible atmosphere. This procedure would provide an IDLH oxygen-deficient environment.

**Isolation** – The process by which the permit space is removed from service and completely protected against the inadvertent release of energy and material into the space by such means as:

- blanking or blinding
- misaligning or removing sections of lines, pipes, or ducts
- a double block and bleed system
- lockout or tagout of all sources of energy. or
- blocking or disconnecting all mechanical linkages

**Line Breaking** – Opening a pipe, line, or duct

**Lockout/Tagout/Try** – The placement of a lock/tag on the energy-isolating device, in accordance with established procedure, indicating that the energy-isolating device will not be operated until removal of the lock/tag accordance with established procedure

**Lower Explosive Limit (LEL)** – The lowest concentration of a gas or vapor in air that in the presence of an ignition source is capable of producing a flash or fire

**Non-Permit-Required Confined Space** – Confined space that does not contain or have the potential to contain any hazard capable of causing death or serious physical harm

**Oxygen Deficiency** – An atmosphere containing less than 20 percent oxygen by volume

**Oxygen Enriched** – An atmosphere containing more than 22 percent oxygen by volume

**Permit-required Confined Space (PRCS) or Permit Space** – A confined space that has one or more of the following characteristics:

- Contains or has a potential to contain a hazardous atmosphere
- Contains a material that has the potential for engulfing an entrant
- Is configured such that an entrant could be trapped or asphyxiated by the space
- Contains any other recognized serious safety or health hazard

**Permit-required Confined Space Program** – A written policy for controlling and, where appropriate, for protecting employees from permit space hazards and regulating permit space entry

**Permit System** – This written procedure for preparing and issuing permits for entry and for returning the permit space to service following termination of entry

**Prohibited Condition** – Any condition in a permit space that is not allowed by the permit during the period when entry is authorized

**Qualified Person** – A person trained in the proper use of air monitoring equipment and in the anticipation of, recognition and evaluation, and control of employee exposure to hazardous substances and other hazardous conditions in a confined space. This person will be the attendant (e.g., Site Safety Officer or Designate) assigned by the Site Supervisor or Project Manager.

**Project Team Member** – An employee, including senior staff, with technical support responsibilities for a project

**Rescue Service** – Personnel designated to rescue employees from permit spaces

**Retrieval System** – Equipment (e.g., retrieval line, chest or full-body harness, wristlets, mechanical lifting device) used for non-entry rescue purposes only

**Testing** – The process of identifying and evaluating hazards confronted by entrants of permit spaces for the determination whether entry conditions are acceptable

**Vicinity Person** - An employee who is trained in the emergency procedures, who is fully informed of the hazards in the confined space, and who is in the immediate vicinity of the confined space to assist in the event of an accident or other emergency

## 10 DOCUMENTATION SUMMARY

File these records in the Office Safety File:

- Employee Training records and Certifications
- Lesson plans, handouts, etc. as identified in Section 6.7

File these records in the Project Health & Safety File:

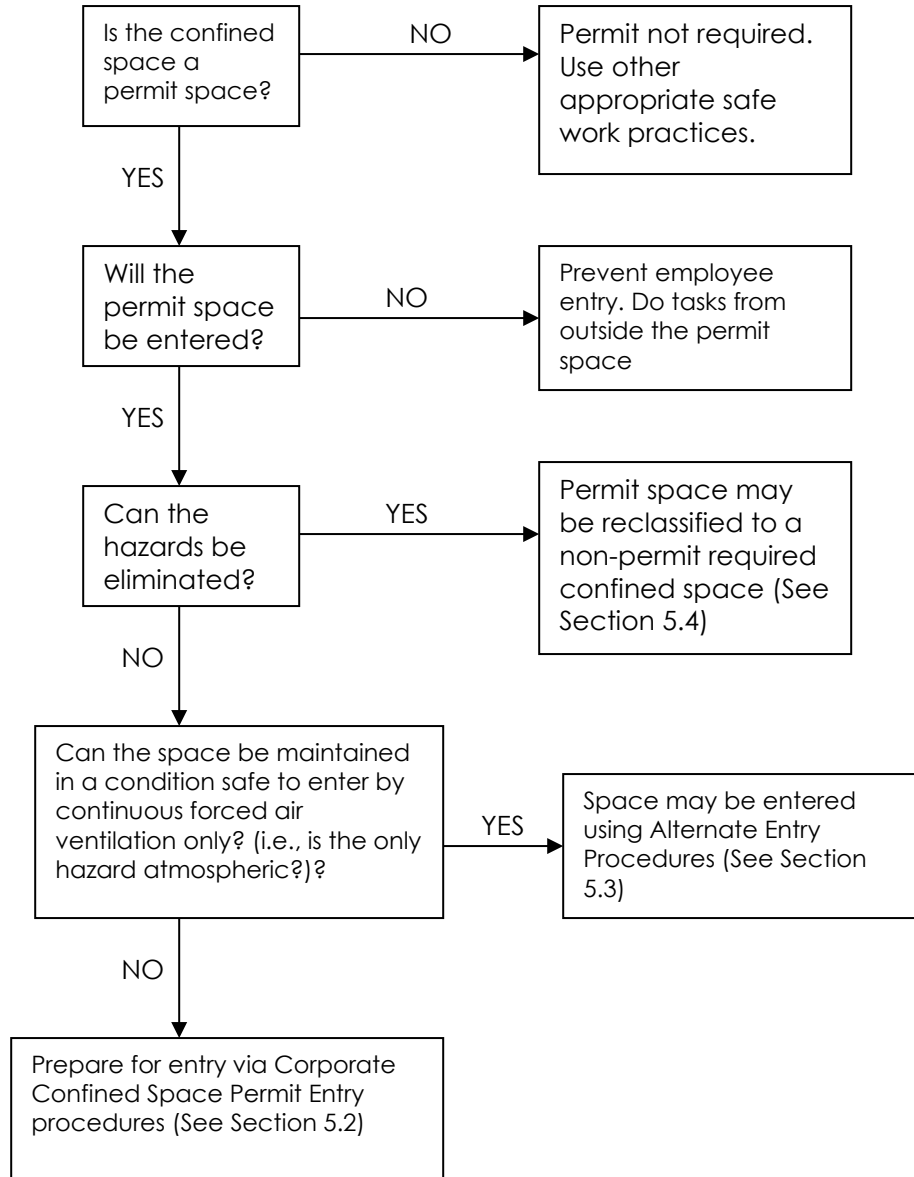
- SWP-411a – PRCS Entry Permit
- SWP-411b – Alternate Entry Permit
- SWP-411c – Pre-Entry Checklist for Non-Permit Confined Spaces
- Any other applicable inspection forms, checklists, training records, or other documentation referenced in this SWP
- HSSE Event Report (RMS3) related to the project

**11 REVISION HISTORY**

Date	Changes	Acknowledgments	Approval
November 15, 2022	Revision to scope to include spaces under control of client or contractor. Adjustments throughout to reflect worldwide application. Edits to 1. Purpose, 3.2 Responsibilities, and 8.2 External Resources to reflect connections to worldwide legislation, Critical Task Inventory, and Regulatory Requirements listings.	C. Hyde, N. Gilbert	P. Poelzer
October 12, 2021	Updates to links and references for migration from StanNet to The Lens; minor corrections and changes to formatting.	K. Bayer	C. Ferguson-Scott
November 8, 2016	Reformat and correction of section references and re-addition of appendices.	C. Ferguson-Scott	J. Lessard
February 23, 2010	Terminology update and reformat.	G. Doran	K. Robinson
January 4, 2010	Initial posting to StanNet.		K. Robinson

APPENDIX A:

PERMIT REQUIRED CONFINED SPACE ENTRY FLOW CHART



## **APPENDIX B:**

### **Rescue Team or Rescue Service Evaluation Criteria**

This appendix provides guidance for selecting an appropriate rescue service. It contains criteria that may be used to evaluate the capabilities of prospective and current rescue teams. For all rescue teams or services, the evaluation will consist of two components: an initial evaluation, in which Stantec decides whether a potential rescue service or team is adequately trained and equipped to perform permit space rescues of the kind needed at the facility and whether such rescuers can respond in a timely manner. It will also include a performance evaluation, in which Stantec measures the performance of the team or service during an actual or practice rescue.

#### **INITIAL EVALUATION**

The facility should meet with the prospective rescue service to facilitate the evaluations required by this program. At a minimum, if an off-site rescue service is being considered, the facility must contact the service to plan and coordinate the evaluations required by the program. Merely posting the service's number or planning to rely on the emergency services phone number to obtain response at the time of a permit space emergency would not comply with the standard.

The capabilities required of a rescue service vary with the type of permit spaces from which rescue may be necessary and the hazards likely to be encountered in those spaces. Answering the questions below will assist facilities in determining whether the rescue service is capable of performing rescues in the permit spaces present at the workplace.

- What are the needs of the employer with regard to response time (time for the rescue service to receive notification, arrive at the scene, and set up and be ready for entry)? For example, if entry is to be made into an IDLH atmosphere, or into a space that can quickly develop an IDLH atmosphere (if ventilation fails or for other reasons), the rescue team or service would need to be standing by at the permit space. On the other hand, if the danger to entrants is restricted to mechanical hazards that would cause injuries (e.g., broken bones, abrasions) a response time of 10 or 15 minutes might be adequate.
- How quickly can the rescue team or service get from its location to the permit spaces from which rescue may be necessary? Relevant factors to consider would include: the location of the rescue team or service relative to the employer's workplace, the quality of roads and highways to be traveled, potential bottlenecks or traffic congestion that might be encountered in transit, the reliability of the rescuer's vehicles, and the training and skill of its drivers.
- What is the availability of the rescue service? Is it unavailable at certain times of the day or in certain situations? What is the likelihood that key personnel of the rescue service might be unavailable at times? If the rescue service becomes unavailable while an entry is underway, does it have the capability of notifying the employer so that the employer can instruct the attendant to abort the entry immediately?
- Does the rescue service meet the local legislative requirements?? If not, has it developed a plan that will enable it to meet those requirements in the future? If so, how soon can the plan be implemented?
- For off-site services, is the service willing to perform rescues at the workplace? (A facility may not rely on a rescuer who declines, for whatever reason, to provide rescue services.)

- Is an adequate method for communications between the attendant, facility, and prospective rescuer available so that a rescue request can be transmitted to the rescuer without delay? How soon after notification can a prospective rescuer dispatch a rescue team to the entry site?
- For rescues into spaces that may pose significant atmospheric hazards and from which rescue entry, patient packaging and retrieval cannot be safely accomplished in a relatively short time (15-20 minutes), facilities should consider using airline respirators (with escape bottles) for the rescuers and to supply rescue air to the patient. If the facility decides to use SCBA, does the prospective rescue service have an ample supply of replacement cylinders and procedures for rescuers to enter and exit (or be retrieved) well within the SCBA's air supply limits?
- If the space has a vertical entry over 5 feet in depth, can the prospective rescue service properly perform entry rescues? Does the service have the technical knowledge and equipment to perform rope work or elevated rescue, if needed?
- Does the rescue service have the necessary skills in medical evaluation, patient packaging, and emergency response?
- Does the rescue service have the necessary equipment to perform rescues, or must the equipment be provided by the facility or another source?

## **PERFORMANCE EVALUATION**

In North America, rescue services are required by the OSHA Permit Required Confined Space Entry standard to practice rescues at least once every 12 months, provided that the team or service has not successfully performed a permit space rescue within that time. Refer to local legislative requirements through the Regional HSSSE Manager. As part of each practice session, the service should perform a critique of the practice rescue, or have another qualified party perform the critique, so that deficiencies in procedures, equipment, training, or number of personnel can be identified and corrected. The results of the critique, and the corrections made to respond to the deficiencies identified, should be given to the facility to enable it to determine whether the rescue service can quickly be upgraded to meet the employer's rescue needs or whether another service must be selected. The following questions will assist facilities and rescue teams and services evaluate their performance.

- Have all members of the service been trained as permit space entrants, at a minimum, including training in the potential hazards of all permit spaces, or of representative permit spaces, from which rescue may be needed? Can team members recognize the signs, symptoms, and consequences of exposure to any hazardous atmospheres that may be present in those permit spaces?
- Is every team member provided with, and properly trained in, the use and need for PPE, such as SCBA or fall arrest equipment, which may be required to perform permit space rescues in the facility? Is every team member properly trained to perform his or her functions and make rescues, and to use any rescue equipment, such as ropes and backboards, that may be needed in a rescue attempt?
- Are team members trained in the first aid and medical skills needed to treat victims overcome or injured by the types of hazards that may be encountered in the permit spaces at the facility?
- Do all team members perform their functions safely and efficiently? Do rescue service personnel focus on their own safety before considering the safety of the victim?
- If necessary, can the rescue service properly test the atmosphere to determine if it is IDLH?
- Can the rescue personnel identify information pertinent to the rescue from entry permits, hot work permits, and SDS?



- Has the rescue service been informed of any hazards to personnel that may arise from outside the space, such as those that may be caused by future work near the space?
- If necessary, can the rescue service properly package and retrieve victims from a permit space that has a limited size opening (less than 24 inches (60.9 cm) in diameter), limited internal space, or internal obstacles or hazards?
- If necessary, can the rescue service safely perform an elevated (high angle) rescue?
- Does the rescue service have a plan for each of the kinds of permit space rescue operations at the facility? Is the plan adequate for all types of rescue operations that may be needed at the facility? Teams may practice in representative spaces, or in spaces that are "worst-case" or most restrictive with respect to internal configuration, elevation, and portal size. The following characteristics of a practice space should be considered when deciding whether a space is truly representative of an actual permit space:
  - Internal configuration
    - Open – there are no obstacles, barriers, or obstructions within the space. One example is a water tank.
    - Obstructed – the permit space contains some type of obstruction that a rescuer would need to maneuver around. An example would be a baffle or mixing blade. Large equipment, such as a ladder or scaffold, brought into a space for work purposes would be considered an obstruction if the positioning or size of the equipment would make rescue more difficult.
  - Elevation
    - Elevated – a permit space where the entrance portal or opening is above grade by 4 feet or more. This type of space usually requires knowledge of high angle rescue procedures because of the difficulty in packaging and transporting a patient to the ground from the portal.
    - Non-elevated – a permit space with the entrance portal located less than 4 feet above grade. This type of space will allow the rescue team to transport an injured employee normally.
  - Portal size
    - Restricted – A portal of 24 inches or less in the least dimension. Portals of this size are too small to allow a rescuer to simply enter the space while using SCBA. The portal size is also too small to allow normal spinal immobilization of an injured employee.
    - Unrestricted – A portal of greater than 24 inches in the least dimension. These portals allow relatively free movement into and out of the permit space.
  - Space access
    - Horizontal – The portal is located on the side of the permit space. Use of retrieval lines could be difficult.
    - Vertical – The portal is located on the top of the permit space, so that rescuers must climb down, or the bottom of the permit space, so that rescuers must climb up to enter the space. Vertical portals may require knowledge of rope techniques, or special patient packaging to safely retrieve a downed entrant.



**PRCS ENTRY PERMIT**

POST PERMIT AT JOB SITE UNTIL JOB IS COMPLETED

<b>Location/Description of Confined Space:</b>	
<b>Purpose of entry:</b>	
<b>Project Manager:</b>	<b>Date of Entry:</b>
<b>Rescue Services Provided by:</b>	<b>Time of Entry:</b>
<b>Rescue Services Phone Number:</b>	<b>Expiration Date and Time:</b>
<b>Entry supervisor:</b>	<b>Attendant:</b>
<b>Entrants(s):</b>	<b>FA/CPR Certified Person(s):</b>
PARTICIPANTS WILL INITIAL NEXT TO THEIR NAME ABOVE TO INDICATE THEIR UNDERSTANDING OF THE CONDITIONS AND HAZARDS PRESENT IN THE SPACE.	

<b>Communication Procedures:</b>
----------------------------------

Hazards	Yes	No	Hazards	Yes	No
Oxygen Deficiency	<input type="checkbox"/>	<input type="checkbox"/>	Skin (chemical hazards)	<input type="checkbox"/>	<input type="checkbox"/>
Combustible Gas/Vapor	<input type="checkbox"/>	<input type="checkbox"/>	Electrical Hazard	<input type="checkbox"/>	<input type="checkbox"/>
Combustible Dust	<input type="checkbox"/>	<input type="checkbox"/>	Mechanical Hazard	<input type="checkbox"/>	<input type="checkbox"/>
Carbon Monoxide	<input type="checkbox"/>	<input type="checkbox"/>	Engulfment Hazard	<input type="checkbox"/>	<input type="checkbox"/>
Hydrogen Sulfide	<input type="checkbox"/>	<input type="checkbox"/>	Entrapment Hazard	<input type="checkbox"/>	<input type="checkbox"/>
Toxic Gas/Vapor	<input type="checkbox"/>	<input type="checkbox"/>	Thermal Hazard	<input type="checkbox"/>	<input type="checkbox"/>
Toxic Fumes	<input type="checkbox"/>	<input type="checkbox"/>	Slip/Trip/Fall Hazard	<input type="checkbox"/>	<input type="checkbox"/>
Other:	<input type="checkbox"/>	<input type="checkbox"/>	Other:	<input type="checkbox"/>	<input type="checkbox"/>

<b>Hazards Identified (specify any toxic gases, vapors, or fumes):</b>
--

**HEALTH, SAFETY, SECURITY, AND ENVIRONMENT  
 PERMIT-REQUIRED CONFINED SPACE (PRCS) ENTRY PERMIT  
 SWP-411A**



Special Precautions	Personal Protective Equipment (PPE)
<i>(Check and explain where required)</i>	
<input type="checkbox"/> Lock/tag	<input type="checkbox"/> SCBA
<input type="checkbox"/> Lines blocked or broken	<input type="checkbox"/> Coveralls
<input type="checkbox"/> Fire Protection provided	<input type="checkbox"/> Face/eye protection
<input type="checkbox"/> Ventilation	<input type="checkbox"/> Footwear
<input type="checkbox"/> Area security/Warning signs posted	<input type="checkbox"/> Gloves
<input type="checkbox"/> Escape harness	<input type="checkbox"/> Respirator (Specify)
<input type="checkbox"/> Lifeline	<input type="checkbox"/> Supplied Air
<input type="checkbox"/> Tripod/hoist	<input type="checkbox"/> Air Purifying/ Cartridge Type:
<input type="checkbox"/> Electrical equipment/GFCI approved for atmosphere	<input type="checkbox"/> Head protection
<input type="checkbox"/> Non-sparking tools/Ignition sources removed	<input type="checkbox"/> Hearing Protection
<input type="checkbox"/> Grounding/bonding provided	<input type="checkbox"/> Other (specify)
<input type="checkbox"/> Additional permit(s) required (e.g., hot work)	
<input type="checkbox"/> Other (specify)	
Notes:	Notes:

**AIR-MONITORING DEVICE INFORMATION**

Device	Serial Number/ Device ID	Date of Last Calibration	Field Calibration Performed by	Notes

**AIR MONITORING DATA**

*Attendant air sampling required continuously, with results recorded below every 15 minutes*

Date	Time	% O <sub>2</sub> (>20%, <22%)	Combustible Gas - % LEL (<10%)	CO (<25 ppm)	H <sub>2</sub> S	Other: _____	Sampling Performed by:

Attach an additional sheet to record monitoring results for entries greater than 1 hour in duration.

**Permit Authorization (must be signed before entry):**

This signature certifies that all precautions and equipment are in place and all atmospheric testing shows air acceptable for entry.

Entry Supervisor's

Signature: \_\_\_\_\_ Date: \_\_\_\_\_ Time: \_\_\_\_\_

**Permit Cancellation (must be signed after work is completed):**

This signature verifies that the space has been returned to operating condition.

Entry Supervisor's

Signature: \_\_\_\_\_ Date: \_\_\_\_\_ Time: \_\_\_\_\_

**PERMIT SPACE PRE-ENTRY CHECKLIST**

RESPONSES		QUESTIONS
<b>YES</b>	<b>NO/NA</b>	<b><u>TESTING</u></b>
<input type="checkbox"/>	<input type="checkbox"/>	Were the instruments used in atmospheric testing properly calibrated before and after testing?
<input type="checkbox"/>	<input type="checkbox"/>	Was the Permit Space Calibration form filled out completely and attached?
<input type="checkbox"/>	<input type="checkbox"/>	Is the attendant a qualified person for using the atmosphere testing equipment?
<input type="checkbox"/>	<input type="checkbox"/>	Was the atmosphere in the confined space tested prior to entry? (If no, then go to the Monitoring questions.)
<input type="checkbox"/>	<input type="checkbox"/>	Was oxygen greater than 20% and less than 22%?
<input type="checkbox"/>	<input type="checkbox"/>	Were flammable/combustible gasses present?
<input type="checkbox"/>	<input type="checkbox"/>	- Hydrogen sulfide
<input type="checkbox"/>	<input type="checkbox"/>	- Carbon monoxide
<input type="checkbox"/>	<input type="checkbox"/>	- Methane
<input type="checkbox"/>	<input type="checkbox"/>	- Carbon dioxide
<input type="checkbox"/>	<input type="checkbox"/>	- Other (list) _____
<input type="checkbox"/>	<input type="checkbox"/>	Was the permit space monitoring results form filled out completely and attached?
<b>YES</b>	<b>NO/NA</b>	<b><u>MONITORING</u></b>
<input type="checkbox"/>	<input type="checkbox"/>	Will the atmosphere in the space be monitored while entry tasks are performed?
<input type="checkbox"/>	<input type="checkbox"/>	Will the atmosphere be continuously monitored?
<input type="checkbox"/>	<input type="checkbox"/>	Will the atmosphere be periodically monitored? (if yes, give interval: _____ per hour)
<b>Remember – Atmospheric changes occur due to the work task, or the materials formerly stored in the permit space. The atmosphere may be initially acceptable for entry but can change quickly.</b>		
<b>YES</b>	<b>NO/NA</b>	<b><u>CLEANING</u></b>
<input type="checkbox"/>	<input type="checkbox"/>	Will the space be cleaned before entry is made?
<input type="checkbox"/>	<input type="checkbox"/>	If steam cleaning is used, will the space be allowed to cool before entry?
<input type="checkbox"/>	<input type="checkbox"/>	Did the tank store materials, which may have permeated the lining (e.g., propane)?
<input type="checkbox"/>	<input type="checkbox"/>	Did the tank contain materials that are irritants, corrosive, or readily absorbed through intact skin?
<input type="checkbox"/>	<input type="checkbox"/>	If yes, is the response to the prior question, was verification made that such materials have been completely removed?

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RESPONSES		QUESTIONS
<b>YES</b>	<b>NO/NA</b>	<b><u>VENTILATING</u></b> Will the space be ventilated before entry by supplying air into the space, not exhausting it out? Will ventilation be continued during entry? Is the air intake for the ventilation system located in an area that is free of combustible dusts, flammable gases and vapors, and toxic substances?
<b>YES</b>	<b>NO/NA</b>	<b><u>ISOLATING</u></b> Will the space be isolated from other systems? Will the electrical equipment be locked out? Will disconnects be used where possible? Will the mechanical equipment be blocked, checked, and disengaged where necessary? Will lines under pressure be blanked and bled?
<b>YES</b>	<b>NO/NA</b>	<b><u>CLOTHING / EQUIPMENT</u></b> Will special clothing be required (e.g., chemical resistant boots, chemical suits, chemical splash goggles, fire resistant, etc.)? (If yes, specify: _____) Will special equipment be required (e.g., rescue devices, communications systems, etc.)? (if yes, specify: _____)
<b>YES</b>	<b>NO/NA</b>	<b><u>RESPIRATORY PROTECTION</u></b> Are approved respirators of the type required available at the job location? Will respiratory protection be required (e.g., air-purifying, supplied air, self-contained breathing apparatus)? (if yes, specify: _____) If supplied air respirators are required, does the rescue service have similar respiratory protection?
<b>YES</b>	<b>NO/NA</b>	<b><u>TRAINING</u></b> Are field personnel trained in proper use of the required type of respirator? Is at least one rescue person trained in First Aid/CPR? Are affected personnel trained in permit space entry and hazard recognition?
<b>YES</b>	<b>NO/NA</b>	<b><u>RESCUE</u></b> Will there be an attendant or attendants on the outside in constant visual or auditory communication with the entrant? Will the attendant be able to see and/or hear the person inside at all times? Has the attendant been instructed in non-entry rescue? Is a rescue service available for quick response in the event of an emergency?

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Person Completing Checklist:	_____	Date: _____
Approved by Entry Supervisor:	_____	Date: _____
Project Manager Review:	_____	Date: _____

(COPY TO PROJECT FILE)