VOLUNTEER STATE COMMUNITY COLLEGE

Confined Space Program

Occupational Safety & Health Standards for General Industry - 29 CFR 1910.146

mboyd

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Volunteer State Community College
Confined space Program

Purpose

This program details the process and requirements used for safe entry into a "permit-required confined space."

Scope

This Confined space program applies to all work involving confined space at Volunteer State Community College campuses.

Definitions

Acceptable entry conditions - The conditions that must exist in a permit space to allow entry and assure safe entry and work conditions in the space.

Action Level - The concentration of a monitored chemical/parameter that requires a corresponding action. For example, if a monitored chemical exceeds the respirator protection factor, personnel must evacuate the confined space.

Attendant - An individual stationed outside one or more permit spaces who monitors the authorized entrants and who performs all attendant's duties assigned in the permit required space program.

Authorized entrant - An employee who is authorized by the employer to enter a permit space.

Blanking or blinding - The absolute closure of a pipe, line, or duct by the fastening of a solid plate that completely covers the bore and is capable of withstanding the maximum pressure of the pipe, line, or duct with no leakage beyond the plate.

Confined space - A confined space is an area that is large enough and so configured that an employee can enter to perform work assignments, has restricted means for entry or exit, and is not designed for continuous employee occupancy. There are two types of confined spaces: Permit-required confined space and non-permit required confined space.

NOTE: Any open pit or trench in excess of four feet deep will be considered a permit-required confined space until tested and found to be free of atmospheric hazards and engulfment hazards.

Confined space - Examples include:

boilers
ditches and trenches in excess of 4 feet deep
enclosed drainage ditch entry points
elevator shafts
manholes
process equipment
sewers
storage tanks
ventilation ductwork

Confined space Inventory - An inventory of the permanent confined space including confined space identification number, location, and available hazard information. Additional information may also be added such as control points.

Compressed Air - a compressed gas used for such work as gas welding. For the purposes of confined space entry, compressed air does not include breathing air contained in an airline, escape bottle, or Self-Contained Breathing Apparatus (SCBA).

Double block and bleed - The closure of a line, duct, or pipe by closing and locking two in-line valves and by opening and locking or tagging a drain or vent valve in the line between the two closed valves.

Emergency - Any occurrence (including any failure of hazard control or monitoring equipment) or event internal or external to the permit space that could endanger entrants.

Engulfment - The surrounding and effective capture of a person by a liquid or flowable solid substance that can be aspirated to cause death by filling or plugging the respiratory system or that can exert enough force on the body to cause death by strangulation, constriction, or crushing.

Entry - The action by which a person passes through an opening into a permit-required confined space.

Note: Entry is considered to have occurred as soon as any part of the entrant's body breaks the plane of an opening into the space.

Entry permit - The written or printed document that is provided by the employer to allow and control entry into a permit space and that contains pre-specified information as required by the OSHA standard.

Hazardous atmosphere - An atmosphere that may expose employees to the risk of death, incapacitation, impairment of ability to self-rescue, injury, or acute illness.

Hot work permit - The employer's written authorization to perform operations (for example, riveting, welding, cutting, burning, and heating) capable of providing a source of ignition.

Immediate danger to life or health (IDLH) - Any condition that poses an immediate or delayed threat to life or that would cause irreversible adverse health effects or that would interfere with an individual's ability to escape unaided from a permit space. Examples of IDLH conditions: Unknown atmosphere, oxygen deficient atmosphere (< 19.5% O_2), oxygen enriched atmosphere (> 23.5% O_2), atmospheres with > 10% LEL, or chemicals at concentrations > IDLH concentration determined by NIOSH.

Inerting - The displacement of the atmosphere in a permit space by a noncombustible gas (such as nitrogen) to such an extent that the resulting atmosphere is noncombustible. Inerting produces an IDLH oxygen-deficient atmosphere.

Isolation - The process by which a permit space is removed from service and completely protected against the 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 - The intentional opening of a pipe, line, or duct that is or has been carrying flammable, corrosive, or toxic material, an inert gas, or any fluid at a volume, pressure, or temperature capable of causing injury.

Oxygen deficient atmosphere - An atmosphere containing less than 19.5 percent oxygen by volume.

Oxygen enriched atmosphere - An atmosphere containing more than 23.5 percent oxygen by volume.

Non-permit confined space – A confined space that does not contain or, with respect to atmospheric hazards, have the potential to contain any hazard capable of causing death or serious physical harm.

Permit-required confined space - A confined space that has or the potential exists for hazardous atmospheric conditions (toxic, flammable, asphyxiating), engulfment, inwardly converging walls or floors configuration, or any other recognized serious hazard. Examples of these spaces include (but are not limited to) tanks, process vessels, sumps, sewers, pits, boilers, and ventilation systems. In some instances, trenches, dikes, and ditches over four feet deep will also be considered confined space.

Permit-required confined space program - (permit space program) The overall program for controlling and, where appropriate, for protecting employees from permit space hazards and for regulating employee entry into permit spaces.

Permit system - Written program 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.

Real time instrument - An instrument that measures a chemical concentration and which can be read shortly after the measurement. Examples of real time instruments are the MSA Orion Multi-Gas Detector or colorimetric tubes.

Rescue service - The personnel designated to rescue employees from permit spaces.

Retrieval system - The equipment (including a retrieval line, chest or full-body harness, wristlets, if appropriate, and a lifting device or anchor) used for non-entry rescue of persons from permit spaces.

Testing - The process by which the hazards that may confront entrants of a permit space are identified and evaluated.

Responsibilities

Attendant – The Attendant is responsible for remaining outside of the permit space, maintaining communication with confined space entrants, monitoring the entrants for signs and symptoms of exposure, restricting access to unauthorized personnel, and requiring personnel to evacuate the confined space if hazardous conditions occur or the attendant cannot perform his duties.

Entry Supervisor (ES) – He/She has the overall responsibility for the safety of the entry team and completing any permits required to perform the entry and associated work. The ES contacts the Director of Environmental, Health & Safety providing them with relevant information such as confined space location, purpose of entry, and tools/equipment to be used in the space. The ES is trained for the duties as Entry Supervisor, assembles a qualified confined space team and ensures that all controls listed on the entry permit are in place and that the monitoring results are within the acceptable concentrations, before authorizing initial entry. He or She ensures that the pre-entry briefing is performed and includes signs and symptoms of exposure. He/She prohibits entry into areas with potential confined space hazards until after the space is evaluated and identified hazards controlled. He/She reviews the entry requirements and verifies that all potentially hazard conditions are being controlled.

Entrant – The entrant does not enter unless trained in confined space entry. He/She performs the entry in accordance with the Confined Space Entry Permit (CSEP) e.g. remains in communication with the attendant, knows the confined space hazards, knows the symptoms of exposure, evacuates the confined space if exposure symptoms or additional hazards are detected, and notifies the attendant if exposure symptoms occur or additional hazards are detected. Wears required monitoring instruments and evacuates the confined space if the instrument alarms.

Director of Environmental, Health & Safety- He/She identifies confined spaces and maintains the inventory list. He/She ensures that each permanent confined space is posted. Develops and maintains the written Confined Space Program. She identifies the hazards and testing requirements on the Confined Space Entry Permit and provides Annual Confined Space Training. Performs annual review of confined space permits.

Procedure

All permit-required confined spaces listed on the inventory will be identified by signs indicating: DANGER - PERMIT-REQUIRED confined space - DO NOT ENTER. The sign colors will be red, black, and white as specified by 29 CFR 1910.145(d)(2). No employee will enter a permit-required confined space without proper notification to EH&S and preparation of the required permit and specified pre-entry testing.

Confined Space Entry Requirements

1. Before entry into an area known or suspected to be a Permit required confined space the Entry Supervisor shall contact the Director of Environmental, Health & Safety and then complete the Confined space Entry Permit ***(Attachment A)***.

2. The Director of Environmental Health & Safety will help the Entry Supervisor by identifying hazards associated with entry. The Director of Environmental Health & Safety will consider the historical confined space hazards, equipment and activity hazards, and control measures to determine testing requirements, testing frequency and maximum airborne concentrations for entry. Continuous monitoring will be required for sewer entries and other areas where confined space isolation cannot be achieved and there is a potential source of airborne contaminants.

3. The CSEP will be valid for one shift or as specified on the permit.

4. The Entry Supervisor will perform initial testing to determine if the confined space atmosphere meets the entry criteria.

5. The Entry Supervisor verifies that all required controls are in place and initials the corresponding boxes.

6. If the entry lasts for more than one shift, the Entry Supervisor for the next shift will ensure that the atmosphere is re-tested and the hazards controlled before allowing his team to enter the confined space. **Exception: If the confined space has been reclassified as a non-permit required confined space.**

7. Using the permit information, the Entry Supervisor informs the entrants and attendant of the potential hazards, requirements for entry, communications method, exposure symptoms (if any), rescue programs, and other relevant information.

8. The entrants and attendant sign the permit. The ES ensures that the permit is posted at the work site while the confined space entry is being performed.

9. If the hazards of the space or the work to be performed are changed, or if any prohibited condition exists, the entry will be terminated and the Director of Environmental Health & Safety notified.

10. While working in a permit-required confined space, all workers should be observed closely by the entry supervisor and/or attendants for signs of difficulty. If the worker exhibits any unusual behavior, exposure signs/symptoms, or physical difficulty, the supervisor or attendant will require the employee to exit the area immediately. This will terminate the permit until additional testing and evaluation is performed.

11. After the entry is completed, the authorized supervisor shall fill in the termination time and date, sign the permit, and return it to the Director of Environmental Health & Safety.

12. The Director of Environmental Health & Safety retains the permits for annual review.

<u>Confined Space Entry Permit (CSEP)</u>

The Confined space Entry Permit ***(Attachment A)*** includes the following:

- The permit space to be entered (description/location) and the purpose of the entry. The date and authorized duration of the entry permit.

- The names of the authorized entrant(s), the authorized attendant(s), the authorized entry supervisor responsible for the space. The confined space hazards and associated control measures.
- The acceptable entry conditions and the results of initial and periodic atmospheric testing, including the names or initials of the tester and the time tested.
- The rescue and emergency services to be summoned and how to contact them.
- The communication programs to be used by authorized entrants and attendants (including visual contact, voice contact, radio contact, motion detector, or other means).
- The equipment required for entry, along with any other necessary information and any other permits issued in conjunction with the confined space permit, such as a Hot Work Permit.

Pre-Entry Atmospheric Testing

Prior to entry, the space will be monitored in the following order, unless measured simultaneously.

- Oxygen Levels - the oxygen level of the space will be between 19.5% and 23.5% Oxygen. An oxygen level below 19.5% will be considered oxygen deficient and an asphyxiation hazard (IDLH).
- An oxygen level above 23.5% will be considered oxygen enriched and a flammable hazard (IDLH) Combustible gas/vapor - Any combustible gas/vapor/mist above 10% of its Lower Explosive Limit (LEL) will be considered a flammable hazard (IDLH).
- Toxic - Any level above the Permissible Exposure Limit (PEL) established by OSHA or a level exceeding any other applicable Federal or State standard will be considered an atmospheric hazard.
- Atmospheric testing will be conducted for the initial evaluation, after installation of engineering controls (such as ventilation or inerting), and at the specified frequency specified on the confined space EP. Testing shall be from top to bottom over the area to be entered. If atmospheric testing is outside of the required range, additional controls are required to enter. Ventilation is the preferred control.
- If work in the confined space continues for more than one shift, and continuous monitoring is not used, atmospheric tests shall be repeated before entry, each shift, unless otherwise specified on the entry permit. More frequent analysis may be required based on conditions.

Reclassification of a Permit-Required Confined Space

VSCC treats all confined spaces as permit required until initial testing. Once the testing is completed the spaces will be classified as either Permit Required or Non-Permit Required.

If at any time the space meets all of the conditions below, the confined space may be reclassified as a non-permit confined space by EH&S.

If the confined space is reclassified, the Director of Environmental Health & Safety shall certify that it meets all reclassification requirements by making a signed and dated notation on the permit stating that the confined space was reclassified as a non-permit confined space.

The permit will be used to document the evaluation, and define the period for which the space may be entered as a non-permit confined space. Changing the work being performed or changing conditions requires a re-evaluation of the confined space.

A permit-required confined space may be reclassified as a non- permit space under the following conditions:

- pre-entry testing performed from outside the space shows no hazardous atmosphere,
- there is no potential for the development of a hazardous atmosphere,
- there are no other hazards in the space, or
- hazards can be eliminated without entry into the space. (Ventilation does not meet this requirement.)

The reclassification is in effect for as long as the hazard(s) remain eliminated. If an unexpected hazard arises during the entry, the entry will be immediately terminated.

Lockout/Tagout

In a permit-required confined space where the potential for an uncontrolled energy release (electrical or mechanical) exists, the lockout/tagout procedures as outlined in VSCC Lockout/Tagout Program will be applicable.

Use of Power Tools or Lights

All electrical tools will either be of low voltage design (battery operated) or used with a ground fault circuit interrupter.

Adequate low voltage lighting must be provided or used in conjunction with a ground fault circuit interrupter. In some situations, it may be necessary to require explosion proof lighting. Where necessary, this will be specified on the permit.

All tools and equipment operated off of temporary wiring or extension cord(s) will be protected with a ground fault circuit interrupter.

Isolation of Lines

Various means of isolating lines (steam, chemical, water, etc.) carrying solids, liquids, or gases to the space may be used. These include:

- double block and bleed,
- slip blinds,
- blanks, or
- physical separation and misalignment at connections closest to the space, with ends capped, blinded, or plugged.

Permit-Required Confined Space Communication

All identified permit-required confined spaces will be posted with signs to prevent unauthorized entry and to facilitate hazard identification except as noted below. **Exceptions: All Sewers and ventilation systems may not be posted.**

During entry, confined space openings will be barricaded or roped off to prevent personnel or objects from falling into the space.

A trained attendant will be provided for all permit-required confined space entries.

Prior to entry, a system of communication between the entrant and attendant and between the attendant and rescue team will be determined. Communications between the entrant and attendant could consist of visual observation, voice communications, hand signals, motion detector alarms, radio contact, or other forms. If portable radios or cellular telephone are relied upon to call for assistance, the Attendant shall test the equipment by calling from the confined space location prior to entry.

Prohibited Conditions

- Any entry by unauthorized personnel.
- The use of internal combustion engines inside a confined space.
- The use of compressed gas cylinders inside of a confined space (excluding breathing air used for respiratory protection) or leaving compressed gas lines unattended.
- The use of fuel burning heaters (unless vented and specified on the entry permit and used with continuous atmospheric monitoring) inside the confined space.
- Rescue attempts by untrained or improperly equipped rescuers.
- Use of Air purifying respirators in IDLH atmospheres.
- Powered winches (electrical, pneumatic, hydraulic, or internal combustion engines) for personnel rescue.
- Entry into a permit-required confined space possessing an engulfment hazard without a retrieval system.
- Entry into a permit-required confined space without the assignment of an authorized attendant.
- Any activity not identified on the entry permit.

Employee Training

All employees involved in permit-required confined space shall be trained prior to work assignments.

Training records will be maintained for the length of employment of the trainee. These records will include the employee's name, the signature of the trainer, and the training date.

Rescue

Rescue programs will be determined prior to entry into a permit-required confined space. Rescue activities that require confined space entry shall be performed by local Emergency Management Personnel. Non-entry rescues may be performed by using the rescue line attached to the entrants harness.

- Authorized entrant and attendant training will include confined space hazard recognition, symptom recognition, and the importance of self-rescue.
- Whenever feasible, the confined space should be outfitted for non-entry rescue.
- No VSCC employees have been trained in confined space rescue and should never attempt a confined space rescue.
- Gallatin PD is called (452-1313) and placed on stand-by during each permit-required confined space entry. Call 452-1313 or 911 for rescue.

Appendix A

VSCC Confined Space Entry Permit