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University of Vermont
Department of Environmental Health and Safety
Permit-Required Confined Space Entry Program
in accordance with
OSHA 29 CFR 1926 Subpart AA

REVISED AND DISTRIBUTED BY:
THE UNIVERSITY OF VERMONT
DEPARTMENT OF ENVIRONMENTAL HEALTH AND SAFETY
OCCUPATIONAL HEALTH AND SAFETY

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Confined Space Entry Program
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Introduction

The Vermont Occupational Safety and Health Administration (VOSHA) set forth the requirements of working in confined spaces (29 CFR 1926 Subpart AA). The regulation contains requirements for practices and procedures to protect employees from the hazards posed by entry into confined spaces. The distinction between confined spaces and permit spaces is crucial to understanding what the standard requires. Briefly, a permit space is a confined space containing a serious hazard(s) or potential hazard(s). The University of Vermont Competent Person from the Occupational Health and Safety office must evaluate all confined spaces to determine whether they are a "confined space" and/or a "permit space".

Although the University recognizes VOSHA standard 1910.146 (Permit Required Confined Spaces for General Industry), the University has concluded that following the newer standard 1926 Subpart AA (Confined Spaces in Construction) is more protective for employees, therefore the University will adhere to the 1926 Subpart AA standard.

Responsibilities

A **Competent Person** is "one who is capable of identifying existing and predicable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has the authority to take prompt corrective measures to eliminate them". **Regardless of whom is entering the confined space only a EHS Competent Person may authorize the reclassifying of a Permit Space as a Non-Permit Space. In addition, regardless of whom is entering the confined space, only a EHS Competent Person may authorize alternative procedures for a permit space.**

The **Host Employer** is the employer that owns or manages the property where the work is taking place. For contracted projects, the University of Vermont's Hiring Manager is responsible for assuming the duties of the Host Employer for confined spaces on university property.

A **Controlling Contractor** is the employer with overall responsibility for construction at the worksite (for example, the General Contractor or Construction Project Management). The controlling contractor is responsible for coordinating entry operation when there is one or more entry employer and when other activities on the site could foreseeably result in a hazard in the permit space. In addition, controlling contractors must provide any information they have about any permit space hazards and precautions previous used in the space.

An **Entry Employer** is an employer who decides that an employee it directs will enter a permit space. There may be more than one entry employer if the employees of multiple employers must enter the space. Each entry employer is responsible for complying with all provisions in the VOSHA Confined Space Standard and their written program except those specifically imposed on the controlling contractor.

Where the host employer has information about permit space hazards on the site, it must share that information with the controlling contractor, who is then responsible for sharing it with the other employers on the site, including but not limited to the entry employer. The following **Table 1** outlines the duties of employers under the Confined Spaces Standard and this Program.

TABLE 1 – *Duties of Employers*

Category of Employer	**Employer Responsibilities**
All Employers	● Identify all confined spaces in which their employees may work and determine whether any are permit spaces. If an employee is required to enter permit spaces, the employer becomes an "entry employer." ● Employers who are not "entry employers" must make sure their employees stay out of any permit spaces present on the site unless the employees are authorized for entry.
Entry Employers	● Protect employees against permit space hazards by complying with the standard. ● Inform controlling contractor of the program to be followed as well as any known hazards that could be encountered in permitted spaces.
Controlling Contactors	• Share information the contractor has about permit space hazards with entry employers and other employers whose activities may create hazards in the permit space. ● Coordinate entry operations when there is more than one entry employer. ● Coordinate worksite operations when permit space entry occurs during other activities at the site that might create a hazard in the space. ● For scheduled entries notify EHS 24-hours prior to entry for auditing purposes.
Host Employers	● Share information it has about permit space hazards with the controlling contractor. Transfer of information shall be documented.

It should be noted that it is the responsibility of all Entry Employees and Controlling Contractors to arrange for or provide their own rescue service as required under in 29 CFR 1926 Subpart AA. The University of Vermont, Physical Plant Department has an internal rescue team that has been established solely for the purposes of rescue for its employees.

This written program establishes the procedures to be used by Physical Plant employees for entry into all Confined Spaces defined by OSHA as meeting the following criteria:

- Is large enough and so arranged that an employee can bodily enter it.
- Has limited or restricted entry or exit (for example, tanks, vessels, silos, storage bins, hoppers, vaults, and pits are spaces that may have limited means for entry)
- Is not designed for continuous employee occupancy.

A space has a limited or restricted means of exit if a person could not readily escape from the space in an emergency. Any of the following factors indicate that a workspace has a limited or restricted means of exit:

- The need to use a ladder or movable stairs, or stairs that are narrow or twisted.
- A door that is difficult to open or a doorway that is too small to exit while walking upright.
- Obstructions such as pipes, conduits, ducts, or materials that a worker would need to crawl over or under or squeeze around.
- The need to travel a long distance to a point of safety.

Entry into a confined space has occurred if any part of the person's body breaks the plane of an opening to a confined space. Confined spaces that can typically be encountered by Physical Plant personnel include tanks, concrete vaults, sumps, boilers, tunnels, and exhaust systems.

Program

The Department of Environmental Health and Safety is committed to adequately safeguarding all their employees during the performance of their jobs. This program is intended to identify permit required confined spaces and their hazards and provide the necessary training to facilitate safe entry. It will be the responsibility of each employee to follow the stated guidelines for confined space entry and practice safe work practices. The EHS department is responsible for implementation and review of this program.

Permit-Required Confined Spaces

A permit-required confined space (or permit space***)*** is a confined space that:

(1) Contains or has the potential to contain hazardous atmosphere.

(2) Contains a material that has the potential for engulfing an entrant.

(3) Has an internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls or by a floor which slopes downward and tapers to a smaller cross section; or

(4) Contains any other recognized serious safety or health hazard.

Examples of Permit-Required Confined Spaces include steam holes, concrete vaults and boilers.

A list of permit-required confined spaces is available on the University of Vermont, Environmental Health and Safety home page (https://www.uvm.edu/riskmanagement/confined-space-entry). The list is available to all University employees that have successfully completed training pursuant to 1926 Subpart AA.

Permit-Required Entry Procedures

Permit Required spaces are labeled with the following label:

The following items will be covered but not limited to in the specific written procedures.

1. Review the **Confined Space Entry – "Steps to Successful Entry"** contained under **Appendix A** of this report.
2. Cordon off work area.
3. Eliminate pressure buildup before entry cover is removed, if applicable.
4. Guard opening to the entrance with a railing or other barrier.
5. Review procedures necessary for safe entry with team.
6. Complete the **Confined Space Entry Permit** prior to entry and post at the entry portal. A copy of a blank permit is included in **Attachment B**.
7. Prior to an entry, the internal atmosphere must be tested, with a calibrated direct-reading instrument, for the following conditions as noted in **Table 2**:

TABLE 2

Conditions/Contaminant	Acceptable Level for Entry
Oxygen	19.5 to 23.5 percent
Flammable Gas/Vapor	<10 percent of LEL
Hydrogen Sulfide	<10 ppm
Carbon Monoxide	<10 ppm

The atmosphere tested prior to entry must be conducted at intervals of approximately every four feet vertically, with a direct reading instrument to monitor the contaminant levels.

NOTE: Use of other gas/vapor detection instruments: Should the need arise to monitor for other gases or vapors, a photoionization detector (PID) may be utilized. PID Meters are located at the Davis Zone, Environmental Safety Facility (ESF) and EHS.

ITX Four gas meter Calibration Locations:

EHS Shop – Fort Ethan Allen
Central Heat Plant - Control Room
Davis Zone – Davis Zone Shop at Loading Dock
South Zone in the Life Safety Office of Davis Building
MCM – Given Building Room E019
Trinity Zone – Trinity Zone Shop
Utilities Zone at Centennial

All four gas meters (and four gas meters with PID capabilities) will be auto calibrated when the meter is placed on the appropriate docking station. Questions regarding the meters should be directed to the EHS Occupational Health and Safety department (656-SAFE).

Entry Procedures – General

All planned entries shall occur during normal working hours between 7 AM to 3:30 PM. If entry needs to occur outside normal working hours an effort needs to be made to ensure enough rescue personnel are available.

Prior to Entry

1. Review available information on the confined space located at the EHS website.
2. Gather the appropriate equipment, for example:
    - Ventilators
    - Communications, i.e., walkie-talkie/radio, cellular phone, tag line, etc. if verbal contact cannot be maintained.
    - Personal protective equipment (PPE) including hard hats (if appropriate), gloves, safety shoes, coveralls, and respirators (when applicable)
    - Intrinsically safe lighting (labeled as Class I Division I)
    - Ladders, if needed
    - Harness, lifeline and winch or pulley
    - Air monitoring meters with alarms
    - Barriers/Shields to secure the entry site from pedestrians.
3. At a minimum of 60 minutes prior to entry, call Service Operations Support (SOS) and have them page the Confined Space Rescue Team to let them know of the planned entry and to locate the Confined Space Rescue Truck on campus.
4. Verify that the atmospheric conditions are within the acceptable ranges as noted in **Table 2**.
5. Verify that other conditions such as electrical supply, have been locked out or otherwise controlled.
6. Complete the Permit (See Appendix B).
7. If appropriate, ventilate the space using continuous forced-air mechanical systems that meet the requirements of 1926.57 (Ventilation) to control atmospheric hazards.
8. Station at least one attendant outside of each space to be entered for the entire duration of the entry whose sole responsibility is to monitor activities within the space and prevent entry by unauthorized persons.

During Entry

1. **Conduct continuous air monitoring with direct reading instruments with alarms, at the location where the authorized entrants are working.** Periodic monitoring can be utilized if the monitoring is of sufficient frequency to ensure that any atmospheric hazards are being controlled at safe levels. If continuous monitoring is not used, periodic monitoring is required with sufficient frequency to ensure that acceptable entry conditions are being maintained during the course of entry operations.

   If any of the airborne readings fall outside of the range noted above in **Table 2**, or if any of the four gas meter sensor alarms are activated, the following actions must be taken.

   a) All entrants shall leave the space immediately.
   b) Re-evaluate the atmosphere from outside the space.
   c) Implement additional measures to assure that a hazardous atmosphere will not develop prior to re-entry.
   d) Prepare a written certification indicating the date, location of space, atmospheric readings, and signature of certifying person prior to re-entry.

If for any reason the procedures and operations used at a site are judged to be inadequate by the team or the supervisor, the supervisor has the authority and responsibility to cancel the permit and revise the program to correct deficiencies.

After Entry Is Completed

1. Call Service Operations Support (SOS) and have them page the Confined Space Rescue Team to let them know that the entrance is complete.
2. Remove equipment and close the entry site.
3. Mail or email a copy of the permit to the EHS Occupational Health and Safety office.

Emergency Procedures

1. **Call Service Operations Support at 656-2560, Press #1 when recording starts for an operator to request the UVM Confined Space Rescue Team.**
2. **Call 911 for emergency services. Provide specific location of the emergency and other pertinent details of the confined space and type of emergency.**
3. **Attempt to perform a non-entry rescue.**
4. **Do not leave the area until rescue has been completed or you have been relieved of your duties by the Incident Commander.**

Personal Protective Equipment

The purpose of Personal Protective Equipment (PPE) is to shield or isolate individuals from the chemical, physical, and biological hazards that may be encountered during confined space operations, as it is not always apparent when exposure occurs. Chemicals and petroleum products can cause serious injury and death if inhaled or when coming in contact with unprotected skin.

It is important the PPE users realize that no single combination of protective equipment and clothing is capable of protecting a worker against all hazards. PPE can itself create significant hazards to the wearer such as heat stress and physical and psychological stress in addition to impaired vision, mobility, and communication. PPE should be selected on a case-by-case basis because overprotection as well as under protection can be hazardous and should be avoided.

PPE must be worn whenever the wearer faces potential hazards arising from chemical exposure.

The minimum personal protective equipment requirements in a confined space include:

- **Safety Glasses/Goggles**: to be worn at all times, if a full face-piece respirator is not donned.
- **Work Gloves**: standard work gloves - to be worn in dry conditions; nitrite or butyl rubber glove to be worn in wet conditions.
- **Safety Work Shoes/Boots**: to be worn at all times.

If conditions warrant, additional PPE must be utilized including but not limited to:

- **Respirator**: to be worn as determined by the Supervisor signing the Permit or from existing Hazard Assessment.

- **Hearing Protection:** to be worn when excessive noise requires a person to yell to communicate from a distance of 3 feet. Readings can be taken by the competent person upon request.

- **Hard Hat/Bump Hat**

In cases where employees plan to enter a Confined Space that has not been entered previously, no historical documentation of the conditions inside exists, or specific procedures have not been developed, the following is required: Contact the EHS Competent Person (656-SAFE) to develop identify hazards, develop written procedures, and determine if it is a permit space.

Contractor Requirements

University of Vermont contractors who perform entry into permit required confined spaces on site such as: tank testing, inspections, and cleaning must follow their own program and provide it for review to the EHS Competent Person prior to performing work. All contractor confined space entry programs will be reviewed to assure that they are at least as stringent as VOSHA & the University of Vermont's program. Contractors are also required to submit up to date documentation of employee VOSHA confined space training.

UVM Confined Space Rescue Team

Employees of the University of Vermont who are authorized to provide rescue services via the UVM Confined Space Rescue Team (Rescue Team) shall be provided with, and trained to use, the personal protective equipment and rescue equipment necessary for making rescues from permitted spaces. The Rescue Team will maintain a UVM Rescue Vehicle; each member of the Rescue Team will be provided with a key to the rescue vehicle.

Each member of the rescue service shall be trained to perform the assigned rescue duties. Each member of the rescue service shall also receive the training required of authorized entrants.

Each member of the rescue service shall practice making permit space rescues at least once every 12 months, by simulated rescue operations in which they remove dummies, mannequins, or actual persons from the actual permit space or from representative permit spaces.

All members of the Confined Space Rescue Team (CSRT) shall be trained in professional first-aid and in cardiopulmonary resuscitation (CPR) and the use of automated external defibrillator (AED).

Prior to permit-required confined space entry, the entry supervisor will confirm that the on-site UVM Rescue Vehicle is located on the University grounds. A means for summoning those services will be established prior to entry.

The member of the CSRT delivering the rescue vehicle to the site and will bring a 4-gas meter as well.

Rescue Procedures - General

In the case of an emergency the **Attendant** shall immediately summon the UVM Rescue Team and then the local ambulance service and fire department will be contacted. See the above section ***Emergency Procedures*** specifically page 8 of this Program.

1. Below is the Confined Space Rescue Incident Command System (ICS) Organizational Chart. It should be noted that some ICS Organizational Charts are more complex and include additional duties/roles, however it is likely that a confined space emergency on the UVM campus will be relatively minor in nature, and therefore not require a significant amount of staff/roles. If the incident remains small then one person can assume multiple roles. The ICS is able to expand if the incident grows in order to keep an efficient span of control.

2. The first Rescue Team member to arrive on site shall assume the role of **Incident Commander** and begin to select a safe and logical command post upwind from the incident. The Incident Commander should assign the role of **Safety Officer. Attendant** shall maintain duties of the Attendant and continue to monitor the atmospheric conditions. The Incident Commander (or any other role in the ICS) may relinquish his/her role to a more experienced team member or to a member of another rescue team (such as Burlington Fire Department).

3. A "hot zone" and "warm zone" shall be set established under coordination of the Safety Officer.

4. Non-Entry Rescue shall be attempted before entry-rescue is considered.

5. Rescuers will be designated as Entry Team 1 and Back-Up Entry Team and shall consist of a minimum of two people per team.

6. Rescuers will be provided with their own atmospheric testing equipment and shall not rely on the monitoring device used by the original entrants.

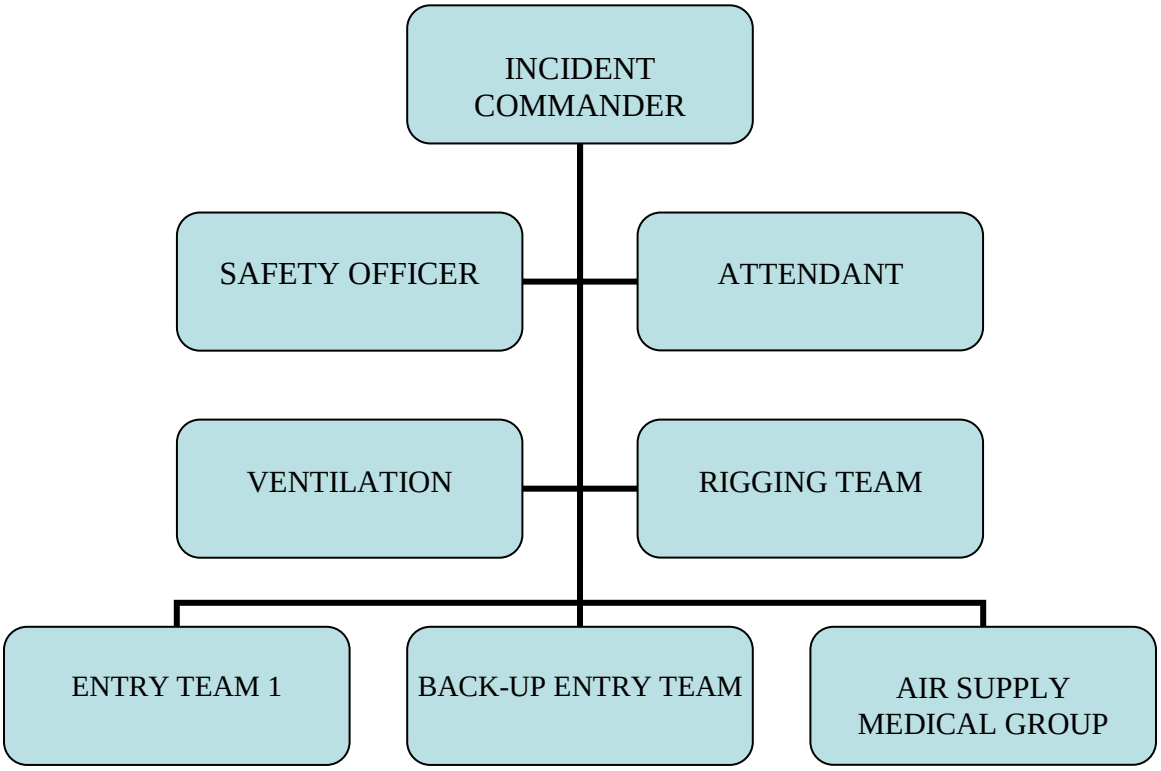
7. Rescuers will enter confined spaces for rescue purposes using SCBA (or an airline with 30-minute escape bottle). An additional air line or 30-minute breathing air cylinder will be brought into the confined space for each victim, if possible.

8. Atmospheric conditions in the confined space will be continuously monitored and rescuers will evacuate immediately if dangerous conditions are encountered.

9. The back-up entry team shall be prepared to enter the confined space as called upon by the Incident Commander.

10. Remove the victim as quickly as possible through the use of a ladder, backboard, or other means, guiding the victim over obstructions and through turns and openings.

UVM Confined Space Rescue Team
ICS Organizational Chart for Small Incident



Training

The University of Vermont will provide training to each employee whose work is regulated by the Standard, at no cost to the employee, and ensure that the employee possesses the understanding, knowledge, and skills necessary for the safe performance of the duties assigned under the Standard. All training will be conducted pursuant to Section 1926.1207 of the Standard.

Program Critique

All confined space permits are to be copied and forwarded to the EHS Occupational Health and Safety office who will review the permits annually, or sooner. Changes will be made as needed to update the program and correct noted deficiencies.

Definitions

Incident Commander: Responsible for overall management of the incident. Directly controls the command staff and the section chiefs.

Safety Officer: Responsible for developing and recommending measures for assuring personnel safety and to assess and/or anticipate hazardous and unsafe situations, should not have any other responsibilities to distract them from primary duty. In large operations, the safety officer may have additional safety personnel assigned to specific areas of the operation who report to him.

Public Information Officer: Responsible for developing and releasing information about the incident to the news media, incident personnel and to other appropriate groups or agencies. University Communications Phone: (802) 656-2005

Air Supply: Responsible for all air supply, bottles, supplied air breathing apparatus and any other related items as they apply to the use of SAR< SCBA and he related breathing air supply.

Medical Unit: Responsible for the medical care of rescuers, which includes baseline readings for medical monitoring of the rescue team.
Attendant: Has many of the same duties as for work entry; communicating with the entry team, air monitoring, tracking entrants and equipment.

Ventilation: Responsible for ventilation inside and outside of the confined space.

Entry Team: Performs all duties inside the confined space, such as reconnaissance, patient packaging and extrication.

Back-Up Team: Ready to make entry if the entry team needs rescue.

Rigging Team: Responsible for the coordination and evacuation of patient and entry teams and operation of retrieval systems There maybe more than one rigging system involved whit the rescue operation. One required to gain access to the space, for example, a tripod over an opening and the top of a tank, and another to get the subject from the top of the tank to the ground. If a rigging system is required within the confined space, that will need to be constructed by the entry team.

Decon: responsible for all decontamination operations.

Medical Group: Responsible for medical care of patient(s).