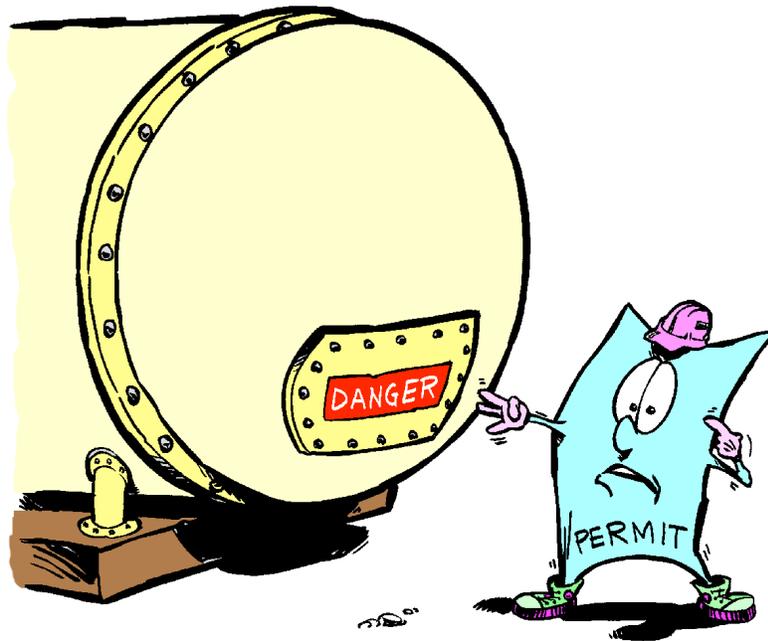


# UNIVERSITY OF PITTSBURGH

## CONFINED SPACE ENTRY PROGRAM



Prepared by the  
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## I. POLICY

The University of Pittsburgh endeavors to protect its employees and others involved in confined space work by implementing this Permit Required Confined Space Entry Program. The University intends to limit the entry of employees into areas posing special dangers due to their configuration or other features, and achieve acceptable environmental conditions for individuals working in such areas.

The University recognizes that confined space entry may pose a variety of hazards to its employees. The procedures developed within this program shall be followed by all employees to ensure these hazards are adequately controlled. Employees should recognize the hazards associated with confined space entry and should never trust their senses to determine if an area is hazard free. Whenever an employee feels a hazard may be present he/she shall immediately leave the area and notify his/her supervisor or foreman.

As a general rule, the University of Pittsburgh does not intend to have its employees enter permit required confined spaces and every effort will be made to eliminate the hazards and declassify the spaces accordingly.

When appropriate, the University will utilize alternate procedures specified by OSHA's Standard 1910.146(5)(c)(ii) for entering a permit space when:

- A. Demonstration that the only hazard posed by the permit space is an actual or potential hazardous atmosphere.
- B. Continuous forced ventilation alone is sufficient to maintain the space safe for entry and monitoring data documents that a safe entry condition exists.
- C. Periodic monitoring supports that the forced ventilation is preventing accumulations of hazardous atmospheres.

## II. PURPOSE

The purpose of this program is to develop, implement, and maintain practices and procedures to protect employees from hazards associated with permit required confined spaces. The program was designed to comply with Code of Federal Regulations (CFR) Title 29 Labor (OSHA) part 1910.146 - Permit-required confined spaces.

## III. SCOPE AND APPLICATION

This program covers all work done by, at the request of, or for the University of Pittsburgh including any of its entities and representatives. Confined space entry guidelines used by any of the aforementioned persons must, at a minimum, meet the requirements of this program.

## IV. DEFINITIONS

"Acceptable entry conditions" - the conditions that must exist in a permit space to allow entry and to ensure that employees involved with a permit-required confined space entry can safely enter into and work within the 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 employer's permit 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 (such as a spectacle blind or a skillet blind) that completely covers the bore and that is capable of withstanding the maximum pressure of the pipe, line, or duct with no leakage beyond the plate.

"Confined space"-a space that:

- (1) It is large enough and so configured that an employee can bodily enter and perform assigned work; and;
- (2) Has limited or restricted means for entry or exit (for example, tanks, vessels, silos, storage bins, hoppers, vaults, and pits are spaces that may have limited means of entry.) and;
- (3) Is not designed for continuous employee occupancy.

Some examples of confined spaces are: Manholes, storage tanks, utility vaults, pits, boilers, furnaces, pipe tunnels, sewers...

"Double block and bleed"- the closure of a line, duct, or pipe by closing and locking or tagging 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 finely divided (with flowing, liquid-like properties) 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. Entry includes ensuing work activities in that space and 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 (permit)" - the written or printed document that is provided by the employer to allow and control entry into a permit space and that contains the information specific to that location for safe entry.

"Entry supervisor" - the person (such as the employer, foreman, or crew chief) responsible for determining if acceptable entry conditions are present at a permit space where entry is planned, for authorizing entry and overseeing entry operations, and for terminating entry as required by this section.

NOTE: An entry supervisor also may serve as an attendant or as an authorized entrant, as long as that person is trained and equipped as required by this section for each role he or she fills. Also, the duties of entry supervisor may be passed from one individual to another during the course of an entry operation.

"Hazardous atmosphere" - an atmosphere that may expose employees to the risk of death, incapacitation, impairment of ability to self-rescue (that is, escape unaided from a permit space), injury, or acute illness from one or more of the following causes:

- (1) Flammable gas, vapor, or mist in excess of 10 percent of its lower flammable limit (LFL);
- (2) Airborne combustible dust at a concentration that meets or exceeds its LFL;  
NOTE: This concentration may be approximated as a condition in which the dust obscures vision at a distance of 5 feet (1.52 m) or less.
- (3) Atmospheric oxygen concentration below 19.5 percent or above 23.5 percent;
- (4) Atmospheric concentration of any substance for which a dose or a permissible exposure limit is published in 29 CFR Subpart G, Occupational Health and Environmental Control, or in 29 CFR Subpart Z, Toxic and Hazardous Substances, of this Part and which could result in employee exposure in excess of its dose or permissible exposure limit;

NOTE: An atmospheric concentration of any substance that is not capable of causing death, incapacitation, impairment of ability to self-rescue, injury, or acute illness due to its health effects is not covered by this provision.

For air contaminants for which OSHA has not determined a dose or permissible exposure limit, other sources of information, such as Material Safety Data Sheets that comply with the Hazard Communication Standard, section 1910.1200 of this Part, published information, and internal documents can provide guidance in establishing acceptable atmospheric conditions.

"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.

"Immediately dangerous 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.

"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. NOTE: This procedure 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.

"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.

"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.

"Permit-required confined space (permit space)" - a confined space that has one or more of the following characteristics:

- (1) Contains or has a potential to contain a 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. "Permit-required confined space program (permit space program)" means the employer's overall program for controlling, and, where appropriate, for protecting employees from, permit space hazards and for regulating employee entry into permit spaces.

"Permit system" - the employer's written procedure for preparing and issuing permits for entry and for returning the permit space to service following termination of entry.

"Pre-Entry / Entry Checklist" - the form used to determine the safety of a confined space. This form referred to as the 'checklist' is to be used to reclassify a permit space to "Non-Permit".

"Prohibited condition" - any condition in a permit space that is not allowed by the permit during the period when entry is authorized.

"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. Testing includes specifying the tests that are to be performed in the permit space.

## V. EMPLOYEE TRAINING AND DUTIES

### A. Authorized Entrants

All employees who work as authorized entrants will be trained to perform the following duties:

#### 1. Hazard recognition

Authorized entrants will be trained to know the hazards they may confront, to recognize the effects of those hazards and to understand the consequences of exposure to those hazards.

#### 2. Communication

Authorized entrants will be instructed on both the methods that will be used to maintain contact with the attendant and the means of notifying the attendant of their intent to self-initiate an evacuation.

#### 3. Protective equipment

Authorized entrants will be made aware of the personal protective equipment, such as respirators, harnesses and lifelines, needed for safe entry and exit. They will be provided with the necessary personal protective equipment and instructed on its proper use. Entrants will be made aware of the external barriers needed to protect themselves from external hazards and instructed on the proper use of the barriers.

#### 4. Self-rescue

Authorized entrants will be trained to exit a permit space without assistance (self-rescue) whenever it is physically possible to do so. Entrants will be trained to exit a permit space, if possible, when the attendant orders evacuation, an automatic alarm sounds or if they perceive they are in danger.

### B. Authorized Attendant

An authorized attendant shall be stationed and remain outside the permit space at all times during entry operations. Attendants will be trained to perform the following duties:

### **1. Accountability**

Attendants shall be instructed to know, at all times during the entry, how many persons are in the permit space so that no one is accidentally left in the space when it is returned to service.

### **2. Hazard recognition**

Attendants will be trained to know and recognize potential permit space hazards and the effects of the hazards. Attendants will also be trained to monitor activities inside and outside the permit space to ensure that no hazards exist.

### **3. Communication**

Attendants shall be instructed to maintain continuous and effective contact with authorized entrants.

### **4. Evacuation**

Attendants shall be instructed to immediately evacuate authorized entrants from the permit space when:

- A condition arises that is prohibited in the entry permit;
- Behavioral effects of hazard exposure are detected;
- A situation outside the permit space, which could endanger the entrants, is detected;
- An uncontrolled hazard within the permit space is detected;
- If the attendant is monitoring entry in more than one permit space and he/she must focus attention on the rescue of entrants in one of those spaces; or
- The attendant must leave the work station.

### **5. Unauthorized Persons**

The attendants shall be trained to take the following action when unauthorized persons approach or enter a permit space while entry is underway:

- Warn the unauthorized person away from the space,
- Request the unauthorized person to immediately exit if they have entered the permit space,
- Inform the authorized entrants and any other designated persons if unauthorized persons have entered the permit space.

### **6. Rescue**

The attendants shall be trained to summon rescue and other emergency services as soon as they determine that authorized entrants need to escape from permit space hazards.

Attendants shall be instructed not to enter the permit space to attempt rescue of entrants.

Attendants will be trained to perform all other assigned rescue and emergency duties without entering the permit space.

### **7. Protective Equipment**

Attendants shall be trained to properly use all rescue equipment provided for their use.

Attendants will be made aware of the external barriers needed to protect authorized entrants from external hazards and instructed on the proper use of the barriers.

### **C. Individuals Authorizing or in Charge of Entry**

The individuals who authorize or are in charge of entries will be trained in respect to administrative, technical and managerial aspects of confined space entry and will be empowered to terminate the entry whenever unacceptable conditions are present. They will be trained to be able to determine if the permit contains all requisite information and be able to assure that relevant procedures, practices and equipment are in place before allowing entry. They will be trained to perform follow-up audits during the entry to assure that conditions remain consistent with the terms of the permit.

NOTE: Authorized attendants and individuals who authorize or are in charge of entries may enter a permit space only if they have received proper training.

Employee training in Confined Space requirements is available through the Environmental Health and Safety Department.

## **VI. ENTRY PROCEDURES**

### **RECLASSIFICATION OF PERMIT REQUIRED CONFINED SPACES**

Spaces that meet the definition of a confined space must be entered under the procedures for Permit Required Confined Spaces unless they can be reclassified as non-permit confined spaces under the following procedures:

1. If the permit space poses no actual or potential atmospheric hazard and if all hazards within the space are eliminated without entry into the space, the permit space may be reclassified as a non-permit confined space as long as the non-atmospheric hazards remain eliminated.

2. In order for a space to be permanently reclassified as a "non-permit confined space" its potential hazards must be properly evaluated. This should include developing monitoring and inspection data. There must be a signed document permanently declassifying each space, and it must be available to employees assigned to enter the space. Continuous atmospheric monitoring must be utilized in all declassified confined spaces that have any "potential" for atmospheric contamination. Also, no single employee may be assigned to enter a confined space even if it has been classified as a "non-permit confined space".

( i.e. If it meets the definition of a confined space, there must be more than one employee assigned. )

3. If it is necessary to enter the space to eliminate hazards, such entry shall be performed under the "Permit System" part of this Program. If testing and inspection during that entry demonstrate that the hazards within the space have been eliminated, the

permit space may be reclassified as a non-permit confined space for as long as the hazards remain eliminated.

4. The supervisor or foreman must verify that all hazards in the permit space have been eliminated, by utilizing the Pre-Entry Checklist. The Checklist section must be completed and indicate the date and location of the space. The Checklist must be made available to each employee entering the space.

5. If hazards arise within a permit space that has been reclassified to a non-permit space, each employee in the space shall exit the space. The entry supervisor or foreman and crew members shall then reevaluate the space and determine whether it must be reclassified as a permit space.

The following procedures are to be followed by all employees who are involved with the entry of permit spaces:

1. The supervisor or foreman from the department which needs to enter a permit space for maintenance or service, shall prepare the permit space for entry by completing the following safety precautions and documenting the information on an entry permit.
  - a) Identify all possible hazards in the permit space.
  - b) Notify affected departments of service interruption.
  - c) Lock out and/or tag out all isolating devices in compliance with established University procedures.
  - d) Clean, drain, wash and purge the area.
  - e) Provide necessary ventilation system(s).
  - f) Assure emergency response team is available.
  - g) Inform employees of specific permit space hazards.
  - h) Review procedures with each employee.
  - i) Determine if hot work is necessary.
  - j) Determine what safety equipment (respirators, communication aid, etc.) is required for entry and work, specify it, and provide it for the employees( who must be trained in its use.)
  - k) List all authorized entrants, authorized attendants and individuals eligible to be in charge of the entry.
  - l) Post signs near the permit space to notify employees what hazards may be present and that only authorized entrants may enter the permit space.
  - m) Place barriers, where necessary, in order to protect entrants against external hazards and to protect bystanders from an accidental fall through, or inadvertent entry into the opening.
  - n) Take all other precautions necessary for safe entry.
2. The Supervisor or Foreman shall inform the Department of Environmental Health and Safety that permit space entry is required and that he/she has taken all necessary precautions to ensure safe entry. A University designated employee will conduct the proper atmospheric testing in the permit space and document the results on the entry Permit provided by the supervisor or foreman.

3. After the trained tester completes the atmospheric testing, he/she shall return the entry permit to the respective Supervisor or Foreman.
4. The Supervisor or Foreman shall take the entry permit to Environmental Health and Safety Department for authorization. (This step may be eliminated if Supervisors or Foremen have authorization approval).
5. The individual authorizing the entry permit shall complete the section of the entry permit listed as "AUTHORIZATION" after he/she determines all necessary precautions have been taken to ensure safe entry and all requisite information is on the entry permit.
6. The permit is limited to the date and time identified on the permit or checklist. Permits are good for one 8 hour shift only. They can be extended to a maximum of 16 hours, if the same crew continues on the job and then only after an atmospheric check. A new permit must be completed for each space on each day.
7. After the entry permit is authorized, work in the permit space can begin. All specifications of the entry permit for that permit space must be followed. The individual authorizing the entry permit or the person in charge of entry (supervisor or foreman) can cancel the entry authorization and terminate entry whenever they determine entry operations are not consistent with the terms of the permit and/or acceptable entry conditions are not present
8. Testing of the atmospheric conditions in the permit space shall take place in compliance with the guidelines established in Section VIII. of this program.
9. The entry permit shall be canceled by the individual who authorized it, after entry is completed, and all entrants have exited the permit space.
10. The individual who authorized the entry permit shall keep a copy of it on file and send the original entry permit to the Department of Environmental Health and Safety.

## VII. ATMOSPHERIC TESTING

The "Sentinel 4 Personal Gas Monitor" (available through the Department of Environmental Health and Safety) or a similar approved device shall be used to test the atmospheric conditions of permit spaces. When testing for atmospheric hazards, first test for oxygen ( >19.5% and <23%), then for combustible gases or vapors ( <10%), and then for toxic gases and vapors ( < established TWA or PEL ).

Atmospheric testing will be performed:

- Prior to an employee entering a permit space.

- Continuously when welding, cutting, brazing, painting, or degreasing is being performed in the permit space.
- Prior to an employee re-entering the permit space after any break.
- Any time it is perceived necessary in order to ensure acceptable atmospheric conditions.

Testing shall be performed at various levels of the permit space (top, middle and bottom), If testing reveals an unacceptable atmospheric condition, the permit space must be ventilated and re-tested before an employee can enter. If ventilation is not possible and entry is necessary, entrants must have appropriate respiratory protection.

### **VIII. EQUIPMENT**

Personal protective equipment such as respirators, lifelines, safety harnesses, communication equipment, ventilation equipment, protective clothing, hearing and eye protection, signs and barriers, and all other equipment necessary to protect the well being of the authorized entrants will be provided and maintained by University of Pittsburgh. All employees who will be using such equipment will be properly trained on its use. In specific situations such as respirator use, employees will be given complete physicals, fit tests and all other necessities as required by law. All portable electric tools and lighting used in a confined space must be powered through a GFCI.

All equipment must be approved by the individual authorizing the entry permit in order to be used during the entry. If the equipment has not been approved it cannot be used.

### **IX. RESCUE**

In the event that rescue of an entrant becomes necessary, the authorized attendant will immediately contact the Campus Police at 412-624-2121 to request an outside rescue team. The services of the City of Pittsburgh Fire Department will be utilized for the rescue of entrants and for any other emergency situation that arises (i.e., explosion, etc.).

The authorized attendant will NOT enter the permit space to attempt rescue unless he/she is properly trained to do so, is equipped to perform the rescue without endangering themselves or others involved, and has been relieved by another equipped and trained attendant. Rescue from outside the space with available equipment such as a tripod and winch with attached lifeline and harness is permitted.

Personnel from the City of Pittsburgh who may be involved in rescue of an entrant or involved in an emergency situation will be informed of the potential hazards they may confront when called in to perform service by the authorized attendant.

## **X. CONTRACTORS**

If an outside contractor is to perform maintenance or service in a permit space, the University of Pittsburgh will provide them with all available information on the permit space hazards. The contractor will be required to maintain their own Confined Space Entry Program that, as a minimum, meets the requirements of 29CFR1910.146. The contractor will supply all equipment, including but not limited to; Gas testing & monitoring equipment, retrieval/rescue equipment, PPE and ventilation equipment. The University of Pittsburgh Environmental Health and Safety Department reserves the right to terminate any confined space project involving contractors when, in their opinion, the contractor employee(s) or others have the potential for injury or illness on University property.