

# Permit-Required Confined Space Entry Program—6100-2.0

## Associated OHS Process: General Industry and Construction Safety

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## 1. Summary

### 1.1 Objective

This Permit-Required Confined Space Entry Plan (PRCS) provides policies and procedures to ensure the safety of University of Virginia (UVA) Facilities Management (FM) employees and contractors working for UVA and to comply with all regulations that pertain to permit-required confined spaces.

### 1.2 Scope

This program covers all UVA FM employees, contractors while performing work at the university, and other workers that may be involved in permit-required confined space entry.

## 2. Regulations & Other Requirements

### 2.1 Occupational Safety & Health Administration

This Permit-Required Confined Space Entry Plan complies with all regulations that pertain to permit-required confined spaces including OSHA 29CFR1910.146, *Permit-Required Confined Spaces (General Industry)* and OSHA 29 CFR1926, Subpart AA, *Confined Spaces in Construction*.

### 2.2 University of Virginia

This Permit-Required Confined Space Entry Plan complies with UVA-FM requirements.

## 3. Roles and Responsibilities

### 3.1 Facilities Management Occupational Health & Safety

Specific responsibilities of FM-OHS related to permit-required confined space entry:

- a) Assist with assessment of confined spaces
- b) Provide training
- c) Assist with air monitoring or any other facet of a confined space operation upon request

### 3.2 Facilities Management Supervisors

Specific responsibilities of FM Supervisors related to permit-required confined space entry:

- a) Shall ensure that a thorough assessment of UVA property has been conducted by qualified persons to identify and document permit-required confined spaces. Subsequent assessments shall be conducted as new construction and renovation is completed.
- b) Shall ensure that all permit-required confined spaces permits are labeled “DANGER – CONFINED SPACE – ENTER BY PERMIT ONLY”
- c) Shall ensure that all employees performing permit-required confined space work have been trained and fully understand the requirements of this program
- d) Shall provide the necessary equipment to comply with these requirements and ensure that all employees are trained on its use
- e) Shall ensure that provisions and procedures are in place for the protection of employees from external hazards—including but not limited to pedestrians, vehicles, and other barriers—by use of the pre-entry checklist verifying that conditions in the permit space are acceptable for entry during its duration

- f) Shall ensure an annual review of the program, including all entry permits issued during that annual period
- g) Shall ensure that all closed permits are maintained in each department for review and kept on file for at least one year

### 3.3 Facilities Management Employees

Specific responsibilities of FM employees related to permit-required confined space entry:

- a) Shall attend Permit-Required Confined Space Entry Training commensurate with their duties and when duties change as required
- b) Shall comply with all aspects of this program
- c) Authorized Entrants, Attendants and Entry Supervisors may be any UVA employee authorized by management to work in a permit-required confined space setting and that has been trained and is proficient in the understanding of program requirements

### 3.4 Entry Supervisor/Competent Person Duties

- a) Shall evaluate all confined spaces prior to entry to determine if they meet the definition of a permit-required space and to identify all hazards to entrants. Particular attention shall be given to hazards located inside and outside the space, atmospheric hazards, introduced hazards, engulfment hazards and others.
- b) Shall have a pre-work safety meeting with all workers to be involved in the permit-required confined space entry and review the job to be performed and determine what safety concerns may be present
- c) Shall confirm that all isolation, lockouts, and tagouts have been completed prior to entry into a permit-required confined space
- d) Shall ensure that the requirements of this program are followed and maintained
- e) Shall test all atmosphere conditions prior to entry and shall complete and maintain the permit-required confined space permit form, and have it accessible for review on the job site at all times.
- f) As necessary, shall provide for early-warning system means to alert authorized Entrants and Attendants that an engulfment hazard may be developing from rain runoff or other hazards. Examples of early-warning systems include, but are not limited to: alarms activated by remote sensors or persons strategically stationed as lookouts with equipment for immediately communicating with the authorized Entrants and Attendants.

### 3.5 Attendant Duties

- a) Remains outside the permit-required confined space during entry operations until relieved by another Attendant
- b) Knows the hazards that may be faced during entry, including information on the mode, signs or symptoms, and consequences of the exposure
- c) Is aware of possible behavioral effects of hazard exposure in authorized Entrants
- d) Monitors activities inside and outside the permit-required confined space to determine if it is safe for Entrants to remain in the space and orders the authorized Entrants to evacuate the permit-required confined space immediately under any of the following conditions:
  - If the Attendant detects a prohibited condition, including unacceptable air-quality
  - If the Attendant detects the behavioral effects of hazard exposure in an authorized Entrant

- If the Attendant detects a situation outside the space that could endanger the authorized Entrants
  - If the Attendant cannot effectively and safely perform all the duties required
- e) Maintains an accurate count of authorized Entrants in the permit-required confined space
  - f) Continuously maintains verbal or electronic means of communication. If communication is lost, all Entrants should exit the confined space until communication can be restored.
  - g) Summon rescue and other emergency services as soon as the Attendant determines that authorized Entrants may need assistance to escape from permit-required confined space hazards
  - h) Ensure that unauthorized persons do not approach or enter a permit-required confined space
  - i) Allow no one to interfere with the Attendant's primary duty to monitor and ensure the safety of authorized Entrants
  - j) Authorized Attendants shall not monitor more than one PRCS at a time

### **3.6 Entrant Duties**

- a) Knows the hazards that may be faced during entry, including information on the mode, signs or symptoms, and consequences of the exposure
- b) Uses appropriate personal protective equipment properly, e.g., face and eye protection, and other forms of barrier protection such as gloves aprons, coveralls, and breathing equipment
- c) Is aware of possible behavioral effects of hazard exposure in authorized Entrants
- d) Shall witness and verify calibrated air monitoring data and if approved, sign off, before entry is made
- e) May request additional monitoring at any time
- f) Maintain communication with the Attendants to enable the Attendant to monitor the Entrants status as well as to alert the Entrant to evacuate if needed
- g) Exit from permit-required confined spaces as soon as possible when ordered by an Attendant or Entry Supervisor, when the Entrant recognizes the warning signs or symptoms of an exposure exists, when a prohibited condition exists, or when an alarm is activated

## **4. Permit-Required Confined Space Entry Program**

### **4.1 Classification of PRCS**

- a) By definition, “confined spaces” do not present hazards to workers and may be entered at any time by workers with no additional precautions required by this program. Labeling of confined spaces is not required.
- b) However, hazards can be introduced into confined spaces that may result in a change of status to “permit-required confined space.” Welding, use of chemical and gases, or any other recognized serious safety or health hazard may result in space reclassification.
- c) The Entry Supervisor/Competent Person will determine whether or not the space will be reclassified based on any introduced hazards. Spaces reclassified as permit-required confined spaces will be entered using the procedures contained in this program.

### **4.2 PRCS Entry Procedures**

- a) A PRCS may ONLY be entered if the space is properly isolated and results of air-monitoring are acceptable. (Forced-air ventilation must be used continuously at all times.)

- b) At least three employee roles are required to be present for PRCS entry: the Entry Supervisor, an Attendant, and an Entrant. Depending on the situation, the Entry Supervisor may assign multiple Attendants and Entrants. The Entry Supervisor may also serve as the Attendant or Entrant.
- c) All entries into permit-required confined spaces require the following steps be taken unless the “Alternative Entry Procedures,” listed subsequently, are used. The Entry Supervisor is responsible for ensuring that all steps are taken.
  - 1) The Entry Supervisor must review the space to be entered and the tasks to be performed in order to identify hazards and formulate an entry plan.
  - 2) The Entry Supervisor shall confirm that any required isolation, lockouts, and tagouts have been completed prior to entry.
  - 3) The Entry Supervisor shall ensure that all PRCS participants have been trained and authorized.
  - 4) The Entry Supervisor shall ensure that the requirements of this program are followed and maintained.
  - 5) The Entry Supervisor shall ensure that effective air-monitoring is conducted.
  - 6) The Entry Supervisor shall complete the UVA Permit-Required Confined Space Entry Permit before proceeding with work.
  - 7) The Entry Supervisor shall conduct a pre-work safety meeting with all workers involved in the PRCS to review the tasks to be performed, the procedures to be followed, and to discuss safety concerns.
  - 8) Attendants and Entrants shall review and sign the PRCS Entry Permit.
  - 9) The Entry Supervisor must provide and erect adequate signage/barricades to protect site workers from fall hazards and to ensure that persons not involved with the PRCS entry are not exposed to hazards.
  - 10) All Entrants must sign in and out on the entry permit prior to entering and upon exiting a permit-required confined space. The back of the permit or a sign-in sheet may be used for this purpose.
  - 11) At least one trained Attendant must always be stationed outside the PRCS to monitor the authorized Entrants for the duration of the entry operation.
  - 12) If a hazardous atmosphere is detected during an entry, personnel must immediately evacuate the space. In addition:
    - The Entry Supervisor shall cancel the entry permit.
    - Re-evaluate the space to determine how the hazardous atmosphere developed
    - Take action to protect personnel before any subsequent activity to re-enter the space takes place
    - Re-issue the UVA Permit-Required Confined Space Entry Permit before allowing Entrants to re-enter the space
    - Entrants are entitled to request additional monitoring at any time.
  - 13) The permit must be terminated when the entry operations are complete or when permit conditions change (i.e., hazardous air monitoring results are noted, unsafe behaviors are observed, etc.).

#### 4.3 ALTERNATIVE PRCS Entry

When the Alternative Entry Procedure can be used, the amount of personnel, equipment, and resources traditionally used to enter permit-required confined spaces can be drastically reduced. In fact, many UVA

permit-required confined space entries may be safely entered by one person working alone as long as they have training and authorization to enter and perform work in permit-required confined spaces and follow the alternative entry procedures. Contact FM-OHS prior to making the determination that Alternative Entry can be used.

#### 4.3.1 Conditions for Use

- a) **Alternative entry procedures may only be used when all of the following conditions are met:**
  - 1) **The only hazard posed by the space is an actual or potential hazardous atmosphere**
  - 2) **Forced-air ventilation is used continuously and is sufficient to maintain the space safe for entry**
  - 3) **Continuous air-monitoring and inspection data confirms that ventilation alone ensures acceptable entry conditions**
- b) If an initial entry of the permit space is necessary to effectively sample for acceptable entry conditions, the entry must be performed as per the standard permit-required confined space entry procedure.

#### 4.3.2 Alternative Entry Procedure

To use the alternative entry procedure, perform all of the following:

- 1) Ensure that the ONLY hazard posed by the space is an actual or potential atmospheric hazard; there can be no engulfment, entrapment by inwardly converging walls or other serious recognized hazards present
- 2) Notify supervision of the intent to enter a PRCS using alternative entry procedures; include estimated time of work to commence and to end
- 3) Open the access to the space and guard it effectively with a portable barrier to prevent others from falling into the space and to prevent objects from falling into the space
- 4) Arrange and direct continuous forced-air ventilation into the space where the work will be taking place
- 5) Conduct remote air-monitoring to ensure acceptable entry conditions and allow the air-monitoring equipment to run continuously throughout the course of the work. Entrants may not enter the space until the forced air ventilation has eliminated any hazardous atmosphere.
- 6) Share air-sampling results with all Attendants and Entrants
- 7) Fill out the entry permit and leave it near the entrance of the permit-required confined space
- 8) Each Entrant must carry personal air-monitoring equipment to alert him/her to hazardous air quality
- 9) Enter space, perform work
- 10) Upon completion of work, close out entry permit and send to supervision and safety for recordkeeping
- 11) Notify supervision that permit-required confined space operations are complete

#### 4.4 Pre-Job Planning and Space Preparation

- a) The Entry Supervisor must determine that the permit-required confined space is properly isolated by blinding, disconnecting, and/or by following local lockout/tagout procedures.
- b) The Entry Supervisor must discuss with all Entrants the hazards of the space, communication methods and emergency procedures during the permit-required confined space entry.
- c) Eliminate any condition making it unsafe to open the equipment to atmosphere



- d) Promptly guard the opening to prevent an accidental fall through the opening and to protect each employee working in the space from foreign objects entering the space
- e) If applicable, wash, steam, ventilate or de-gas the permit-required confined space to properly free it of possible contaminants. Vent vapors to a safe location.
- f) Do not allow unauthorized personnel to enter a permit-required confined space. Barricade and/or guard all confined spaces to prevent entry of unauthorized Entrants.
- g) If performing hot work in the permit-required confined space, precautions must be taken consistent with the UVA Hot Work Permit procedure.
- h) Ensure that vehicle or other equipment exhaust does not enter the space

#### 4.5 Pre-Entry Safety Meeting

- a) The Entry Supervisor must declare when the permit-required confined space is ready for entry.
- b) The Entry Supervisor shall hold a pre-entry safety meeting to discuss all requirements and procedures with all authorized Entrants and Attendants involved with the entry. He/she will discuss all recognized safety concerns such as hot-work to be performed in the space, use of chemicals, personal protective equipment etc. during this meeting.
- c) The Entry Supervisor must coordinate entry operations when UVA workers and contractors are working simultaneously in the PRCS.

#### 4.6 Air Monitoring

Air monitoring is a cornerstone of safe permit-required confined space entry. The Entry Supervisor shall be responsible to ensure that air monitoring is conducted in accordance with the program, including:

- a) **Prior to PRCS entry and without entering the space, the Entry Supervisor shall test the internal atmosphere with a calibrated, multi-gas, direct-reading instrument fitted with a remote-sampling tube/apparatus. This unit shall be considered the primary air-monitoring device.**
- b) Air quality results must be documented on the entry permit prior to the initial entry, following each work break, lunch and whenever conditions warrant additional testing.
- c) The instrument must be designed to sample oxygen content, flammable gases and vapors, and for potential toxic air contaminants, in that order.
- d) All Entrants and Attendants must be made aware of the air-monitoring results and have the opportunity to observe the pre-entry testing.
- e) Employees are entitled to request additional air monitoring at any time.
- f) After the initial sampling, the air-monitoring equipment shall remain outside the space and shall be used to sample the space continuously. The Entry Supervisor or Attendant shall direct all Entrants to immediately exit the space if the air-monitoring equipment indicates poor air quality.
- g) The Entry Supervisor must enter air sampling results from the primary sampling device on the entry permit prior to entry and after each break. Air monitoring results and the entry permit will be accessible for review at the jobsite at all times by any PRCS participant.
- h) In addition to the primary air-monitoring device stationed outside the space, each Entrant must carry a personal multi-gas, air-monitoring device at all times during the PRCS entry.
- i) All air-monitoring equipment must be used, maintained and calibrated as per the manufacturer.

#### 4.7 Ventilation

**Continuous forced-air ventilation of the permit-required confined space shall be provided prior to entry and throughout the duration of work in permit-required confined spaces.**

Continuous forced-air ventilation must be used and tested as follows:

- a) An employee may not enter the space until the forced-air ventilation has eliminated any hazardous atmosphere.
- b) The forced-air ventilation shall be so directed as to ventilate the immediate areas where an employee is or will be present within the space and shall continue until all employees have left the space.
- c) The air supply for the forced-air ventilation shall be from a clean source and may not increase the hazards in the space.
- d) The atmosphere within the space shall be continuously monitored to ensure that the continuous forced-air ventilation is preventing the accumulation of a hazardous atmosphere. Any employee who enters the space shall be provided with an opportunity to observe the periodic testing and may request additional monitoring at any time.
- e) If a hazardous atmosphere is detected during entry, each employee shall leave the space immediately and the space shall be evaluated to determine how the hazardous atmosphere developed; and measures shall be implemented to protect employees from the hazardous atmosphere before any subsequent entry takes place.

#### 4.8 Horizontal Permit-Required Confined Space Entry

Horizontal permit-required confined space entry presents challenges for effective air-monitoring, ventilating, and emergency retrieval/rescue.

- a) The Entry Supervisor and the Facilities Safety Department will thoroughly review all upcoming projects that involve horizontal permit-required confined space entry. When possible, linear forced-air ventilation and effective air-monitoring through multiple points along the horizontal space will be provided. The Charlottesville Fire Department will be briefed on any such upcoming projects.
- b) Task-specific procedures for each horizontal permit-required confined space entry will be developed, documented and implemented with all participants signing off, as necessary.

#### 4.9 Equipment

All work equipment shall be checked to ensure that it has the proper safety features, is approved for the locations where it will be used, and is in good working condition. The Entry Supervisor shall ensure that all equipment is properly maintained in a safe condition and that Entrants use the equipment properly.

The following equipment must be considered and may be required when entering a PRCS:

- a) **Atmospheric testing and monitoring equipment—REQUIRED**
- b) **Ventilation Equipment—REQUIRED.** Forced-air movers may be used to obtain acceptable atmospheric entry conditions. If used, the ventilation equipment must be configured to provide forced air at all times. An additional exhaust system may be used to rid a space of welding fumes.
- c) **Personal Air-Monitoring equipment for each Entrant to be worn for the duration of the entry—REQUIRED**
- d) **Signs and Barricades.** Post signs and barricades outside the permit-required confined space to notify personnel that a PRCS entry is in progress and unauthorized entry is prohibited.

- e) **Portable barricade.** Erect the portable barricade around the opening to provide fall protection for attendants and others.
- f) **Communications Equipment.** If necessary, use a communication system that will enable the Attendant to remain in constant, direct communication with the Entrant(s) working in the permit-required confined space. Only use intrinsically safe equipment in areas where a hazardous atmosphere may exist. Also, use a communication system that allows the Attendant to summon help from rescue or emergency service.
- g) **Entry and Exit Equipment.** Provide a ladder, if needed, for safe entry and exit.
- h) **Lighting Equipment.** Lighting equipment used in the permit-required confined space must be safe for the location. Lighting may be needed for safe entry, work within the space, and exit.
- i) **Personal Protective Equipment.** During the initial entry assessment, the Entry Supervisor must determine what personal protective equipment may be needed to protect workers from hazards. Ensure that personnel are trained to wear the required personal protective equipment.
- j) **Rescue and Emergency Equipment.** An emergency retrieval system with tripod and full-body harnesses will be provided and used whenever a vertical space must be entered, unless the retrieval system would increase the overall risk of entry or would not contribute to the rescue of the entrant.
- k) **Other.** Any other equipment deemed necessary for safe entry into and rescue from permit-required confined spaces

#### 4.10 Issuance/Reviewing of Permit

The Entry Supervisor shall issue a completed and signed permit-required confined space permit only when all pre-entry requirements are satisfied. The permit is valid for one shift.

- a) Keep permit near entrance to permit-required confined space
- b) Include SDSs for any chemicals to be used in the space with the entry permit
- c) Retain the closed permit and forward to Safety immediately

#### 4.11 Termination and Closing or Cancelling of Permits

- a) The Entry Supervisor shall terminate the confined-space permit at the end of the job operation, at the end of the shift, or when the Entry Supervisor determines that conditions in or near the confined space have changed and are hazardous to the Entrants.
- b) The entry permit shall be immediately cancelled in the event of any unauthorized entry, identified hazards not covered by the permit, or the occurrence of an injury or near-miss. A review shall be conducted by the Entry Supervisor and the entry plan revised accordingly to provide employee protection prior to authorizing subsequent entries.
- c) The Entry Supervisor shall, at the conclusion of entry operation, close out the permit and retain the original in a department file.

#### 4.12 Multiple Employer Procedure

This procedure must be used when contractors will be performing services in PRCS with UVA workers or other contractors. To ensure the safety of all site workers, the Entry Supervisor shall:

- a) Verify that all contractors have an effective Permit-Required Confined Space Entry Program established

- b) Verify that all of the contractor's employees have been trained in permit-required confined space entry and that all of the contractor's employees fully understand the UVA procedures pertaining to confined spaces
- c) Inform the contractor that the workplace contains permit-required confined spaces and that entry is allowed only through compliance with a Permit-Required Confined Space Program meeting the requirements of this section
- d) Apprise the contractor of the elements, including the hazards identified and the employees' experience with the space, that make the space in question a permit space
- e) Inform the contractor of any precautions or procedures that UVA has implemented for the protection of employees in or near permit spaces where contractor personnel will be working
- f) Coordinate entry operations with each contractor, when both UVA personnel and contractor personnel will be working in or near permit-required confined spaces
- g) Debrief the contractor at the conclusion of the entry operations regarding the permit-required confined space program followed and regarding any hazards confronted or created in permit-required confined spaces during entry operations.
- h) In addition to complying with the permit-required confined space requirements that apply to all employees, each contractor who is retained to perform permit space entry operations shall:
  - 1) Obtain any available information regarding permit-required confined space hazards and entry operations from the UVA Entry Supervisor
  - 2) Coordinate entry operations with the UVA Entry Supervisor, when both UVA personnel and contractor personnel will be working in or near permit-required confined spaces
  - 3) Inform UVA of the permit-required confined space program that the contractor will follow and of any hazards confronted or created in the permit-required confined space, either through a debriefing or during the entry operation

#### 4.13 Rescue and Emergency Services

##### 4.13.1 Non-Entry Rescue

- a) In the event of emergency, it is preferable for Entrants to be quickly extracted from the permit-required confined space by the Attendant through use of a tripod-mounted retrieval winch system. Attendants are NEVER to enter permit-required confined spaces for any purpose, especially to attempt rescue of Entrants.
- b) Non-entry means of rescue in the form of a tripod-mounted retrieval winch system is required to be used for all vertical permit-required confined space entries unless physical restrictions do not allow space for proper setup.
- c) **Unless the attendant has the capability to retrieve an entrant without entry into the permit-required confined space, the Charlottesville Fire Department will perform all rescue services. Arrangements shall be made with the Charlottesville Fire Department to notify onsite personnel in the event rescue services are unavailable. No onsite PRCS entries can be conducted without access to rescue services or non-entry retrieval equipment.**

##### 4.13.2 Non-Entry Rescue Preparation

- a) Rescue means are required for all vertical permit-required confined space entries where there is room for a tripod-mounted retrieval winch to be properly used.
- b) To facilitate non-entry rescue, an Entrant must be attached to a retrieval system whenever he/she enters a vertical-entry permit-required confined space.

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- c) The retrieval equipment is not required if it will increase the overall risk of the entry, e.g., creating an entanglement hazard, or will not contribute to the rescue of the Entrant. Only one Entrant may be attached to the retrieval equipment at one time.
- d) Each Entrant shall use a full body harness equipped with a “D” ring located between the shoulders or above the head.
- e) The retrieval line must be attached to the “D” ring on the full body harness located on the worker’s back, between the shoulder blades. The other end of the retrieval line attached to a retrieval device located outside the space so that rescue can begin as soon as the rescuer becomes aware that rescue is necessary.
- f) All authorized permit-required confined space entry personnel must receive training on proper setup and use of the retrieval system with annual hands-on exercises.

#### 4.13.3 Emergency Services Response

If the Attendant becomes aware of the need for emergency rescue and retrieval equipment has not been used, the Attendant shall immediately:

- 1) Ensure that force-air ventilation is being directed to where the Entrant is located
- 2) Call 911 and request emergency rescue
- 3) Alert others by phone or radio without leaving scene
- 4) Instruct others to guide emergency services to the jobsite
- 5) Prevent unauthorized personnel from attempting a rescue
- 6) Notify the Entry Supervisor of the emergency
- 7) Once onsite, the rescue service must be:
  - Provided access to the permit-required confined space
  - Informed of the hazards that they may confront during a rescue

#### 4.14 Training

Training shall be provided so that all employees whose work is regulated by this program acquire the understanding, knowledge, and skills necessary for the safe performance of the duties assigned to them.

- a) Training shall be provided to each affected employee before the employee is first assigned duties under this program, if a new hazard has been created, and before there is a change in assigned duties that would require an employee to operate under this program.
- b) The employee shall be retrained:
  - 1) Whenever there is a change in confined space operations that presents a hazard about which an employee has not previously been trained
  - 2) Whenever the supervisor has reason to believe either that there are deviations from the permit-required confined space entry procedures required by this section or inadequacies in the employee's knowledge.
- c) The training shall establish employee proficiency in the duties required by this program and shall introduce new or revised procedures, as necessary.
- d) The supervisor shall certify that the training required by this program has been accomplished.
  - 1) The certification shall contain each employee's name, the name and signatures of the trainers, and the dates of training.

- 2) The certification shall be available for inspection by employees, their authorized representatives, management, clients, and the safety department.

## **5. Review and Recordkeeping**

### **5.1 Program Review**

This Permit-required Confined Space Entry Plan shall be reviewed and updated at least annually and whenever necessary to reflect new or modified procedures, technology, or equipment to protect participating workers from hazards.

### **5.2 Program Recordkeeping**

Records of this Permit-required Confined Space Entry Plan will be considered obsolete when the new version is issued. Obsolete versions will be destroyed after three years.

## Appendix A: Definitions

**Acceptable Entry Conditions** means the conditions that must exist in a confined space to allow entry and to ensure that employees involved in permit-required confined space entry can safely enter into and work within the space. Acceptable entry conditions are defined as:

- oxygen level measurements between 19.5% and 23.5%
- combustible vapors less than 10% of the lower explosive limit
- toxics less than acceptable established exposure limits

UVA personnel and contractors shall not enter permit-required confined spaces without acceptable entry conditions for any period of time nor any purpose!

**Air Monitoring** means the act of determining air-quality through the use of direct reading instruments. Continuous air-monitoring shall be maintained throughout the duration of permit-required confined space entry.

**Attendant** means an authorized individual stationed outside the PRCS who monitors the authorized Entrants and who performs all Attendant's duties assigned in the UVA Confined Spaces Program. Attendants must have sufficiently completed and fully understand the PRCS training.

**Blanking or Blinding** means 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.

**Competent Person** means one who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has the authorization to take prompt corrective measures to eliminate them. For purposes of this program, the title "competent person" shall be synonymous with "Entry Supervisor".

**Confined Space** means

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

**Construction Work** means work for construction, alteration, and/or repair, including painting and decorating.

**Double Block and Bleed** means 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** means any occurrence (including any failure of hazard control or monitoring equipment) or an event internal or external to the permit-required confined space that could endanger Entrants.

**Appendix A (Continued)**

**Engulfment** means the surrounding and effective capture of a person by a liquid or finely divided (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. Examples can include flash-flooding in storm sewers from rain runoff.

**Entrant** means an authorized individual who is trained to safely enter PRCS to perform work.

**Entry** means 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** means the written or printed document that is provided by UVA to allow and control entry into a permit-required confined space that contains the information specified in this program.

**Entry Supervisor** means the person responsible for determining if acceptable entry conditions are present at a permit-required confined space where entry is planned, for authorizing entry and overseeing entry operations, and for terminating entry as required by this section. For purposes of this program, the title "competent person" shall be synonymous with "Entry Supervisor."

- An Entry Supervisor must have sufficiently completed and fully understand the permit-required confined Space training and be approved by the HSE Manager to work in a permit-required confined space.
- An Entry Supervisor may also 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.
- The Entry Supervisor is responsible for testing and monitoring the atmosphere conditions.

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

- Flammable gas, vapor, or mist in excess of 10 percent of its lower flammable limit (LFL), (0% is normal)
- Atmospheric oxygen concentration below 19.5 percent or above 23.5 percent, (20.9 % is normal)
- Any other atmospheric condition that is immediately dangerous to life or health. (Ex.-H2S 10%, 0% is normal)

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

**Hot-Work Permit** means the written authorization to perform operations (for example, riveting, welding, cutting, burning, and heating) capable of providing a source of ignition.



## Appendix A (Continued)

**Immediately Dangerous to Life or Health (IDLH)** means 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-required confined space.

Note: Some materials—hydrogen fluoride gas and cadmium vapor, for example—may produce immediate transient effects that, even if severe, may pass without medical attention, but are followed by sudden, possibly fatal collapse 12-72 hours after exposure. The victim "feels normal" from recovery from transient effects until collapse. Such materials in hazardous quantities are considered to be "immediately dangerous to life or health."

**Isolation** means the process by which a permit-required confined 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/tagout of all sources of energy; or blocking or disconnecting all mechanical linkages.

**Oxygen-Deficient Atmosphere** means an atmosphere containing less than 19.5 percent oxygen by volume.

**Oxygen-Enriched Atmosphere** means an atmosphere containing more than 23.5 percent oxygen by volume.

**Permit-Required Confined Space (PRCS)** means 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
- 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
- Contains any other recognized serious safety or health hazard

**Permit System** means the employer's written procedure for preparing and issuing permits for entry and for returning the permit-required confined space to service following termination of entry.

**Prohibited Condition** means any condition in a permit-required confined space that is not allowed by the permit during the period when entry is authorized.

**Rescue Service** means the personnel designated to rescue employees from Permit-Required Confined Spaces.

**Retrieval System** means 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 confined spaces.

**Testing** means the process by which the hazards that may confront Entrants of a permit-required confined space are identified and evaluated.

**Appendix B: Acronyms**

FM: Facilities Management

IDLH: Immediately Dangerous to Life or Health

OHS: Occupational Health and Safety

PRCS: Permit-Required Confined Space

UVA: University of Virginia

**Appendix C.1: UVA Confined Space Entry Permit**

<b>Space to be entered</b> Date:	<b>Work to be performed</b>				
<b>Location/Building</b>	<b>Authorized duration of permit</b> From: _____ To: _____				
<b>PERMIT SPACE HAZARDS</b> (check all that apply) <input type="checkbox"/> Oxygen deficiency <input type="checkbox"/> Oxygen Enrichment <input type="checkbox"/> Flammable gases or vapors <input type="checkbox"/> Airborne combustible dust <input type="checkbox"/> Toxic gases or vapors <input type="checkbox"/> Mechanical hazards <input type="checkbox"/> Electric shock <input type="checkbox"/> Materials harmful to skin <input type="checkbox"/> Engulfment <input type="checkbox"/> Other: _____	<b>EQUIPMENT AND PPE REQUIRED FOR ENTRY</b> Continuous Forced-Air Ventilation <b>MANDATORY</b> Continuous Air-Monitoring <b>MANDATORY</b> Gloves <input type="checkbox"/> yes <input type="checkbox"/> no Protective eyewear <input type="checkbox"/> yes <input type="checkbox"/> no Protective clothing <input type="checkbox"/> yes <input type="checkbox"/> no Respirator (air purifying) <input type="checkbox"/> yes <input type="checkbox"/> no Tripod/Fall Protection <input type="checkbox"/> yes <input type="checkbox"/> no Powered Communication <input type="checkbox"/> yes <input type="checkbox"/> no Other: ADD line for personal air-monitoring device for each entrant				
<b>ADDITIONAL PERMITS REQUIRED</b> <input type="checkbox"/> LINEBREAKING <input type="checkbox"/> HOTWORK <input type="checkbox"/> Lock Out/Tag Out <input type="checkbox"/> OTHER: _____	<b>PERSONAL AWARENESS</b> <input type="checkbox"/> Pre-entry briefing on specific hazards/controls <input type="checkbox"/> All personnel completed task specific training				
<b>ATMOSPHERIC TESTING RESULTS</b> <i>Record continuous monitoring results at least every 2 hours (record additional test data on back of form)</i>					
	<b>Acceptable Values</b>	<b>Pre-entry*</b> Time: Results	Break Time: Results	Break Time: Results	Break Time: Results
<b>Oxygen % O<sub>2</sub></b>	19.5% min - 23.0%				
<b>Flammability % LFL</b>	< 10%				
<b>Hydrogen Sulfide H<sub>2</sub>S</b>	< 10 ppm				
<b>Carbon Monoxide CO</b>	< 35 ppm				
Gas Monitor Make/Model:			*pre-entry measurements recorded by Entry Supervisor		
<b><i>Determination of unacceptable conditions requires immediate notification of FM Safety and/or EHS IH</i></b>					
<b>Authorized Attendant(s) (list by name):</b> _____ _____					
<b>Authorized Entrant(s) (list by name):</b>					
	<i>Time in</i>	<i>Time out</i>	<i>Time in</i>	<i>Time out</i>	<i>Time in</i>
<b>AUTHORIZATION BY ENTRY SUPERVISOR</b>					
I certify that all required precautions have been taken and necessary equipment is provided for safe entry and work in this confined space. This permit is not valid until all appropriate items are completed and it is signed.					
SIGNATURE:			PRINT NAME:		
<b>FOR EMERGENCY RESCUE CALL CHARLOTTESVILLE FIRE DEPARTMENT 911</b>					