CONFINED SPACE PROGRAM
University of Wisconsin-Platteville
Reviewed 4/2016

This standard establishes the minimum requirements when it is required that persons enter UW-Platteville Permit Required Confined Spaces such as tanks, tunnels, pits, ducts, chambers or utility manholes.

A safe campus environment shall be provided for all UW-Platteville employees, students, guests and residents of the community. This written program complies with the OSHA’s Confined Space Standard 1910.146 and the Wisconsin Administrative Code Comm 32.29. This program is intended to protect workers from toxic, explosive, or asphyxiating atmospheres and from possible engulfment. All requirements specified in this program will apply to all UW-Platteville employees and contractors working under the direct supervision of UW-Platteville. When engineering or administrative controls will not provide and acceptable level of protection, PPE will be provided to achieve safe working conditions.

All personnel who are part of an entry team have certain responsibilities as members. All practices established by this standard are expected to be retained and demonstrated by each member of the entry team. Evaluation of confined space entry program compliance and associated recordkeeping will be completed annually by the University Risk Management Officer.

DEFINITIONS

Attendant: An individual, who is stationed outside of a permit-required confined space, monitors the authorized entrants, performs other duties for the work, and has the authority to cancel the permit if necessary and when the work is complete.

Authorized Entrant: Employee who is authorized by UW-Platteville to enter a permit required space.

Confined Space: an area that which:
1. Has adequate size and configuration for employee entry;
2. Has limited means of access or egress; and
3. Is not designed for continuous employee occupancy.

Engulfment: surrounding and effective capture of a person by a liquid or finely divided solid substance.

Entry Permit: Written or printed document provided by UW-Platteville to allow and control entry into a permit space. This document must be returned to the campus Risk Manager after expiration of the permit.

Entry Supervisor: This person is responsible for:
1. Determining if acceptable conditions are present before entering a permit space;
2. For authorizing entry;
3. Overseeing entry operations; and
4. Terminating entry
**Hazardous Atmosphere**: an atmosphere that may expose employees to the risk of death, incapacitation, impairment of ability to self-rescue, injury, or acute illness.

**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.

**Isolation**: process by which a permit space is removed from service and completely protected against the release of hazardous energy or material into the space.

**Lower Explosive Limit (LEL)**: the lowest concentration of gas or vapor; expressed in percent by volume in air that burns or explodes if an ignition source is present at room temperature.

**Permissible Exposure Limit (PEL)**: the airborne concentration of a hazardous material that must not be exceeded over a specified time or instantaneously. This value is established by OSHA.

**Permit-Required Confined Space**: a confined space that has one or more of the following characteristics:
- Contains or has the potential to contain a hazardous atmosphere
- Contains a material that has the potential for engulfing an entrant
- Has an internal configuration that can trap or asphyxiate an entrant by inwardly converging walls or by a floor that slopes downward and tapers to a smaller cross-section
- Contains any other recognized serious safety or health hazard

**Rescue Services**: personnel designated to rescue employees from permit spaces, from now on to mean the City of Platteville Fire Department.

**Retrieval System**: equipment used for a non-entry rescue of persons from permit spaces.

**POLICY AND RESPONSIBILITY**
All personnel who are part of an entry team have certain responsibilities as members. All practices established by this standard are expected to be retained and demonstrated by each member of the entry team.

**CONFINED SPACE ENTRY PROGRAM**
The confined space entry program consists of procedures to communicate the program requirements to all UW-Platteville employees as well as contractors. The program consists of the following:
- Confined space entry requirements
- Confined space entry permit
- Confined space procedures and techniques
- Training requirements for entry personnel
- Confined space rescue procedures

**PERSONNEL REQUIREMENTS AND RESPONSIBILITIES**
Attendant:
Know and recognize hazards that may be faced during entry.
Be aware of behavioral effects of exposure to hazardous atmospheres
Maintain accurate counts and means to identify all entrants.
Remain outside the space unless relieved by another qualified attendant
Monitor activities inside and outside space.
Monitor status of entrants and initiate evacuation if: 1) unsafe conditions are detected; 2) present situation may endanger the entrant; or 3) attendant cannot effectively and safely perform duties
Know proper method of summoning rescue service before entry.
Summon rescue services if needed.
Establish and maintain a means of communication, via voice, radio or telephone.
Keep unauthorized persons out of the entry space.
Perform non-entry vertical rescues using a winch.
Perform no other duties that may distract from the primary duties.

Authorized Entrant:
Know and recognize hazards that may be faced during entry.
Obtain and properly use necessary personal protective equipment.
Communicate as necessary with the attendant.
Alert attendant when hazardous conditions are detected, identified or suspected.
Exit the space immediately whenever: 1) ordered to do so by other members of the entry team; 2) warning signs/symptoms are identified; 3) prohibited conditions are identified; or 4) evacuation alarm is activated.

Entry Supervisor:
Know and recognize hazards that may be faced during entry.
Verify that all entries have been made on the permit.
Verify that tests are completed and procedures and equipment are in place.
Authorize entry to begin.
Sign permit prior to entry.
Cancel permit when job is complete or unacceptable conditions arise.
Know proper method of summoning rescue services before entry.
Ensure that responsibilities are safely and effectively transferred.
Ensure entrants have all necessary personal protective equipment.

EVALUATION OF THE HAZARDS
Before granting entry, the entry supervisor should be aware of the following possible hazards specific to a particular permit-required confined space.
Possible hazards that employees could be exposed to in a confined space are:

1. Flammable gases, vapors or mists;
2. Air-borne combustibles such as dusts;
3. Hazardous chemicals above the Permissible Exposure Levels (PELs);
4. Toxic substances commonly encountered are:
   a. Carbon monoxide, a colorless odorless gas created by internal combustion. It can kill by decreasing the capability of the blood to carry oxygen.
   b. Hydrogen sulfide is a toxic gas that quickly deadens the sense of smell.
5. Oxygen concentrations pose dangers if outside a narrow range:
   a. An oxygen deficient atmosphere contains less than 19.5% oxygen. This may not be enough oxygen to supply the employee’s respiratory needs when performing physical work. Atmospheres at 19.5% and lower are immediately dangerous to life and health.
   b. Oxygen levels above 23.5% have the potential to be an explosive atmosphere or accelerate combustion.
   c. Oxygen deficiencies could be caused by:
      i. Fire or explosion;
      ii. Displacement of oxygen by other materials such as methane, produced by rotting organic matter, or carbon dioxide produced by fermentation;
      iii. Corrosion or rust
6. Other hazards may include:
   a. Engulfment caused by finely divided, flowable solids such as grain or coal that can collapse around a person filling or plugging the respiratory system or cause death by strangulation, constriction or crushing;
   b. Poor space design. Odd shapes such as sloping sides, floors that taper to small sections, or confusing internal shapes could cause a person to become trapped and possibly cause suffocation;
   c. Combustion due to fire or explosion caused by build-up of flammable vapors, gases, or dusts which can be ignited by grinding, welding, unapproved electrical equipment, metal friction, smoking or static electricity;
   d. Heat can build up quickly in a confined space and cause exhaustion or heat stroke;
   e. Falls and slips in a confined space can be fatal. A person can be trapped in an area with low oxygen levels or toxic gases. Rungs, railing, and walking surfaces in damp environments are dangerous; shallow water depths could cause drowning;
   f. Noise reverberates in a confined space; workers may not be able to hear important directions or warnings. Over time, permanent hearing problems could develop;
   g. Mechanical hazards pose special problems in confined spaces; valves and pipes not disabled may explode, moving parts are dangerous; equipment must be locked out/tagged out before entering.

ATMOSPHERIC REQUIREMENTS PRIOR TO ENTRY
Before entering, the following atmospheric conditions must be met:
• Oxygen level (must be between 19.5% and 23.5%)
• Flammable gas, vapor, or mist (below 10% of the lower explosive limit).
• Hydrogen sulfide (below 10ppm)
• Other toxic gas levels (below OSHA permissible exposure limits).

Entry into a permit-required space will not be allowed if monitoring indicates deficiency in any of these categories.

ENTRY AND EXIT
The extent of entry and exit precautions needed to maintain a safe confined space work area must be determined for each confined space entry location. All necessary entry and exit equipment shall be identified on the applicable permit. The following items shall be evaluated and considered:

• Type of confined space to be entered
• Barriers within the space
• The occupancy load of the space
• Time required for emergency exiting

CONFINED SPACE PERMIT PROCEDURES
Confined space entry permits are required for entering any permit-required confined space. To obtain a permit, the entry supervisor must first confirm that work cannot be accomplished without entering the space. If work requires entry, a permit will be completed by the entry supervisor and the Risk Management Officer.

The entry supervisor must make all determinations regarding the safe entry into the space. The entry supervisor, following all requirements will grant or refuse entry into the space after reviewing the monitoring the results.

If entry is granted the completed permit will be posted or otherwise made readily accessible to all authorized entrants. All authorized entrants will review the permit, review rescue procedures and don any personal protective equipment before entering the space. The entry team will contact Protective Services before entering the space.

Permits are only valid up to eight (8) hours. Some exceptions may be granted with specific approval from the Safety and Risk Management Department.

The entry supervisor is required to terminate an entry or cancel the permit when the job is complete or a prohibited condition arises in the work area. Upon termination/cancellation, Rescue Services must be notified that the entry team(s) has emerged from the space. The permit can then be mailed or delivered to the Safety and Risk Management Department. All permits will be retained for 1 year.
HAZARD CONTROL

Lockout and Tagout

If activation of electrical or mechanical equipment would cause injury to confined space entrants, then the equipment shall be removed from service and stored energy must be released to prevent inadvertent activation before workers enter the confined space.

All confined spaces shall be completely isolated from other systems such as feed lines for liquids, solids or gases, by physically disconnecting, double-blocking and bleeding, or blanking off all feed lines. In a continuous system where complete isolation is impossible, such as sewers, specific procedures for isolation shall be prepared and followed. Shut off valves servicing the confined space shall be locked in the closed position and tagged for identification.

LABELING REQUIREMENTS

Where possible, each permit-required confined space should be labeled indicating that special precautions must be taken prior to entering the space. The signage for each space will read:

DANGER
Confined Space
Enter by Permit Only

Some variation will be allowed as long as the general message is clearly conveyed.

At minimum, all confined spaces deeper than 4 feet or the employee’s shoulder height (whichever is less) shall be required to have a ladder securely fixed within the space. This ladder shall not be removed until all employees have exited the space.

EQUIPMENT AND TOOLS

Confined space entry shall be allowed only when all equipment necessary for a safe entry has been assembled and shown to be in proper working order. Equipment that may be necessary includes:

1. Atmospheric testing equipment (worn by entrant and continuous monitoring via probe from the top of the confined space)
2. PPE
   a. Hardhat
   b. Safety glasses
   c. Work gloves
   d. Tyvek suit if applicable
3. Communication devices, and
4. Entry and exit and rescue equipment.
   a. Harness with tripod
All equipment and tools to be used within a confined space shall be inspected and meet the following requirements:

- Hand tools shall be kept clean and in good repair and selected according to intended use.
- If portable electrical tools and equipment are used, they shall be equipped with a ground fault circuit interrupter and checked before use within a confined space.
- All electrical cords, tools, and equipment shall be of heavy-duty type with heavy-duty insulation and inspected for visual defects prior to use.
- All equipment that may be used in a flammable atmosphere shall be explosion-proof or intrinsically safe for the atmosphere involved.
- Lighting used within a confined space shall be of explosion-proof design and equipped with guards. Lighting must be listed by the Underwriters Laboratories for use in Division 1 atmosphere of the appropriate class and group, or be approved by eh U.S. Bureau of Mines, the Mine Safety and Health Administration, or the U.S. Coast Guard.
- Lighting shall not be hung by electrical cords unless specifically designed for that purpose. The illumination of the area shall be sufficient to provide for safe work conditions.
- Cylinders of compressed gases shall never be taken into a confined space. When not in use, cylinders shall be turned off at the cylinder valve and capped. This restriction does not apply to self-contained breathing apparatuses or resuscitation equipment.
- Any hot work (such as welding, burning, or use of open flame) must follow guidelines.

**MONITORING**

Prior to entry into each confined space a sample for the following atmospheric conditions in the listed order:

- Oxygen level (must be between 19.5% and 23.5%)
- Lower explosive limit (cannot exceed 10%).
- Hydrogen sulfide (cannot exceed 10ppm)
- Other toxic gas levels as able.

The entrant will be wearing a monitor at all times. There will also be continuous monitoring from the outside of the confined space via a probe.

**COMMUNICATION**

Each entry team is required to establish and maintain communication with its members during the course of work. In instances where distance or surrounding noises prohibit visual or audible communication, 2-way radios will be used. Radio or telephone communication must be readily available to the attendant for emergencies. The attendant is responsible for establishing and maintaining a means of communication, via radio, telephone, or cellular telephone.

Signs will be situated outside of the confined space indicating a worker is in the confined space to warn others not a part of the team.
AUTHORIZATION FOR ENTRY
Prior to entry, the entry team is required to notify Rescue Services as to the location, time of entry, and number of personnel entering the permit-required space. The entry team must notify Rescue Services when entry activities are complete.
If the entry team will be intending to enter more than 1 confined space- they must notify Rescue Services or dispatch prior to entry into each confined space.

TRAINING
Training shall be provided to all UW-Platteville Facilities Management employees and employees supervising contractor personnel entering confined spaces. Supervisors tasked with overseeing projects shall verify that all contractor personnel have received training and are proficient and certified in their duties as required by this program.
Employees actually entering confined spaces must have the training described below for non-permit required and permit-required confined spaces before entry and must be briefed on site-specific hazards while on site.
Non-Permit Required Confined Space Training
UW-Platteville personnel performing non-permit required confined space entry shall receive training in the following:

• Definition of confined spaces
• Recognition, evaluation, and control of chemical and physical hazards within a confined space
• Requirements of the confined space standard and the UW-Platteville confined space entry program
• Use and limitations of atmospheric testing and PPE

Permit-Required Confined Space Training
As a policy, UW-Platteville employees shall not enter permit-required confined spaces. However, should special circumstances require such work, UW-Platteville employees involved in the permit-required confined space entries shall receive training as necessary to safely perform the following assigned duties:

• **Authorized Entrant**-shall be trained and knowledgeable in the following:
  o The hazards of confined space entry, including being able to recognize the signs, symptoms, and consequences of the hazard exposure
  o Know how to use needed equipment
  o Communication with attendants as necessary and be able to alert attendants to the warning signs or the existence of a hazardous condition
  o Exit as quickly as possible whenever ordered or alerted to do so

• **Authorized Attendants**-shall be trained and knowledgeable in the following:
- The hazards of confined spaces and how to monitor confined space conditions to determine if it is safe for entrants to remain in the space
- The behavioral effects of potential exposures
- Maintain continuous count and identification of personnel in the permit space
- Remain outside the space until relieved
- Communicate with entrants as necessary to monitor entrant status
- May not perform other duties that would interfere with their primary duty to monitor and protect the safety of authorized entrants.
- Monitor activities inside and outside the permit space and order evacuation if required
- Summon rescuers if necessary
- Prevent unauthorized entry into permit space
- Perform non entry rescue if required
- The reasons to order an evacuation, such as (1) observing conditions not allowed on the permit, (2) observing dangerous situations outside the space, (3) observing behavioral effects in authorized entrants, and (4) if the attendant must leave the work station or cannot safely perform his or her duties.

- **Authorized Supervisor**
  - Issues the confined space permit
  - Must know the hazards of the confined space.
  - Verify that all tests have been conducted and all procedures and equipment are in place before endorsing a permit, terminate entry if necessary, cancel permits, and verify that rescue services are available and the means for summoning them are operable.
  - Remove unauthorized individuals who enter the confined space
  - Determine if shifts and entry supervisors change, that acceptable conditions, as specified in the permit, continue.

**CONTRACTOR COORDINATION**

All turnkey contract jobs requiring confined space entry will require submittal of the contractor’s confined space entry plan before the commencement of work. All regulatory requirements of 1910.146 “Permit-Required Confined Spaces” will be followed by the contractor. The contractor must furnish all equipment required for entry.

In instances where both UW-Platteville employees and contractors are serving as entrants, UW-Platteville will perform all duties prior to entry. In addition, UW-Platteville will furnish communication equipment and personnel to serve as attendant and entry supervisor.

**ANNUAL REVIEW of Confined Spaces**
The UW-Platteville Confined Space Entry Program will be reviewed annually to determine its effectiveness. Utilizing canceled permits and other available information the safety department will determine if:

- Additional hazards have been identified within a given space;
- Additional measures should be taken to protect the entrants;
- Additional spaces should be included within the program and
- Some locations can be removed from the program