# REQUIREMENTS FOR WORKING IN CONFINED SPACES

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## 0.0 Authority

0.1 OP 34.## - Confined Space Policy

## 1.0 Purpose

1.1 This document establishes safety requirements for all work conducted within confined spaces on the Midwestern State University campus.

1.2 The compliance with this procedure does not preclude or preempt the applicability of any other governmental or industry standard, procedure or policy.

1.3 A space is considered to be “confined” if it meets certain criteria (see OP 34.##). Once it has been determined to meet the definition of a confined space, then it must further be determined if a permit will be required to enter. This policy addresses the requirements for entering both permit-required confined spaces and non-permit-required confined spaces.

## 2.0 Training Requirements

2.1 General. Departments shall ensure that all employees who may enter a confined space in the course of their employment are aware of the appropriate procedures and controls for entry and, also, are aware that unauthorized entry into such spaces is forbidden. Employees shall be made aware that the consequences of unauthorized entry can be fatal, and that their senses are unable to detect and evaluate the severity of atmospheric hazards.

2.2 Training for person authorizing or in charge of entry. In addition to the requirements of paragraph 2.1, the person authorizing or in charge of entry shall be trained to:

1. Recognize the effects of exposure to hazards reasonably expected to be present;
2. Carry out those duties that the entry permit (if applicable) assigns to the person authorizing or in charge of entry.

2.3 Training for entrants. Departments shall ensure that all authorized entrants know the emergency action plan and have received training covering the following subjects prior to entering any permit-required confined space:

1. Hazard recognition. Departments shall assure that every employee, before entering a confined space containing a potentially hazardous environment, understands the nature of the hazard, and the need to perform appropriate testing to determine if it is safe to enter.
2. Use of personal protective equipment. Employees shall be taught the proper use of all personal protective equipment, including respirators and clothing required for entry or rescue.
3. Self-rescue
    - Employees must be trained to exit from the confined space as rapidly as they can without help (self-rescue) whenever an order to evacuate is given by the attendant, whenever an automatic evacuation alarm is activated, or whenever employees recognize the warning signs of exposure to substances whose presence in the confined space is known or expected.
    - Employees shall be made aware of the toxic effects and symptoms of exposure to anticipated hazardous materials that may be absorbed through the skin, inhaled, or ingested, or which may be carried through their skin by solvents they are using. They shall also be trained to relay an alarm to their attendant and to attempt self-rescue immediately on becoming aware of these effects.
4. Special work practices or procedures. The employer shall train employees in any modifications of normal work practices that are necessary for confined space work.

2.4 Training for attendant. The attendant for a permit-required confined space shall be trained in the department's emergency action plan, the duties of the attendant, and in:

1. Proper use of the communications equipment furnished by the department for communicating with authorized entrants or summoning emergency or rescue services;
2. Authorized procedures for summoning rescue or other emergency services;
3. Recognition of the early signs of intoxication caused by contaminants whose presence are anticipated to be in the space;
4. The requirements of paragraph 6.2 if the permit (if applicable) specifies that the attendant function will alternate among the authorized entrants; and
5. In accordance with section 9.0 if the attendant will have rescue duties that could require entry.

2.5 Responsibilities.

1. Risk Management & Safety will develop and maintain the general training, located on the Facilities Services website, and maintain certification records of all employees trained and tested in confined space entry and operations.
2. Each department must provide site-specific training that covers the specific hazards in their spaces, and any other information that would be unique to the department.
3. Department supervisors are responsible for ensuring employees are properly trained and knowledgeable in the duties required for confined space entry.

2.6 Retraining. Re-training is required in the following instances:

1. Whenever there is a change in a confined space that presents new hazards,
2. If an employee's knowledge or execution of confined space procedures demonstrates the need for retraining.

3. Every 3 years for all employees involved in confined space operations.

## 3.0 Entry into Non-Permit-Required Confined Spaces

3.1 All confined spaces are considered to require a permit, unless and until a determination has been made by Risk Management & Safety Department of Facilities Services that the space does not require a permit.

3.1 Confined spaces that have been determined to not require a permit may be entered for normal activities without a permit.

3.2 Entry into non-permit-required confined spaces does not require an attendant.

3.3 Tunnels.

1. The walkable tunnels on campus are classified as non-permit-required confined spaces during normal activities. Normal activities performed in the tunnel include routine inspections/walkthroughs, meter readings, and cleaning of non-hazardous debris.
2. To provide additional protection to employees, a gas detector and communication device must be used for each group/party while in the tunnels.
3. Certain activities and conditions may introduce hazards to entrants that are normally not present. As such, when the following activities/conditions take place in the tunnel, a permit will be required:
    - Any hot work, such as cutting, welding, brazing
    - Any hot tapping
    - Any damaged utility lines are present
    - Energized electrical work.
    - Purging or bleeding lines.
    - Introduction of more than 1 gallon of any type of chemical at any one time.
    - Collapse of any walls or ceilings

3.4 Elevator Pits

1. Elevator pits five feet or less in depth may be considered for reclassification to a non-permit required confined space. All elevator pits greater than five feet in depth are permit required spaces.
2. Elevator pit entry procedures for routine inspection and maintenance (i.e., no car movement and no hazardous work) are listed below.
    - Notify Central Plant at x4202
    - De-energize electricity in cars
    - Erect barricade across opening to pit
    - Remotely test atmosphere and document readings
    - Make entry wearing test meter and two way radio
    - Notify Central Plant when work is completed

**4.0 Entry into Permit-Required Confined Spaces:** to lower the risk associated with confined spaces, the department must use an entry permit to document the hazards of the space and the means of ensuring employee safety during entry. The entry permit process guides the supervisor and workers through a systematic evaluation of the space to be entered. Before each entry, a permit will be completed by the supervisor, approved by

Risk Management & Safety, contents communicated to all employees involved in the operation, and conspicuously posted near the entry.

4.1 Duties of the Person Authorizing or in Charge of Entry: The person in charge of entry must:

1. Complete the “Confined Space Entry Permit”
2. Request approval from Risk Management & Safety. In cases of emergency, Central Plant personnel with appropriate education, training, and experience with confined spaces, can sign and approve the permit.
3. Describe any additional hazards that may be reasonably expected to be generated by entrants' activities in the space and specify all special work practices or procedures to be followed;
4. Post the approved signed form conspicuously at the entry location.

4.2 The permit may be revoked/cancelled by the attendant, the person in charge of entry, or Risk Management & Safety personnel at any time.

4.3 An entry permit shall be required for entry into all confined spaces on campus that have been determined to need a permit prior to entry. If no determination has been made by Risk Management & Safety Department of Facilities Services, the space is considered a permit-required confined spaces unless/until it is reclassified by Risk Management & Safety Department of Facilities Services as non-permit-required.

4.4 The entry permit shall authorize entry only by authorized entrants into a specific confined space, for a specific purpose, with entry by a specific shift or work crew permitted for a period not to exceed 8 hours.

4.5 Two persons at all times. There must be an Authorized Attendant and an Authorized Entrant.

4.6 The permit must be conspicuously posted at the entrance to the confined space before entry is made and remain posted until the permit expires or the work has been completed.

4.7 **Before Entry:** Entry into a permit-required confined space shall not be made unless the following steps have been completed.

1. Testing of Equipment: Test all air monitoring equipment before each entry, in accordance with the manufacturer’s instructions. Do not enter if monitoring equipment is not working correctly.
2. Visual Inspection of Entrance Area: inspect the area outside of the entrance to ensure there is no operating equipment or vehicles in the vicinity that could contaminate the air quality. Keep running vehicles away from the permitted space. Entryway to the space should be secured. If doors, manhole covers, screens, etc., are required to be left open, they must be manned or properly barricaded.
3. Isolation of Hazardous Energy: Insure that all lines containing harmful agents, such as supply, discharge, overflow, vent, drain, or similar connections entering the space are physically separated, isolated or blocked by means of blinds or other devices, capable of ensuring complete closure. Steam lines running into and through confined spaces shall be double valved off from non-confined space locations and allowed to cool before entry is made into such spaces.
    - Exception: fire suppressants and extinguishing systems will not be blocked / obstructed.
    - Exception: where there is no foreseeable exposure to physical hazards, AND when physical hazards are contained or enclosed in protective systems, AND when there is no immediate risk of direct exposure to the contained hazard. Examples are: electrical hazards that are enclosed in conduit or enclosures; other hazards such as steam, water, or liquids, that are enclosed in mechanically and structurally continuous

runs of piping; no visible or suspected steam leaks; no corroded piping; no other known conditions that could result in the potential release of hazardous energy.

- Exception: Any procedure approved by the Associate Vice President of Facilities Services or the Risk Management and Safety Manager.

4. Inactivation of Mechanical Devices: Fixed mechanical devices or equipment, the operation of which might endanger the employee or cause additional hazards, shall be rendered inoperable by physically disconnecting power sources.

5. Lock Out / Tag Out: Lock out/tag out all mechanical, pneumatic, electrical equipment, and steam lines within the confined space necessary for the work required within the confined space. Check operation to verify lock-out.

6. Atmospheric Testing: The atmosphere within the confined space shall be tested to verify the oxygen concentration is adequate. Entry into the confined space is not allowed if the oxygen concentration is less than 19.5% or greater than 23.5%. The atmosphere in the confined space shall also be tested to verify that combustible gas concentration is less than10% of the lower explosive limit and, when there is reason to suspect their presence, that there are no air contaminants in excess of maximum exposure levels specified in CFR 1910 Subpart Z or the American Conference of Governmental Industrial Hygienist (ACGIH) TLV booklet (latest edition). Carbon Monoxide must be less than 35ppm, and Hydrogen Sulfide must be less than 10 ppm.

   - Ventilation: If the tests made in accordance with the above paragraph indicate that the atmosphere is unsafe, the space shall be ventilated until concentrations are returned to a safe level before any personnel are permitted to enter the confined space. Ventilation shall be continued for the duration of the entry.
   - Respirator: As an alternative to ventilation, or if ventilation does not adequately reduce or remove the hazardous substance, personnel may enter a confined space only if wearing an appropriate respirator in accordance with the requirements of OSHA 1910.146 and/or 1926.AA. If the employee uses an air supplied respirator (self-contained breathing apparatus or a type C airline respirator), sufficient primary air capacity shall be available as well as reserve capacity to perform the task inside the confined space. The wearer of the respirator may not be permitted to remain in the confined space when the primary air system is depleted or is being replaced. The reserve air supply shall be used only in the event of an emergency.

7. Trained Employees: The employees working inside and outside the confined space shall be adequately trained in confined space entry, and shall be notified of the hazards specific to this confined space.

8. Use of Open Flames: When open flames are used in a confined space, the following precautions shall be taken to protect against the accumulation of combustible gas:

   - A test for combustible gas shall be made immediately before using the open-flame device and at least once per hour while using the device; and
   - A fuel tank (for example, acetylene) may not be in the confined space.

9. Provision of Required Equipment:

   1. Provision has been made for constant communication with an attendant in the immediate vicinity who is not in the confined space (this may be by being in constant visual sight);

   2. Provision has been made for communication equipment for the attendant to summon emergency or rescue services;

   3. Provision has been made for adequate rescue equipment specifically designed for rescue from the confined space in which work is being performed;

4. Ladders or other safe means shall be used to enter and exit manholes, trenches, etc. exceeding 4 feet in depth;

5. Lighting and electrical equipment, if necessary:

   - Temporary lights shall be equipped with guards to prevent accidental contact with the bulb, except that guards are not required when the construction of the reflector is such that the bulb is deeply recessed.
   - Temporary lights shall be equipped with heavy-duty electric cords with connections and insulation maintained in safe condition. Temporary lights may not be suspended by their electric cords unless cords and lights are designed for this means of suspension. Splices shall have insulation equal to that of a cable.
   - Working spaces, walkways, and similar locations shall be kept clear of cords so as not to create a hazard to employees.
   - Portable electric lighting (125 volts) shall be protected by a ground fault circuit interrupter (GFCI). Portable electric lighting used in moist or other hazardous locations (for example, drums, tanks, and vessels) shall be operated at a maximum of 12 volts.
   - All electrical equipment shall be protected by a ground fault circuit interrupter (GFCI).

9. Permit Posted: The permit must be conspicuously posted at the entrance to the confined space before entry is made, and remain posted until the permit expires or the work has been completed.

## 4.10 During Entry and While in PRCS

1. **Unsafe Atmosphere:** ***no employee or contractor shall enter any confined space in which a hazardous atmosphere has been detected.*** Whenever testing of the atmosphere indicates that levels of oxygen, flammability, or other conditions are not within acceptable limits, **entry shall be prohibited** until appropriate personal protective equipment and training has been provided.

2. Duties of the Person Authorizing or in Charge of Entry: The person authorizing or in charge of entry shall:

   - Assure that the pre-entry requirements, as indicated on the permit, are completed before any employee enters a permit-required confined space;
   - Verify that the necessary pre-entry conditions exist (does not need to personally conduct tests);
   - Verify that the means for summoning the rescue team or other emergency assistance are operable;
   - Verify that the entrant(s) and attendant(s) have the necessary and required training;
   - Ensure that the attendant knows how to communicate with the entrants and how to obtain assistance;
   - Ensure a rescue team is available and instructed in their rescue duties (e.g., an onsite team or a prearranged outside rescue service); and
   - Terminate the entry upon becoming aware of an unpermitted condition.

3. Duties of the Attendant: The attendant shall remain outside the confined space and shall:

   - Maintain continuous communication with all authorized entrants within the permit entry confined space by voice, radio, telephone, visual observation, or other equally effective means. If it is not possible for one attendant to maintain communication with each entrant because of the entrant's work station in the space, other arrangements shall be made to assure that the attendant is continuously aware of the location and condition of any entrant who is out of direct communication range;

- Not perform any other task that could potentially interfere with their ability to provide any support necessary to the entrant(s);
- Have the authority to order entrants to exit the space at the first indication of an unpermitted condition, an unexpected hazard, indication of a toxic reaction, i.e., unusual conduct by the entrants, or if a situation occurs outside the space that could pose a hazard to the entrants;
- Know the procedure and have the means to summon immediate emergency assistance if needed;
- Remain at his or her post and not leave for any reason except for health and medical reasons or by being replaced by an equally qualified individual while entry continues. The attendant shall order the entrants to exit the space if the attendant must leave and there is no replacement; and
- Warn unauthorized persons not to enter or to exit immediately if they have entered and to advise the authorized entrants as well as others required by the University.

4. Duties of the Entrant(s)

- Read and understand the entry permit requirements;
- Stay alert to hazards that could be encountered in a confined space;
- Ensure the air monitor is used continuously while in the space;
- Use all equipment required by the permit; and
- Immediately exit the confined space when:
  - Ordered to do so by the attendant;
  - The gas detector goes into alarm.
  - They perceive they are in danger;
  - They notice physiological stresses or changes in themselves or other entrants (e.g., dizziness, blurred vision, shortness of breath).

## 5.0 Contractors

5.1 University Requirements: When the University arranges to have employees of another company (contractor) perform work that involves permit required confined space entry, the assigned University employee shall:

1. Inform the contractor that the workplace contains confined spaces and that entry is allowed only through compliance with the University's Confined Space Program.
2. Provide copies of these procedures and a Midwestern State University Confined Space Permit.
3. Apprise the contractor of the elements that make the space in question a permit required confined space, including potential hazards and the University's experience with the space.
4. Apprise the contractor of any precautions or procedures that the University has implemented for the protection of employees in or near permit required confined spaces where contractor personnel will be working.
5. Coordinate entry operations with the contractor, when both University and contractor personnel will be working in or near permit required confined spaces to protect both groups of employees.
6. Debrief the contractor at the conclusion of the entry operations regarding the Confined Space Program followed and regarding any hazards confronted or created in these spaces during entry operations.

5.2 Contractor Requirements: In addition to complying with the confined space requirements that apply to all employees, each contractor who is retained to perform confined space entry operations shall:

1. Prior to entry into a confined space, demonstrate to the University that the Contractor has an active Confined Space Permit Entry program that meets minimum OSHA requirements. Provide a copy of the contractor company's Confined Space Procedures to the University prior to commencement of work.
2. Obtain any available information regarding confined space hazards and entry operations from the host employer.
3. Inform host employer of any hazards confronted or created in confined spaces through a debriefing or during the entry operation.
4. Notify Facilities Services when employees enter a confined space and when all employees have exited the confined space for the day.

## 6.0 Glossary

1. **Attendant** – A person designated by the department head in charge of entry to remain outside the confined space and to be in constant communication with the personnel working inside the confined space.

2. **Authorized Entrant** – A person who is approved or assigned by the department head in charge of the entry to perform a specific type of duty or duties or to be at a specific location at the job site.

3. **Confined Space** – A limited or restricted means of entry or exit that is large enough for an employee to enter and perform assigned work but is not designed for continuous occupancy by the employee. These spaces include, but are not limited to, underground vaults, tanks, storage bins, pits and diked areas, vessels, and boilers. **Note**: confined spaces are further broken down into either requiring a permit or not (see Permit-Required Confined Space, or Non-Permit-Required Confined Space).

4. **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.

5. **Entry Permit** – The written or printed document that is provided by the employer to allow and control entry into a permit space and that contains the information specified in this program.

6. **Entry Supervisor** – The department head or the designated representative (such as the foreman or crew lead) 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 program.

   **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 program 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 entry operation.

7. **Hazardous Atmosphere** – 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 space), injury, or acute illness from one or more of the following causes:

   - Flammable gas, vapor, or mist in excess of 10% of its lower flammable limit (LFL)

- 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 or less.*
- Atmospheric oxygen concentration below 19.5% or above 23.5%
- Atmospheric concentration of any substance for which a dose or a permissible exposure limit is published in Subpart G, Occupational Health and Environmental Control, or in Subpart Z, Toxic and Hazardous Substances, of 29 CFR 1910 and that 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, and impairment of ability to self-rescue, injury, or acute illness due to its health effects is not covered by this provision.*
- Any other atmospheric condition that is immediately dangerous to life or health. *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, section 1910.1200**, published information, and internal documents can provide guidance in establishing acceptable atmospheric conditions.*

8. **Non-Permit–Required Confined Space** - A confined space which contains secondary hazards (i.e., slips, falls, poor lighting) which are not anticipated to cause death or serious physical harm under normal operating conditions. Non-Permit Confined Spaces do not contain or have the potential to contain a hazardous atmosphere under normal conditions.

9. **Permit–Required Confined 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 that slopes downward and tapers to a smaller cross-section; or
   (4) Contains any other recognized serious safety or health hazard. Examples of serious safety or health hazards might include:
      (a) Fall hazards
      (b) Unguarded machinery
      (c) Extreme heat or cold
      (d) Steam pipes or chemical lines
      (e) Hazardous noise levels
      (f) Electrical hazards
      (g) Presence of asbestos
      (h) Potentially hazardous levels of dust