



CONFINED SPACE ENTRY PROGRAM (CSEP)

1910.146 OSHA Confined Spaces

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Introduction

Many workplaces contain areas that are considered “confined spaces” because while they are not necessarily designed for people, they are large enough for workers to enter and perform certain jobs. A confined space also has limited or restricted means for entry and is not designed for continuous occupancy. Confined spaces include, but are not limited to, tanks, vessels, storage bins, vaults, pits, manholes, tunnels, equipment housings, etc.

The biggest risk is not having enough oxygen to breathe, or asphyxiation. When there is not enough breathable oxygen or when there are toxic or poisonous substances, the atmosphere is considered asphyxiating. Such an atmosphere is dangerous not only to the employee entering the confined space but to would-be rescuers, as well. Over 60% of confined space entry deaths happen to rescuers. In addition to asphyxiation, employees face other hazards in confined space entry, including being engulfed or trapped and slipping and falling.

These spaces can present physical and atmospheric hazards that can be life-threatening but are preventable if addressed prior to entering the space to perform work.

Scope and Application

This program has been developed to protect all University employees and contractors from the serious hazards associated with entering and working within a confined space. As required by the Occupational Safety and Health Administration (OSHA) Standard 29 CFR 1910.146, Permit-Required Confined Spaces, this program establishes procedures to regulate entry into confined spaces, and to ensure the safety of the employees who enter or work in a confined space.

OSHA definition of a **Confined Space**:

1. Is large enough for an employee to enter fully and perform work.
2. Is not designed for continuous occupancy by the employee.
3. Has a limited or restricted means of entry or exit.

No confined space shall be entered until adequate precautions have been taken to ensure the safety of the employees entering the space and their surrounding work environment.

OSHA defines a **Permit-Required Confined Space** as having one or more of these characteristics:

1. Contains or has the potential to contain a hazardous atmosphere.
2. Contains a material with the potential to engulf someone who enters the space.
3. Has an internal configuration that might cause an entrant to be trapped or asphyxiated by inwardly converging walls or by a floor that slopes downward and tapers to a smaller cross section.
4. Contains any other recognized serious safety or health hazards.

Policy

All spaces owned or operated by the Western Carolina University (WCU) that meet the definition of a confined space shall be identified and appropriately marked, and access to such spaces shall be controlled.

Employees are prohibited from entering any space meeting the definition of permit required confined space, unless the following conditions are met:

1. The appropriate WCU department determines that employees must enter permit confined spaces to perform the mission of the department and/or duties of the employee.

2. The employees are trained in the entry duties under this program which they are to perform.
3. The space is rendered safe for entry by:
 - a) Issuance and compliance with the conditions of the entry permit.
 - b) The space is classified as a non-permit space.
 - c) The space is a permit space reclassified as a non-permitted space prior to entry.

Definitions

Confined Space Definitions

Confined space: A space that meets all three of the following conditions:

1. Large enough for a person to bodily enter and perform work.
2. Has only means of entry/egress that requires a person to enter by a means other than normal walking, such as crawling, squatting, climbing, bending, or use of devices.
3. Is not designed for people to continually occupy the space.

Non-Permit Space: A confined space that does not contain any actual or potential hazards capable of causing death or serious physical harm.

Permit Required Confined Space; Permit Space: A confined space which has one or more of the following characteristics:

1. Contains or has the potential to contain a hazardous atmosphere;
2. Contains a material that has the potential to engulf an entrant;
3. Has an internal configuration that could trap or asphyxiate an entrant, such as inwardly converging walls or a floor that slopes downward and tapers to a smaller cross-section; and/or
4. Contains any other recognized serious safety and/or health hazard.

Person Definitions

Attendant: The trained individual stationed outside the permit space who monitors the authorized entrants and who performs all attendant duties.

Entrant: The trained individual who enters the permit space.

Entry Supervisor: The trained individual with the responsibility to:

1. Assure that acceptable entry conditions are present within the permit space under his/her jurisdiction.
2. Issue a permit authorizing entry.
3. Oversee entry operations.
4. Terminate the entry and permit.

Hazard Definitions

Engulfment: The surrounding and effective capture of a person by a liquid or finely divided (flow-able) solid substance that can be aspirated to cause death by filling or plugging the respiratory system, or that can exert force on the body to cause death by strangulation, constriction, or crushing.

Hazardous atmosphere: an atmosphere that may expose employees to the risk of death, incapacitation, impairment of the ability to escape unaided from a permit space, injury, or acute illness. Hazardous atmospheres may be created by conditions such as, but not limited to:

1. Flammable gas, vapors, or mists in excess of ten percent of the lower flammable limit (LFL).
2. Airborne combustible dust at a concentration that:
 - a. Meets or exceeds its LFL.
 - b. Obscures vision at a distance of five feet or less
3. Atmosphere oxygen concentration below 19.5 percent or above 23.5 percent.
4. Atmospheric concentrations at or above the Permissible Limit (PEL) of substances identified in Subpart Z of 29 CFR 1910.
5. Any other atmospheric conditions which are immediately dangerous to life and health.

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 space.

Hazard Control Definitions

Conditions of Entry: The conditions that must exist in a permit space to allow employees to safely enter and perform duties within the space.

Blanking, Binding: Absolute closure of a pipe, line, or duct by fastening a solid plate 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.

Double Block and Bleed: The closure of a line, duct, or pipe by closing and locking/tagging out two in-line valves, and opening and locking/tagging out a drain or vent in the line between the two closed valves.

Inerting: The displacement of the atmosphere in a permit space by a noncombustible gas to such an extent that the resulting atmosphere is noncombustible, producing an IDLH oxygen-deficient atmosphere.

Isolation: The complete removal of a permit space from service and the complete protection of that space from the release of energy or material.

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.

Permit Definitions

Alternate Entry Procedures: The use of continuous forced air ventilation and atmosphere monitoring in lieu of a permit to enter a permit required confined space that:

1. Has an actual or potential hazardous atmosphere that can be demonstrably controlled by continuous forced air ventilation alone.
2. Has no other hazards of any kind.

Emergency: Any occurrence (including the failure of hazard control or monitoring equipment) or event, internal or external to the permit space, which could endanger entrants.

Entry: The action of breaking the plane of an opening of a permit space with any part of the body.

Permit: The written or printed document authorizing entry into a permit space and designating the requirements for entry.

Prohibited Condition: Any condition in a permit space that is not allowed by the permit during the period when entry is authorized.

Testing: The process by which the hazards that may confront entrants are identified and evaluated. This term includes the specification of tests that are to be performed in the permit space.

Responsibilities

Safety and Risk Management

Safety and Risk Management has the primary responsibility for the implementation and enforcement of the CSEP and is responsible for the following:

- Develop the University's written Confined Space Entry Program and update when necessary.
- Provide guidance in the selection of air monitoring equipment, maintenance, field calibration, and training of its use.
- Assist in the evaluation and identification of confined spaces.
- Perform air monitoring or testing of confined space work.
- Develop and assist with conducting confined space training.

Entry Supervisor

Entry Supervisors are responsible for providing the necessary direction and support to ensure the effective implementation of the CSEP for their work areas. Entry supervisors are responsible for the overall permit space entry and must coordinate all entry procedures, tests, permits, and other required duties. Entry Supervisors are also responsible for the following:

- Assure that all employees involved in the work are trained in accordance with 29 CFR 1910.146 Confined Spaces and other requirements.
- Determine if acceptable entry conditions are present at a permit space where the entry is planned.
- Inform Authorized Entrants and Attendants of the potential hazards associated with entering each space.
- Sign-off on entry permit to allow employees to enter the confined space. Verify appropriate entries have been made on the permit, all tests specified by the permit have been conducted and that all procedures and equipment specified by the permit are in place before signing the permit.
- Terminate the entry and cancel the permit when appropriate.
- Coordinate confined space entry operations with contractor should work involve spaces owned or operated by WCU.
- Verify rescue services are available and communication systems are functioning.
- Remove unauthorized persons from work area who enter or attempt to enter the permitted space.

Attendant

At least one attendant is required outside the permit space for the duration of the authorized entry operation. All attendants are required to have completed confined space training before they are allowed to serve as attendants. Attendants are responsible for the following:

- Know the hazards that may be faced during entry of the confined space.
- Perform no other duties beyond stated for Attendants.

- Station themselves outside permit space at the opening to the space, and remain in place throughout the duration of the entry or until relieved by another authorized Attendant.
- Continuously maintain an accurate count of entrants in the permit space and ensure a means to accurately identify authorized entrants.
- Communicate with entrants frequently by voice or communication equipment to ensure all is well or when they need to evacuate.
- Order an immediate evacuation of the space:
 - Upon becoming aware of the development of a sign or symptom of an exposure to a dangerous situation.
 - Upon becoming aware of the development of a condition that could endanger the entrants.
 - If the attendant cannot effectively and safely perform all the attendant responsibilities.
- To summon rescue and other emergency services as soon as the attendant determines entrants need assistance to escape the permit confined space.
- Warn unauthorized persons to stay away from the permit confined space. Do not allow unauthorized persons to enter the permit space. Inform the authorized entrants and the entry supervisor if unauthorized persons have entered the permitted space. Entry supervisor shall remove unauthorized persons from the permitted space.
- Do not perform non-entry rescues as specified by the rescue procedures and the entry supervisor.

Entrant

All entrants must be authorized by the entry supervisor to enter permit spaces, have received the required training, use the proper equipment, and observe the entry procedures and permit. Entrants are responsible for the following:

- Know the hazards that may be encountered during entry.
- Enter the space and perform the assigned work as expediently as possible.
- Communicate with the attendant frequently or upon request to confirm all is well.
- Immediately evacuate the space and alert the attendant or entry supervisor whenever any of the following occurs:
 - The development of a condition that causes a dangerous situation.
 - The development of a sign or symptom of exposure to a dangerous situation.
 - Failure of any required equipment to enter the permitted space.
- Exit the permit space as quickly as possible whenever:
 - Attendant or entry supervisor gives an order to evacuate the permit space.
 - Entrant recognizes any warning sign or symptoms of a dangerous situation.
 - Entrant detects a prohibit condition not in compliance with the permit.
 - Failure of any required equipment to enter the permitted space.

Contractors

Outside contractors may need to enter a permit space to perform work for the university. The Safety and Risk Management Office shall be informed when a contractor will be entering a WCU permitted confined space.

- Contractors shall be informed that the space is a permit-required confined space and known hazards within the space.
- Contractors must follow WCU Confined Space Entry Program per OSHA Standard 29 CFR 1910.146 and use an authorized permit for entry.

- Require the contractor to eliminate any temporary hazards created by the work, or notify the supervisor

Contractors are responsible for the following:

- Obtain and use the available information provided.
- The entry supervisor shall notify any employees near or affected by entry.
- If employees shall enter the space with contractor employees, the entry supervisor shall ensure that entry operations are coordinated with the contractor or designee to assure that
 - All entrants of both employees can be accounted for during the entry.
 - The work of one employer does not endanger the employees of the second employer.
 - There is an attendant in place whenever employees of either employer have entered the space.
- Debrief the contractor at the conclusion of the entry regarding the permit space program followed and any hazards confronted or created in the space during work.

Permit Required Confined Spaces (PRCS)

The University has identified known permit required confined spaces. Please note that WCU does not allow the use of alternate procedures during permit space entry. Entry Supervisors are required to complete an entry permit for every permit required confined space and have the permit onsite for the duration of the entry. The following are examples of permit required confined spaces on campus:

Permit required:

- Manholes
- Tanks
- Boilers
- Tunnels

Non-permit Required Confined Spaces (NRCS)

Non-permit required confined spaces do not contain additional hazards such as the potential of a hazardous atmosphere or the potential for workers to become engulfed or trapped by materials. Entry into confined spaces that do not require a permit should be made with caution. The following are examples of non-permit confined spaces on campus:

Potentially Non-permit required:

- Attics
- Crawlspace
- Plenums
- Mechanical rooms

Note: *The locations of permit-required and non-permit required confined spaces are continuously under review.*

Changes in Space Use or Configuration

When there are changes in the use and configuration of a non-permit confined space that might increase the hazards to entrants, the space is reevaluated and, if necessary, reclassified as a permit-required confined space. Any changes to a confined space should be communicated to the Safety and Risk Management Office.

Confined Space Reclassification

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

If it is necessary to enter the permit space to eliminate hazards, such entry shall be performed according to confined space entry procedures. If testing and inspection during that entry demonstrate that the hazards within the permit space have been eliminated, the permit space may be reclassified as a non-permit confined space as long as the hazards remain eliminated.

A certification is documented showing the hazards were eliminated. See Appendix B. If the hazards arise within a permit space that has been declassified to a non-permit space, each employee must exit the space and the space is reevaluated to determine if it must be reclassified as a permit space.

Note: *Control of the atmospheric hazards through forced air ventilation does not constitute elimination of the hazards.*

Confined Space Requirements

The Safety and Risk Management Office and department supervisors shall perform a workplace risk assessment to identify confined spaces, the hazards in or around the spaces, and the potential for hazards to develop in or around the spaces. The assessment shall identify all known permit required confined spaces (PRCS's), along with all energy sources, moving equipment, and pipe inlets which must be controlled before entering the space.

Confined Space Hazards

Each supervisor shall evaluate the hazards of a confined space before allowing employees to enter. Supervisors shall identify the following, but not limited to, if present:

Atmospheric Hazards: oxygen depleted, toxic gases, or explosive

Physical Hazards: slip trip or fall, falling objects, moving parts of equipment or machinery, electrical shock, temperature extremes, crushing, pinching, or excessive noise

Precautions must be taken to prevent creating hazardous, toxic, or explosive atmospheres while employees are within a confined space. The types of materials used while working in a confined space must be thoroughly evaluated. Testing the atmosphere inside the confined space is necessary before entering and during the time when work is being performed. The use of toxic or flammable chemicals or materials can change the atmospheric condition of a confined space after initial testing. When an atmosphere is changed, it can create a dangerous environment.

Examples of work which can create a potentially dangerous atmosphere:

- Using chemical products (painting, cleaning with solvents, applying adhesives, etc.)
- Hot work
- Mixing of incompatible chemicals

Identify Confined Spaces

Each confined space listed shall be designated as a non-permit or permit required space. The hazards of each permit required space shall be catalogued on the list. WCU supervisors are encouraged to contact the Safety and Risk Management Office for assistance with classifying confined spaces. Confined spaces shall be considered hazardous until an evaluation is completed.

Departments shall notify Safety and Risk Management if additional confined spaces are identified or if new ones are installed or created. For each newly identified space, a “Confined Space Hazard Evaluation Form” must be completed and sent to the Safety Office.

Safety and Risk Management will maintain a campus-wide list of known permit required confined spaces. The list shall be available to all supervisors and employees. See Appendix A for a list of known PRCS’s.

Elevator mechanical Spaces

Elevator mechanical spaces at WCU are generally considered confined spaces, but are not generally considered permit required confined spaces.

If a hazardous or potentially hazardous atmosphere exists (e.g. a chemical leak, spill, or welding) within or in close proximity to an elevator pit, the pit will be reclassified as a permit-required confined space for the duration of the event. Employees who enter the pit under these circumstances must perform operations in accordance with WCU Confined Space Entry Program

Acceptable Entry Conditions

Before a permit space that may have a hazardous atmosphere can be entered, the atmosphere must be tested using the steps identified on the permit (developed during evaluation testing). Verification testing is done to make sure that the chemical hazards that may be present are below the levels necessary for safe entry, and that they meet the conditions identified on the permit. Test the atmosphere in the following order: (1) for oxygen, (2) for combustible gases, and then (3) for toxic gases and vapors. The testing results, the actual test concentrations, must be recorded on the permit near the levels identified for safe entry.

The atmosphere will be considered unacceptable if the following conditions are present:

- oxygen level is below 19.5%
- oxygen level above 23.5%
- flammable gas levels exceed 10% of the Lower Flammable Limit (LEL)
- carbon monoxide levels above 25 ppm
- hydrogen sulfide (H₂s) above 10 ppm
- Sulfur Dioxide (SO₂) above 2 ppm

Before an employee enters the space, the internal atmosphere shall be tested, with a calibrated direct-reading instrument. Any employee who enters the space shall be provided an opportunity to observe the pre-entry testing. The atmosphere within the space shall be periodically tested as necessary to ensure the space is maintained within the limits of the acceptable entry conditions per OSHA standards.

Isolating the Permit Space

All hazardous energy sources associated with permit spaces which may expose entrants to potential injury are isolated, locked out and/or tagged out prior to entry:

- A. Purging, Inerting, Flushing, or Ventilating Permit Spaces: All permit entry spaces are thoroughly purged, inerted, flushed, and ventilated as necessary to ensure the elimination and/or control of all hazards which may cause entrant injury and/or illness.
- B. External Hazards: Pedestrian, vehicle, or other barriers are provided as necessary to protect entrants from external hazards.

- C. Verifying Acceptable Conditions: Conditions in permit spaces are tested and monitored throughout entry as necessary to ensure that they are acceptable for the duration of the authorized entry.

Confined Space Atmospheric Testing

Atmospheric testing is necessary to evaluate airborne hazards present in the permit space, and to verify that acceptable entry conditions are present.

Evaluation

Initial evaluation of the atmosphere of a confined space should be analyzed with a Safety Office approved instrument that is sensitive enough and designed to evaluate any hazardous atmospheres that may exist or arise. The results of the atmospheric testing will have a direct impact on the:

- Development of the entry procedure,
- Selection of PPE,
- Duration of worker exposure, or
- Whether an entry will be made at all.

The Safety office should be called for assistance with the evaluation and interpretation of the data, and the development of the entry procedure.

Verification

Prior to entry, a PRCS which may contain a hazardous atmosphere shall be tested for residues of all contaminants identified by the evaluation testing using an instrument specified in the entry permit. Results of testing shall be recorded on the entry permit and compared to the acceptable entry conditions. If testing reveals oxygen deficiency or the presence of toxic gases or vapors, the space must be ventilated or purged and retested before entry. The atmosphere shall be tested continuously during entry operations.

Measurement Duration

The measurement of each atmospheric parameter shall be made for at least the minimum response time of the test instrument specified by the manufacturer.

Stratified Atmospheres

The density of gases and vapors will cause them to be:

- Heavier than air, and settle to the bottom of a space, (hydrogen sulfide),
- Lighter than air, and concentrate at the top of the space, (methane), or
- The same as air, and accumulate in the center, (carbon monoxide).

When monitoring for entries involving a descent into atmospheres that may be stratified, the space should be tested every four feet (4 ft.) in the direction of travel and to each side. The entrant's rate of progress should be slowed to allow for sampling and detector response.

Testing Procedures

1. Contact the Safety and Risk Management or responsible designee to act as air monitor that has completed confined space training as well as training in the proper use of the monitoring equipment.

2. Use a Multi-Gas Monitor that has been calibrated within the past month and bump tested on the day of use. A copy of the manufacturer's operating instructions shall accompany the equipment.
3. In a clean atmosphere, perform equipment check-out procedure or operational check as stated in the operating instructions.
4. If possible, draw an air sample through a hole leading to the space before opening the entry port. Otherwise, open the entry port and start sampling every 4 feet in the direction of travel and from side to side. It is recommended that the sampling time be twice (2 x) the response time of the equipment.
5. Test atmosphere parameters in the following order: 1. Oxygen 2. Flammability 3. Toxic
Compare sampling results to the following acceptable entry conditions:
 - oxygen level is below 19.5%
 - oxygen level above 23.5%
 - flammable gas levels exceed 10% of the Lower Flammable Limit (LEL)
 - carbon monoxide levels above 25 ppm
 - hydrogen sulfide (H₂S) above 10 ppm
 - Sulfur Dioxide (SO₂) above 2 ppm
6. Record sampling results on the entry form.
7. It is recommended that the following readings be taken:
 - Before ventilation
 - After ventilation
 - Initial entry survey
8. Contact the Safety and Risk Management should there be issues with atmosphere testing.

Equipment Required

The following equipment should be included, but not limited to:

- Air monitoring equipment (Oxygen, Lower Explosive Limit (LEL), Carbon Monoxide (CO), Hydrogen Sulfide (H₂S) at a minimum.
- Communication equipment
- Barriers and shields
- Ingress and egress equipment
- Personal Protective Equipment
- Manhole hook
- Forced air ventilating equipment
- Lighting equipment
- Traffic control equipment
- Fire Extinguisher
- First Aid Kit

Additional equipment required for PRCS entries:

- Rescue body harness
- Retrieval life line
- Retrieval tripod with personal wrench

- Personal air monitoring equipment

Note: All equipment shall be maintained and supervisors shall ensure that employees use the equipment properly.

Confined Space Entry Procedures

Preparation

- Determine if entry into the space is necessary.
- Identify possible hazards and control measures.
- Perform initial atmospheric testing.
- Determine if work to be carried out could create a hazard in the space.
- Determine which Entry Level is required. (Non-permit or Permit Required).
- Identify equipment and PPE needed for entry.
- Document entry plan by completing a Confined Space Entry Permit.
- Assemble all equipment.
- Erect barriers around opening if necessary.
- Provide traffic control if necessary.

Non-permit Confined Spaces

Persons desiring to enter a non-permit confined space shall:

1. Inform their immediate supervisors of the confined space location and plans for entry.
2. Never work alone. Provide at least one attendant for the duration of the entry operations.
3. Have a means to summon assistance (cell phones, two-way radio, etc.).
4. Guard or barricade entry opening to protect the safety of personnel, pedestrians and motorists, if necessary.
5. Test the atmosphere prior to entry with a calibrated, direct reading instrument for a hazardous atmosphere.
6. Record air monitoring results on the Confined Space Entry Permit.
7. If a hazardous atmosphere is detected, the space must not be entered and the immediate supervisor must be informed as soon as possible.
8. Evaluate the space for engulfment, entrapment or any other serious safety or health hazards. If any of these hazards are found, this space must not be entered and a supervisor must be informed as soon as possible.
9. Wear all required personal protective equipment (PPE) for the assigned task.
10. Be observant of the effects of hazardous contaminants and evacuate if any are detected.
11. When work is completed, return the space to original condition.

Permit Required Spaces

1. Survey the confined space without entry and review the work to be performed. Identify any existing or potential hazards.
2. Determine if the work being performed will create a hazard in the confined space.
3. Eliminate the physical hazards, if possible by:
 - Lock out / tag out all sources of energy (steam, electrical, mechanical)
 - Blanking and bleeding off pneumatic and hydraulic lines
 - Clean and/or purge any chemical storage vessel
 - Securing mechanically moving parts
4. Assign all entry team members a specific role to serve with instructions.
5. Determine communication between attendants and entrants.

6. Perform initial atmospheric testing.
7. Ventilate the space for a minimum of 5 minutes.
8. Resample atmospheric conditions. Confirm that acceptable entry conditions are present. If conditions are not acceptable, entry is not allowed.
9. Continually ventilate the space by pushing air so that a positive pressure changes the atmosphere over several times every hour.
10. The atmosphere within the space shall be periodically tested as necessary to ensure that the continuous forced air ventilation is preventing the accumulation of a hazardous atmosphere.
11. Prior to entry into a confined space, an entry permit form shall be completed.
12. Identify required equipment and PPE for entry.
13. Assemble all equipment that is required for entry.
14. Erect barriers around opening, if necessary.
15. Provide Traffic control, if necessary.
16. Enter space and check for hazards that may not have been detected.
17. Under the following conditions, entrants must exit the confined space, re-evaluate hazards and modify entry procedures:
 - A hazardous atmosphere is detected after entry.
 - If any health or safety hazards develops which was not anticipated.
 - The attendant cannot effectively perform their duties.
 - The entrants are experiencing symptoms from heat stress or over exposure to atmospheric conditions.
18. When work is completed, return the space to original condition.

Note: Permits issued under the procedures in this program shall be limited in duration to no longer than eight hours.

Rescue and Emergency Services

Under no circumstances shall unauthorized personnel enter a confined space to attempt a rescue. At the present time there are no university employees authorized to perform a confined space rescue.

Offsite Emergency Services

The Cullowhee Voluntary Fire Department will be dispatched to provide assistance on confined space rescue. Jackson County Emergency Medical Services (EMS) is responsible for providing emergency medical treatment.

In case of an emergency, contact WCU Emergency Services by one of the following methods:

- Campus: 828-227-8911
- Campus: 911
- Radio: call Facilities Management base station and declare an emergency and assistance is needed

Non-Entry Rescue

To facilitate non-entry rescue, retrieval systems or methods shall be used whenever an authorized entrant enters a permit space, unless the retrieval equipment would increase the overall risk of entry or would not contribute to the rescue of the entrant.

- Each entrant shall use a body harness with a retrieval line attached. The other end of the retrieval line shall be attached to a mechanical device for any vertical permit-required space more than 5 feet deep.

- Wristlets are only used when a full body harness has been demonstrated infeasible or creates a greater hazard and wristlet use is the safest and most effective alternative.
- Retrieval lines are attached to a mechanical device or fixed point outside the space so rescue can begin immediately after the rescuer becomes aware that rescue is necessary.
- Mechanical devices are available to retrieve entrants from vertical type permit spaces more than 5 feet deep.
- If an entrant is exposed to a substance that is required to have a Safety Data Sheet (SDS), that information shall be given to the EMS personnel treating the entrant.

Training

All entry supervisors, attendants, entrants are properly trained initially and refresher training is provided when duties and space hazards change or whenever an evaluation determines inadequacies in the employee's knowledge.

The supervisor shall provide training so that all employees whose work is regulated by this program with the necessary understanding, knowledge, and skills to safely enter, work in, and exit from permitted spaces.

Requirements

Specific training shall be provided to each affected employee:

- Before the employee is first assigned duties.
- Before there is a change in assigned duties.
- Whenever there is a change in permit space operations that presents a hazard about which an employee has not previously been trained.
- Whenever the supervisor has reason to believe either that there are deviations from the permit space entry procedures or that there are inadequacies in the employee's knowledge or use of these procedures.

The training shall establish employee proficiency in the required duties and shall establish new or revised procedures, as necessary, for compliance with this program.

The supervisor shall certify that the training required has been accomplished. The certification shall contain each employee's name, signatures or initials of the trainers, and training dates. The training certification is available for inspection by employees and their authorized representatives.

Appendix A: Identified Confined Spaces

Western Carolina University Confined Space Policy Appendices

Identified Confined Spaces:

Confined Spaces	Permit Required
Attics	No
Boilers	Yes
Crawlspaces	No
Ductwork / AHU (with hot work)	Yes
Ductwork / AHU	No
Electrical Vaults	Yes
Electrical Manhole	Yes
Elevator Sump Pits	No
Excavations	No
Lift Stations (Water Plant)	Yes
Manholes (Steam)	Yes
Manholes (Sanitary Sewer)	Yes
Pump Station vault (Water Plant)	Yes
Quad Fountain Vault	No
Tanks	Yes
Telcom Vaults	Yes
Tunnel (Steam)	Yes

Attachment B: Reclassifying Confined Space Form

Western Carolina University Reclassifying Confined Spaces

A permit-required space may be reclassified as a non-permit-required confined space when (a) the space poses no actual or potential atmospheric hazards, and (b) all hazards within the space are eliminated without entry into the space. This reclassification is only valid as long as the space remains hazard free. If hazards arise within a non-permit-required confined space, employees in the space must exit immediately and the space must be re-evaluated.

Confined Space Identification & Location:			
Purpose of Entry:			
Authorized Duration of Permit:	Start Date:	Expire Date:	
	Start Time:	Expire Time:	

Pre-Entry Hazard Elimination Measures Taken

	Yes	No	NA
1. Contents of the space removed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Exposed electrical de-energized and verified	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Lockout, tag-out and tryout procedures implemented	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. All slip hazards eliminated	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Space poses no actual or potential atmospheric hazards; or if there are potential atmospheric hazards, testing (oxygen, flammable vapors/gases and toxic concentrations) has been conducted and documented	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Passageway and access opening obstruction hazards eliminated	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Sharp edges removed or guarded	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Physical barriers or barricades installed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Additional Hazard Elimination Measure Taken

Steps Necessary to Identify Hazards That Develop During Entry

Atmospheric Monitoring Results (If testing required for potential atmospheric hazards)

Agent	Limit	Test Results	Test Time	Tester's Initials
Oxygen	19.5% - 23.5%			
Flammables	< 10%			
H ₂ S	< 10 ppm			
CO	< 25 ppm			

I certify that all identified hazards have been eliminated, that the confined space is safe to enter, and hereby reclassify the confined space as a non-permit-required confined space.

Print: _____ Sign: _____ Date: _____

Appendix C: Confined Space Permit

Western Carolina University Confined Space Entry Check List and Permit

Scope: This checklist must be completed before entering any confined space. A confined space is defined as any area that

- has limited or restricted means of entry or exit;
- is large enough for a person to enter to perform tasks;
- is not designed or configured for continuous occupancy; and
- has the potential for a significant hazard to be present.

Space to be entered: _____ Name of entry supervisor: _____

Permit start date/time: _____ Expires date/time: _____

Purpose of entry/Work to be performed: _____

Preparation for entry (See written procedure for requirements)

Entrants, attendants, supervisor, contractors - all trained in confined space safety.	Done	NR
All have reviewed and understand entry procedure, especially anticipated hazards, acceptable entry conditions, emergency procedures. Street work rules being followed if required. Space barricaded.	Done	NR
Means to summon rescue: Dial 911 or 227-8911 for Campus Emergency Services. Radio 303 or 306 for Safety Office.	Done	NR
PPE/Respiratory protection to be worn (circle): Gloves Glasses Boots Safety Harness/Lifeline Other: _____	Done	NR
All moving parts, augers, etc. are locked and tagged out. Electrical/ground fault hazards have been identified and locked out.	Done	NR
Flow of incoming material, including gases, <u>positively</u> controlled (i.e. pumps locked out, feedlines disconnected or blanked). Steam valves are not to be shut off from inside confined spaces.	Done	NR
Mechanical ventilation running prior to entry and continuously throughout	Done	NR
Hot Work Permit completed and appropriate fire extinguisher provided	Done	NR
Material Safety Data Sheet provided	Done	NR
Any other entry requirements (describe):	Done	NR

NR – Not required by procedure

Initial pre-entry atmospheric check *Person performing check signature:*

	Readings	Acceptable
Instrument(s) used: MSA Altair 5X, Serial#: 00021746	Oxygen (O ₂):	19.5%-23.5%
Bump Test Performed: <input type="checkbox"/> Yes <input type="checkbox"/> No	Hydrogen Sulfide (H ₂ S):	<10 ppm
Calibrated:	Carbon Monoxide (CO):	<25 ppm
Calibration gas: Econo-Cal Calibration Check Gas, Part# 10098855, Serial#: 947622	Sulfur Dioxide (SO ₂):	<2 ppm
	Lower Explosive Limit (LEL):	<10%

Note: If any of the gases above are not in the acceptable range the confined space is not to be entered.

Supervisor/Competent Person Authorization:

I have reviewed the relevant confined space entry procedure and verified that all necessary steps to prepare for entry have been taken. Permit will be terminated when work is complete or in the case that a hazard arises. I authorize this work to begin at this point.

Entry supervisor: _____ Date/Time: _____

Roster of entrants(s) authorized to enter space

Roster of responsible attendants
