

Confined Space Entry

1) Introduction

- A) According to a report released by the federal government, an average of 60 deaths and 12,000 injuries occur each year as a result of improper confined space entry with approximately 25% of those deaths and injuries resulting to a would-be rescuer.
- B) The United States Department of Labor – Occupational Safety and Health Administration (OSHA) has established regulatory standards for the entry into a confined space. These standards are enforced by the US Department of Labor or the South Carolina Department of Labor, Licensing and Regulation – Occupational Safety and Health Administration (SC OSHA).
- C) This standard is a result of several years of researching accident reports and other available information and holding public hearings on confined space entry. OSHA's findings were as follows:
 - I) There is a significant risk to workers who enter confined spaces.
 - II) Accident reports show a significant annual toll of deaths and injuries resulting directly from confined space entry. Because of the number of workers exposed to these hazards, OSHA believes the risk to be excessive.
 - III) Risks associated with confined spaces include death, injury, permanent impairment, and loss of functional capacity. Most confined space injuries and deaths result from asphyxiation due to hazardous atmospheres.
 - IV) Many employers do not adequately protect their workers despite repeated safety warnings.
 - V) Most confined space deaths and injuries occur because employees are unaware of hazards and are poorly equipped to manage resulting situations.
- D) By definition, a confined space is a space that:
 - I) Has a size and shape that would allow a person to bodily enter it and perform work. (Note: Small machine enclosures or inspection portals do not qualify as confined spaces.)
 - II) Has limited or restricted openings that would make it difficult for a person to enter or exit.
 - III) Is not designed for continuous human occupancy. (Note: Those entered infrequently for inspection, maintenance, cleaning or repair.)
- E) A permit-required confined space is a confined space that has one or more of the following characteristics:
 - I) Contains or has the potential to contain hazardous atmospheres.
 - II) Contains a material that has the potential for engulfing an entrant.
 - III) Has an internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls or by a floor which is sloped downward and tapers to a small cross-section.
 - IV) Contains any other recognized serious safety or health hazard.
- F) All confined spaces are considered to be permit-required until re-classified otherwise. To eliminate any ambiguity, all confined spaces within the Electric City Utilities water distribution system will be considered permit-required, and entry into any permit-required confined space will be conducted ONLY if safe entry conditions exist.

2) Audience

- I) The Confined Space Entry Policy is to be strictly adhered to by all Electric City Utilities Water Operations personnel.

3) Basis

- A) This policy requires all employees and supervisors to follow all regulations and standards established by Code of Federal Regulation Title 29 (Labor) Part 1910 (Occupational Safety and Health Standards) Subpart J (General Environmental Controls) Standard Number 146 and all other applicable local, state and federal laws and regulations.

4) Training

- A) Employees and supervisors are expected to be trained and certified within the first six months of employment in a certified training course. If training is not available within the first six months of employment then the employee / supervisor is expected to attend the first available class and receive a certificate of completion. A copy of the certificate or class participation document will be kept by the individual's supervisor. Failure to complete the training within a reasonable timeframe may result in termination of employment or reassignment of job duties.
- B) Recertification for training or the taking of "refresher courses" shall be conducted as required by City policy, South Carolina regulations, or Federal law. Annual refresher training will be conducted at scheduled safety meetings to reinforce previous training and introduce new or revised procedures.
- C) Confined space entry team members shall be trained in all safety precautions as well as specific duties of entrant, attendant, or entry supervisor.
- D) Training is to be provided under the following circumstances:
 - I) Before the employee is first assigned confined space permit duties.
 - II) Before there is a change in assigned duties.
 - III) Whenever a change in permit space operations presents a hazard for which the employee has not been trained.
 - IV) Whenever the employer believes there are deviations from acceptable permit space procedures or that there are inadequacies in employee knowledge.
- E) Following is a list of training topics that should be covered:
 - I) Explanation of permit-required space hazards.
 - II) Discussion of specific hazards of Electric City Utilities facilities.
 - III) Proper use of personal protective equipment (PPE) and other safety equipment.
 - IV) Explanation of City permit system and other procedural requirements.
 - V) How to respond to emergencies.
 - VI) Duties and responsibilities of each member of the permit-required confined space team.
 - VII) How to recognize air contamination exposure to themselves and co-workers.
 - VIII) Methods for alerting the attendant.
- F) Training programs must establish employee proficiency in required duties documenting that employees are trained and have the understanding, knowledge, and skills necessary for safe entry, work, and exit. Training documents must record each employee's social security number, the signatures or initials of the trainer, the dates of training and the duties for which the employee was trained.
- G) If an employee feels that he/she needs to be retrained on the requirements then it should be the job of the supervisor to seek out the appropriate training class(es) for the individual.

5) Enforcement

- A) This policy may be enforced by any of the following:
 - I) Fellow employee,
 - II) Supervisor,
 - III) Department or Division Manager,
 - IV) City Risk Assessment Official or Safety Supervisor,
 - V) City of Anderson Fire Department,
 - VI) SC Labor, Licensing, and Regulation – SC OSHA, and
 - VII) US Department of Labor – OSHA
- B) It is expected that all trained persons at the work site constantly evaluate all situations and serve to remind or enforce all Confined Space Entry Policy requirements. If there is a potential safety issue then the operation can be stopped by anyone (supervisor, entrant, attendant, manager, etc.) with no repercussions from the employer (protection granted by federal law).

6) Penalties for Noncompliance by Personnel

- A) The following consequences may result for noncompliance with the local, state and federal laws and regulations and/or this policy:
 - I) Verbal reprimand,
 - II) Removal from site / job duties,
 - III) Written reprimand,
 - IV) Dismissal from duties for work day,
 - V) Reassignment of job duties, or
 - VI) Termination of employment.
- B) All penalties will be in compliance with the City of Anderson Employee Handbook and with the assistance of the City of Anderson Personnel Department, Utilities Division Manager, Water Operations Manager, and/or Supervisor.

7) Laws and Regulations

- A) Applicable laws and regulations can be found in the current version of 29 CFR 1910.146 or with SC OSHA. Questions regarding laws and regulations should be directed to employee supervisor. It is the responsibility of the supervisor to get a question or concern answered prior to placing the employee in any situation that risks the health or life of an employee.

8) Preventing Unauthorized Entry

- A) Employees not involved in confined space entry will also be made aware of confined space hazards and not allowed to enter any confined space. Awareness and performance training shall be appropriately documented.
- B) All confined spaces in the Electric City Utilities system shall be posted with appropriate warning signs. Warning signs will notify employees and/or visitors of potential hazards and prohibit non-authorized entry. No employee shall enter a posted space unless they have proper training and follow specific entry guidelines.
- C) Barriers, locks, or covers or other appropriate means of preventing unauthorized entry will be used as required. Confined spaces will be visually inspected to verify that required notification and other safety measures are in place. This may be done by either the Water Operations or Water Administration departments.

9) Reasons for Entry

- A) The following are reasons that personnel must occasionally enter a confined space:
 - I) Read or repair meter
 - II) Replace or repair valves
 - III) Test or inspect cross connection control prevention devices
 - IV) Repair or adjust altitude valve
 - V) Replace altitude valve

10) Designation of Confined Space Personnel

- A) Affected employees shall be designated as authorized entrants, attendants, and/or entry supervisors. The duties and responsibilities of each designation are as follows:
- B) An entrant must:
 - I) Know the hazards that may be faced during entry, including information on the mode, signs or symptoms, and the consequences of the exposure.
 - II) Know the proper use of the required equipment.
 - III) Communicate with the attendant as necessary to enable the attendant to monitor entrant status and to enable the attendant to alert entrants of the need to evacuate the space if required.

- IV) Alert the attendant whenever;
 - V) The entrant recognizes any warning sign or symptom of exposure to a dangerous situation;
 - VI) The entrant detects a prohibited condition.
 - VII) Exit from the permit space as quickly as possible whenever:
 - (1) An order to evacuate is given by the attendant or the entry supervisor;
 - (2) The entrant recognizes any warning sign or symptom of exposure to a dangerous situation;
 - (3) The entrant detects a prohibited condition;
 - (4) An evacuation alarm is sounded.
- C) An **attendant** must:
- I) Know the hazards that may be faced during entry, including information on the mode, signs or symptoms, and consequences of the exposure.
 - II) Be aware of the possible behavioral effects of hazard exposure in authorized entrants.
 - III) Continuously maintain an accurate count of authorized entrants in the permit space and ensure that the means used to identify the authorized entrants accurately identifies who is in the permit space.
 - IV) Remain outside the permit space during entry operations until relieved by another attendant.
 - V) Communicate with authorized entrants as necessary to monitor entrant status and to alert entrants of the need to evacuate when necessary.
 - (1) Monitor activities inside and outside the space to determine if it is safe for entrants to remain in the space and order the authorized entrants to evacuate the permit space immediately under any of the following conditions:
 - (a) If the attendant detects a prohibited condition;
 - (b) If the attendant detects the behavioral effects of hazard exposure in an authorized entrant;
 - (c) If the attendant detects a situation outside the space that could endanger the authorized entrants;
 - (d) If the attendant cannot effectively and safely perform all the duties required.
 - (2) Summon emergency rescue services as soon as the attendant determines that authorized entrants may need assistance to escape from permit space hazards.
 - (3) Take the following actions when unauthorized persons approach or enter a permit space while entry is underway:
 - (a) Warn the unauthorized persons that they must stay away from the permit space;
 - (4) Advise the unauthorized persons that they must exit immediately if they have entered the permit space;
 - (5) Inform the authorized entrants and the entry supervisor if unauthorized persons have entered the permit space.
 - VI) Perform non-entry rescue as specified by the entry supervisor.
 - VII) Perform no duties that might interfere with the attendant's primary duty to monitor and protect the authorized entrants.
- D) An **entry supervisor** must:
- I) Know the hazards that may be faced during entry, including information on the mode, signs or symptoms, and consequences of the exposure.
 - II) Verify, by checking that the appropriate entries have been made on the permit, that all tests specified by the permit have been conducted and that all procedures and equipment specified by the permit are in place before endorsing the permit and allowing the entry to begin.
 - III) Terminate the entry and cancel the permit as required by the permit entry procedure.
 - IV) Prevent unauthorized individuals from entering the permit space during entry operations.
 - V) Determine that entry operations remain consistent with the terms of the entry permit and that acceptable entry conditions are maintained. This determination must be made each time

responsibility for a permit space entry operation is transferred and at intervals dictated by the hazards and operations performed within the space.

11) Required Equipment

- A) The Electric City Utilities will provide all equipment necessary for confined space entry, maintain the equipment, and ensure that employees are properly trained to use the equipment.
- B) Generally, the identified hazards in the confined space will dictate the specific types of equipment to be used. This equipment may include:
 - I) Atmospheric testing and monitoring before and during entry.
 - II) Ventilation to achieve and maintain acceptable entry conditions.
 - III) Communications to maintain contact with entrants or to summon rescue services.
 - IV) Personal protective equipment, when engineering controls and work practices do not adequately protect employees.
 - V) Lighting needed for employees to see well enough to work safely and to exit the space quickly in an emergency.
 - VI) Barriers and shields to protect entrants and exclude bystanders.
 - VII) Safe entry and exit of permit spaces (for example, ladders).
 - VIII) Any other equipment necessary for safe entry into and rescue from permit spaces.
- C) Entry must not take place if all required equipment is not on hand and workable. Should any item of equipment malfunction, entry must be terminated immediately. Entry is not allowed to resume until all necessary equipment is on hand and working properly.

12) Entry Permit

- A) The Electric City Utilities Confined Space Entry Permit and Alternate Entry Form for Confined Space Entry records compliance with the OSHA Standard and authorizes entry into the confined space. Permits must be made available to all entrants at the time of entry and will extend only during the duration of the task. At the completion of the entry operation any complications shall be noted on the permit. If no complications were encountered, then a notation to this fact shall be made.
- B) A copy of the Permit or Form shall be maintained for a period of no less than one (1) year. Permits shall be reviewed annually to assess the Confined Space Entry Program.
- C) A sample Electric City Utilities Confined Space Entry Permit and Alternate Entry Form for Confined Space can be seen at the end of the procedures list.

13) Confined Space Entry

- A) Permit space conditions must be evaluated as follows when entry operations are conducted:
 - I) Confined Space Entry Permit or Alternate Entry Form for Confined Space Entry will be initiated. Alternate Entry for a confined space may only occur if the following conditions are met:
 - II) The *employer* can demonstrate that the only hazard posed by the permit space is an actual or potential hazardous atmosphere;
 - III) The *employer* can demonstrate that continuous forced air ventilation alone is sufficient to maintain that permit space safe for entry;
 - IV) The *employer* develops monitoring and inspection data that supports the demonstrations required stated above.
- B) Conditions in the permit space must be tested to determine if acceptable entry conditions exist before entry is begun. If entry is authorized, conditions shall be continuously monitored in the permit space while entrants are working. For Alternate Entry, activate forced air ventilation and run for at least five (5) minutes or for length of time stated on manufacturer's air flow chart.
- C) Gas monitor readings should be taken near the bottom, middle, and top of the air profile within the confined space. This is to be done by lowering the gas monitor slowly for eight (8) minutes while

recording readings on the proper form. This is required because there could be multiple hazards that stratify within the confined space profile. Safe entry conditions are as follows:

- I) Oxygen content not less than 19.5% (oxygen deficient) or greater than 23.5% (oxygen enriched);
 - II) Less than 10% of the LEL (Lower Explosive Limit) of a flammable gas;
 - III) Any reading greater than 0 PPM (parts per million) of a toxic substance such as carbon monoxide or hydrogen sulfide;
 - IV) Absence of other hazards (chemical, mechanical, engulfment, etc.)
- D) Atmospheric testing is to be done in the following order:
- I) Oxygen
 - II) Combustible gases
 - III) Toxic gases
- E) To facilitate non-entry rescue, each authorized entrant shall use a full-body harness, with a retrieval line attached at the center of the entrant's back near shoulder level. The other end of the retrieval shall be attached to a tripod with winch or fixed point outside the permit space. A tripod with winch shall be available to retrieve personnel from a vertical type permit space more than five (5) feet deep.

14) Rescue and Emergency Services

- A) The City of Anderson Fire Department will be called for any required confined space entry rescue. Under no circumstances will unauthorized City personnel be allowed to attempt entry type rescue operations.
- B) If there is an emergency then anyone at the scene shall dial 911 immediately.
- C) Locations that have confined spaces shall communicate the hazards of the space with the Anderson Fire Department and provide them with access to the confined space so that necessary rescue plans may be developed. A completed Confined Space Entry Permit will be provided to the rescue services upon arrival at the site of the emergency.
- D) When a permit space entry is going to be initiated, the appropriate base station shall be notified that a space is to be entered. Pertinent information such as location, potential hazards, and duration of the entry must be communicated at this time.

15) Contractor Awareness Requirements

- A) When the Electric City Utilities arranges to have employees of another employer (contractor) perform work that involves permit-required confined space entry, the following procedures shall be followed:
 - I) The contractor shall be informed that the workplace contains permit spaces and that entry is allowed only through compliance with the Electric City Utilities Permit-Required Confined Space Entry Program or other program that meets 29 CFR 1910.146 standards.
 - II) Inform the contractor of the elements that make each space a permit-required space, including particular hazards previously identified.
 - III) At the conclusion of the entry, the contractor shall be de-briefed regarding the permit space program followed and hazards confronted or created.

16) Confined Space Permit Procedure

- A) Due to atmospheric and physical hazards that are or could be present in confined spaces, the following procedures will be implemented immediately.
- B) Before Electric City Utilities employees are authorized to enter or work in a confined space, they shall have successfully completed the Electric City Utilities Permit Required Confined Space training and have satisfactorily demonstrated to their immediate supervisor all necessary skills associated with any confined space work.

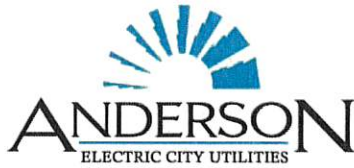
- C) All permit required confined spaces located on company property that are not manholes or pits will have obvious signs posted outside that communicate the status of that space, for example: "Permit Required Confined Space"
- D) First line managers (entry supervisors) shall issue and sign permits for permit required confined spaces and shall document any known or suspected hazard and the conditions/operations necessary to eliminate or protect against said hazards.
- E) Entry, attendant, and in-house rescue employees shall be designated on the permits.
- F) The entry supervisor shall make every attempt to list all conditions, procedures, and safeguards necessary to identify, eliminate, and protect against hazards before entry is authorized.
- G) All conditions, procedures, and instructions that are identified by the entry supervisor on the permit shall be adhered to.
- H) If a hazard or condition which was not addressed on the entry permit is detected or suspected, employees shall not be allowed to enter the space until the entry supervisor is notified and the hazard has been eliminated or protected against. Employees must exit the confined space if a hazard is identified after entry and notify the entry supervisor at once.
- I) Designated employees shall document all tests, observations and conditions on the entry permit.
- J) All cancelled permits shall be signed and returned to the entry supervisor and retained for a minimum of one (1) year and/or until the Electric City Utilities yearly review of confined space permits is completed.

17) Other Specific Requirements

- A) Beyond all applicable current laws and regulations, the following requirements and knowledge must be known and followed by employees and supervisors:
 - I) Meter pits and manholes are considered confined spaces.
 - II) Anytime an employee is in a confined space and is lower than the top of ground level then an approved hard hat must be worn at all times.
 - III) Other hazards may be present and all precautionary measures should be taken to prevent or reduce the risk associated with confined space entry.
 - IV) If multiple different departments are entering a permit-required confined space then all departments are required to completely fill out the permit.
 - V) Do not have a vehicle or combustible engine of any type operating adjacent to the confined space prior to or during entry.
 - VI) Air monitors must be calibrated before each use and records must be kept on file.
 - VII) Gas monitor filters should be checked at least every 12 months.

18) Employer's Record of Employee Training

- A) See Training bulletin board for dates of training.

**Electric City Utilities Water Operations**

314 Tribble Street
Anderson, South Carolina 29625
(864) 231-5230
Fax (864) 332-5343
www.cityofandersonsc.com

Confined Space Entry Permit

Date / Time Issued: _____ Date / Time Expires: _____
Job Site / Space ID: _____
Equipment to be worked on / Work to be performed: _____

Entry Supervisor: _____ Attendant(s): _____
Entrants: 1) _____ 3) _____
2) _____ 4) _____

	(NO ENTRY)	Yes	No	N/A
1. Source Isolation		()	()	()
Valves Closed:		()	()	()
2. Ventilation Modification		()	()	()
Natural Ventilation Only		()	()	()
Mechanical Ventilation		()	()	()
3. Atmospheric Check After Isolation and Ventilation				
Atmospheric Checked at the:	Top: _____	Middle: _____	Bottom: _____	
Oxygen _____ % > 19.5%	LEL _____ % < 10%			
CO _____ % < 35 PPM	H ₂ S _____ < 10 PPM			Time: _____

Tester's Signature: _____

4. Communication Procedures:

5. Rescue Procedures and Phone Numbers **1) CALL 911** 2) Self Rescue 3) Non-Entry Rescue
4) Entry Rescue: _____

	Yes	No
6. Entry and Attendant		
Successfully completed required training?	()	()
Is it current?	()	()

	Yes	No
7. Equipment		
Direct reading gas monitor tested?	()	()
Safety harness and lifelines for entry persons	()	()
Tripod and non-entry rescue equipment	()	()
Powered communication equipment	()	()
Protective clothing (PPE)	()	()

ENTRY CANNOT BE APPROVED IF THERE ARE ANY CHECKS IN THE "NO" COLUMN. THIS PERMIT IS NOT VALID UNLESS ALL APPROPRIATE ITEMS ARE COMPLETED.

8. Periodic Atmospheric Tests

Time _____	Oxygen _____ %	LEL _____ %	H ₂ S _____ %
Time _____	Oxygen _____ %	LEL _____ %	H ₂ S _____ %
Time _____	Oxygen _____ %	LEL _____ %	H ₂ S _____ %
Time _____	Oxygen _____ %	LEL _____ %	H ₂ S _____ %
Time _____	Oxygen _____ %	LEL _____ %	H ₂ S _____ %

9. Supplemental Information (LOTO, Hot Work Permits, etc.): _____

Permit Approved By (Entry Supervisor): _____

Signature for Permit Cancellation: _____ Time: _____