

Confined Space Safety



OSHAcademy Course 605 Study Guide

Confined Space Safety

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Contact OSHAcademy to arrange for use as a training document.

This study guide is designed to be reviewed off-line as a tool for preparation to successfully complete OSHAcademy Course 605.

Read each module, answer the quiz questions, and submit the quiz questions online through the course webpage. You can print the post-quiz response screen which will contain the correct answers to the questions.

The final exam will consist of questions developed from the course content and module quizzes.

We hope you enjoy the course and if you have any questions, feel free to email or call:

OSHAcademy

1915 NW Amberglen Parkway, Suite 400

Beaverton, Oregon 97006

www.oshatrain.org

instructor@oshatrain.org

+1.888.668.9079

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Course Introduction

Many workplaces contain spaces that are considered to be “confined” because their configurations hamper the activities of employees who must enter into, work in or exit from them. In many instances, employees who work in confined spaces also face increased risk of exposure to serious physical injury from hazards such as entrapment, engulfment and hazardous atmospheric conditions. Confinement itself may pose entrapment hazards and work in confined spaces may keep employees closer to hazards such as machinery components than they would be otherwise. For example, confinement, limited access and restricted airflow can result in hazardous conditions that would not normally arise in an open workplace.



The terms “permit-required confined space” and “permit space” refer to spaces that meet OSHA’s definition of a “confined space” **and** contain health or safety hazards. For this reason, OSHA requires workers to have a permit to enter these spaces.

This course will discuss the types of confined spaces an employee may enter and the type of training needed to protect them from the hazardous materials that may exist inside a confined space.

Module 1: Confined Space Basics

OSHA's Confined Space Standard

OSHA's standard for confined spaces (29 CFR 1910.146) contains the requirements for practices and procedures to protect employees in the general industry from the hazards of entering permit spaces.

General industry employers must evaluate their workplaces to determine if spaces are permit spaces.

If a workplace contains permit spaces, the employer must inform exposed employees of their existence, location and the hazards they pose.

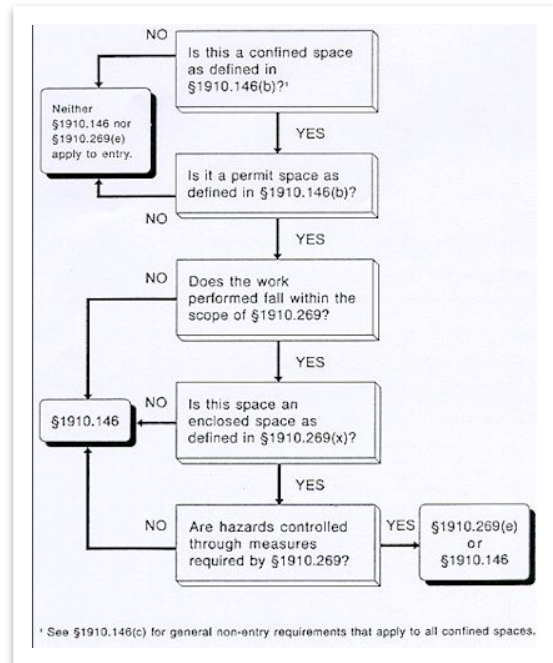
This can be done by posting danger signs such as "DANGER-PERMIT-REQUIRED CONFINED SPACE-AUTHORIZED ENTRANTS ONLY" or using an equally effective means. If employees don't need to enter and work in permit spaces, employers must take effective measures to prevent them from entering these spaces. An employer is required to block or securely seal off the confined space so employees cannot enter the area. If employees are expected to enter permit spaces, the employer must develop a written permit space program and make it available to employees or their representatives.

Confined Space Definition

OSHA's definition of a confined space is a space that:

- is large enough and configured so an employee can enter and perform assigned work;
- has limited or restricted means for entry or exit;
- and, is not designed for continuous employee occupancy.

Additionally, the ANSI standard defines a confined space as, "an enclosed area large enough and configured to allow a person to enter."



General Industry employers can use this flow chart to determine if spaces are permit spaces.



According to ANSI, a confined space also has the following characteristics:

- Its primary function is other than human occupancy.
- It has restricted entry and exit. This means the entry and exit is a physical configuration, which requires the use of the hands for support to enter into or exit from a confined space.

Here are some examples of confined spaces:

- | | |
|------------|------------|
| • Tanks | • Vaults |
| • Manholes | • Pipes |
| • Boilers | • Trenches |
| • Furnaces | • Tunnels |
| • Sewers | • Ducts |
| • Silos | • Bins |
| • Hoppers | • Pits |



Why Confined Spaces are Hazardous to Entrants

Confined spaces are deceiving. A confined space often appears to be harmless; no danger signs are apparent and the space may have been entered on prior occasions without incident. However, a worker cannot assume conditions have not changed and the space is safe for entry each time. Some materials may pose an immediate threat to the life and health of the worker entering the space.

However, the dangerous materials, such as hydrogen fluoride gas, may cause a sudden or fatal collapse 12-72 hours after exposure. The victim “feels normal” after recovery from transient effects until collapse. Such materials in hazardous quantities are considered to be “immediately” dangerous to life or health.



Below is a list of other hazards that could be encountered while working in a confined space:

- Space configurations such as small openings and inwardly converging walls, which can trap an entrant, restrict easy entry and exit, or impede rescue.

- Atmospheric hazards such as gasoline tank vapors, combined with limited ventilation. Such conditions can cause asphyxiation or explosion.
- Physical hazards, such as unstable grain contained in silos, which can engulf a worker.
- All other serious hazards associated with general industry, such as electrical equipment, moving machinery, falling objects, and wet or slippery surfaces.

Below is a list of potential hazards to be aware of when working in a confined space:

- No ventilation (pits and vaults seldom opened).
- Leaking chlorine gas (which is heavier than air) can accumulate in low-lying spaces.
- Oxygen depletion; which can be caused by:
 - Rotting vegetation and decaying dead animals.
 - Corroding or rusting machinery.

Glossary of Terms

Take a look at a glossary of terms for confined spaces, according to 29.CFR 1910.146:

Acceptable Entry Conditions: The conditions that must exist in a permit space to allow entry and to make sure employees involved with a permit-required confined space entry can safely enter into and work within the space.

Attendant: An individual stationed outside one or more permit spaces who monitors the authorized entrants and who performs all attendant duties assigned in the employer's permit space program.

Authorized Entrant: An employee who is authorized by the employer to enter a permit space.

Blanking or Blinding: The absolute closure of a pipe, line or duct by the fastening of a solid plate that completely covers the bore and is capable of withstanding the maximum pressure of the pipe, line or duct with no leakage beyond the plate.



Blanking or blinding example

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

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

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

Entry: The action by which a person passes through an opening into a permit-required confined space. Entry includes ensuring work activities in that space and is considered to have occurred as soon as **any** part of the entrant's body breaks the plane of an opening into the space.

Entry Permit: The written or printed document that is provided by the employer to allow and control entry into a permit space.

Entry Supervisor: The person (such as the employer, foreman or crew chief) responsible for determining if acceptable entry conditions are present at a permit space where entry is planned.

Hazardous Atmosphere: An atmosphere that may expose employees to the risk of death, incapacitation, and an impairment of ability to self-rescue, injury or acute illness from one or more of the following causes:

- Flammable gas, vapor or mist in excess of 10 percent of its lower flammable limit. (LFL);
- airborne combustible dust at a concentration that meets or exceeds its LFL;
- atmospheric oxygen concentration below 19.5 percent or above 23.5 percent;
- and, any other atmospheric condition that is immediately dangerous to life or health.

Hot Work Permit: The employer's written authorization to perform operations capable of providing a source of ignition.

Immediately Dangerous to Life or Death (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.

Inerting: The displacement of the atmosphere in a permit space by a non-combustible gas to such an extent that the resulting atmosphere is non-combustible. (NOTE: This procedure produces an IDLH oxygen-deficient atmosphere.)

Isolation: The process by which a permit space is removed from service and completely protected against the release of energy and material into the space by such means as: blanking or blinding; misaligning or removing sections of lines, pipe, or ducts; a double block and bleed system; **lockout or tagout** of all sources of energy; or **blocking or disconnecting** all mechanical linkages.

Oxygen Deficient Atmosphere: An atmosphere containing less than 19.5% oxygen by volume.

Oxygen Enriched Atmosphere: An atmosphere containing more than 23.5% oxygen by volume.

Permit-required Confined Space Program/Permit System: Employer's overall program for controlling and protecting employees from permit space hazards and for regulating employee entry into permit spaces. Employer must have a written procedure for preparing and issuing permits.

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

Rescue Service: The personnel designated to rescue employees from permit spaces.

Retrieval Service: The equipment (including a retrieval line, chest or full-body harness, wristlets, if appropriate and a lifting device or anchor) used for non-entry rescue of persons from permit spaces.

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

Permit-Required Confined Space

A permit-required confined space is space that has one or more of the following characteristics:

- Contains or has potential to contain hazardous atmosphere
- Contains material that has the potential for engulfing entrant
- Has internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls or by floors or slopes downward and tapers to smaller cross-section



- Contains any other serious safety or health hazard

Some examples of permit-required confined spaces are manholes going into sewers, grain silos and trenches.

Real-Life Scenario

On February 4, 2004, a 23-year-old tank mechanic died when he entered a permit-required confined space. The mechanic was assigned to prepare a shipping container used to transport silicon tetrachloride for an inspection. The tank had been purged with an inert nitrogen atmosphere. While waiting for the inspector to arrive, the mechanic entered the tank for an unknown reason, apparently without first testing the atmosphere, and died of asphyxiation. When the victim was discovered about an hour later, a coworker



jumped into the tank. He also didn't test the atmosphere first and lifted the victim up to others standing on top of the tank. Testing by fire department responders showed the atmosphere at the bottom of the tank to be about 12% oxygen, below the minimum safe level of 19.5% oxygen.

Recommendations:

- Employers must evaluate confined spaces in the workplace. A permit-required confined space requires written entry procedures, including posted documentation of test results by an authorized person.
- Never enter a confined space without first testing the atmosphere with an appropriate air-monitoring instrument.
- Never enter a confined space without appropriate personal protective equipment for safe entry.

A trained attendant must monitor workers in a confined space and be prepared for an emergency response that does not involve a direct entry of the space.

Non-Permit Required Confined Space

This is a confined space that does NOT contain or have the potential to contain any hazard capable of causing death or serious physical harm.

Here are some examples of a non-permit required confined space:

- Drop ceiling
- Motor control cabinets

Location of Confined Spaces

Confined spaces are found not only in industrial settings but also in public places such as shopping malls and large public swimming pools. Waterfalls and water fountain displays used in malls for beautification may have pump vaults or valve pits that are seldom entered. Some swimming pool pumps are placed in vaults below ground. There have been reports of maintenance employees entering these areas and losing consciousness.

That was a lot of information to remember! It's now time for the first module quiz. Good luck!

Module #1 Quiz

Use this quiz to self-check your understanding of the module content. You can also go online and take this quiz within the module. The online quiz provides the correct answer once submitted.

1. What must an employer do if workers need to enter permit confined spaces?

- a. Develop a written permit space program
- b. Authorize the entrance
- c. Require workers to enter the confined space with a “buddy.”
- d. Enter themselves first

2. Which of the following are examples of a confined space?

- a. Tanks
- b. Manholes
- c. Vaults
- d. All of the above

3. Dangerous materials in a confined space may cause a sudden or fatal collapse _____ after exposure.

- a. 6 hours
- b. 12-72 hours
- c. 5 hours
- d. the next day

4. _____ is a condition that poses an immediate or delayed threat to life.

- a. Immediately dangerous to life or death
- b. Engulfment
- c. Prohibited condition
- d. Testing

5. A (n) _____ is an atmosphere containing less than 19.5% oxygen by volume.

- a. oxygen-deficient atmosphere
- b. oxygen-enriched atmosphere
- c. prohibited condition
- d. hazardous atmosphere

Module 2: Confined Space Entry Team

Introduction

Your safety department will probably be responsible for developing the confined space program. Your line managers should always be responsible for deploying or implementing the program. Remember, safety is a line responsibility, not a staff support responsibility. Line and staff managers should:

- Ensure that a list of confined spaces is maintained,
- Ensure that canceled permits are reviewed for lessons learned,
- Ensure training of entry team members (authorized entrants, attendants, and entry supervisors) and other affected persons are conducted,
- Ensure coordination with outside emergency responders,
- Ensure personal protective equipment is in compliance with standards, and
- Maintain a master inventory of identified confined spaces.

Confined Space Entry Supervisor Responsibilities

The Confined Space Entry Supervisor holds a key position with important responsibilities. This position is in charge of confined space work and should:

- Ensure requirements for entry have been completed before entry is authorized
- Authorizing entry and overseeing entry operations
- Ensure confined space monitoring is performed by personnel qualified and trained in confined space entry procedures
- Ensure a list of monitoring equipment and personnel qualified to operate the equipment is maintained by the employer
- Ensure that the rescue team has simulated a rescue in a confined space within the past twelve months
- Know the hazards that may be faced during entry, including the mode, signs or symptoms, and consequences of exposure
- Fill out a permit when it is required
- Determine the entry requirements and that conditions are acceptable for entry
- Notify all involved employees of the permit requirements
- Post the permit in a conspicuous location near the job
- Renew the permit or have it reissued as needed (a new permit is required every shift)
- Determine the number of attendants required to perform the work



- Perform duties as the confined space attendant if required
- Ensure the attendant knows how to communicate with the entrants and how to obtain assistance
- Ensuring measures are in place to keep unauthorized personnel clear of the area
- Post any required barriers and signs
- Remain alert to changing conditions that might affect the conditions of the permits, (i.e., require additional atmospheric monitoring or changes in personal protective equipment)
- Serving as an attendant, as long as the person is trained and equipped appropriately for that role
- Change and reissue the permit, or issue a new permit as necessary
- Ensure periodic atmospheric monitoring is done according to permit requirements
- Ensure that personnel doing the work and all support personnel adhere to permit requirements
- Ensure the permit is canceled when the work is done
- Ensure the confined space is safely closed and all workers are cleared from the area
- Checking the work at least twice a shift to verify and document permit requirements are being observed (more frequent checks should be made if operations or conditions are anticipated that could affect permit requirements)
- Ensuring that necessary information on chemical hazards is kept at the work site for the employees or rescue team
- Ensuring a rescue team is available and instructed in their rescue duties (e.g., an on-site team or a prearranged outside rescue service)
- Ensuring at least one member of the rescue team has current certification in first aid and CPR
- Terminating entry procedures as required

Confined Space Entrant Responsibilities

Employees who are granted permission to enter a confined space should:

- Read and observe the entry permit requirements
- Stay alert to the hazards that could be encountered in a confined space
- Use the protective equipment required by the permit

Confined space entrants must immediately exit the confined space when:

- Ordered to do so by the attendant
- Automatic alarms sound
- They perceive they are in danger
- They notice physiological stresses or changes in themselves or co-workers (e.g., dizziness, blurred vision, shortness of breath)

Confined Space Attendant Responsibilities

The Attendant should be stationed outside the work space and should:

- Be knowledgeable of, and be able to recognize potential confined space hazards;
- Maintain a sign-in/sign-out log with a count of all persons in the confined space and ensure all entrants sign in/sign-out;
- Monitor surrounding activities to ensure the safety of personnel;
- Maintain effective and continuous communication with personnel during confined space entry, work and exit;
- Order personnel to evacuate the confined space if he/she:
 - Observes a condition which is not allowed on the entry permit;
 - Notices the entrants acting strangely, possibly as a result of exposure to hazardous substances;
 - Notices a situation outside the confined space which could endanger personnel;
 - Notices within the confined space a hazard which has not been previously recognized or taken into consideration;
 - Must leave his/her work station; or
 - Must focus attention on the rescue of personnel in some other confined space that he/she is monitoring;
- Immediately summon the Rescue Team if crew rescue becomes necessary; and
- Keep unauthorized persons out of the confined space, order them out, or notify authorized personnel of the unauthorized entry.



Confined Space Rescue Team Responsibilities

The Rescue Team members should:

- Complete a training drill using mannequins or personnel in a simulation of the confined space prior to the issuance of an entry permit for any confined space and at least annually thereafter;
- Respond immediately to rescue calls from the Attendant or any other person recognizing a need for rescue from the confined space;
- In addition to emergency response training, receive the same training as that required of the authorized entrants; and
- Have current certification in first-aid and CPR.

In the next module, we will go more in-depth about confined space rescues. But first, it's time for your module quiz.

Module #2 Quiz

Use this quiz to self-check your understanding of the module content. You can also go online and take this quiz within the module. The online quiz provides the correct answer once submitted.

1. The _____ is in charge of authorizing entry and overseeing entry operations at a confined space site.

- a. entry supervisor
- b. entrant
- c. attendant
- d. rescue team

2. The entrant must stay alert to the hazards in a confined space.

- a. True
- b. False

3. The rescue team should respond to rescue calls from the attendant _____.

- a. the next day
- b. as soon as possible
- c. immediately
- d. within an hour

4. Who must ensure the confined space permit is cancelled when the work is done?

- a. Entry supervisor
- b. Entrant
- c. Attendant
- d. Rescue team

5. Confined space entrants must immediately exit the confined space when _____.

- a. ordered to do so by the attendant
- b. an alarm sounds
- c. they perceive they are in danger
- d. all of the above

Module 3: Confined Space Rescues

Introduction

Two-thirds of all confined space fatalities occur among would-be rescuers. To prevent deaths, it is critical to use good confined space entry practices so there is no need for rescue operations. Remember, even a well-planned rescue can end up as a body retrieval. Rescues can be performed by any employee or a professional rescuer so long as he or she has been fully trained and qualified to act as a rescuer. Qualifications include knowledge of and experience working with all hazards associated with rescue and confined space entry operations.



Before a Rescue Attempt

At a minimum, employers and workers should treat all confined spaces as hazardous. Before entering a confined space to attempt a rescue, a person trained in the proper use of a calibrated, direct-reading instrument must also test for oxygen content, flammable gases and vapors, and potential toxic air contaminants in a confined space. You should never trust your senses to determine if the air in a confined space is safe. You cannot see or smell many toxic gases and vapors, nor can you determine if sufficient oxygen is present.

Employers and workers should also:

- Ensure that adequate atmospheric conditions are maintained in the spaces at all times through proper ventilation.
- In those situations in which safe atmospheric conditions cannot be maintained, evaluate if entry is absolutely necessary and/or if the work can be completed from outside the confined space. When entry is necessary, the appropriate respirator should be evaluated and worn by workers with thorough training in the use and limitations of respirators.
- Make sure that an attendant is present immediately outside the space in case the person in the space needs assistance, and ensure that an emergency retrieval or rescue method is available. Make sure a safe method of communication is available between the person entering the space and the attendant.
- Exit the space immediately if an unsafe condition develops.
- Ensure that structures are sound (safe) from collapse prior to entering confined spaces.
- Use proper personal protective equipment, which will be determined by the hazards that will be encountered in the confined space.

- Once confined spaces are identified, post warning signs to warn other response personnel, clean-up workers, and the public. When possible, physically block entry.
- Never enter a confined space to attempt an emergency rescue unless you have been trained in safe confined space entry and rescue procedures and have the proper tools and personal protective equipment.

Reasons for Entering Confined Spaces

Entering a confined space may be done for various reasons. It is done usually to perform a necessary function, such as inspection, repair, maintenance (cleaning or painting), or similar operations which would be an infrequent or irregular function of the total industrial activity.

Entry may also be made during new construction. One of the most difficult confined space entries to control is that of unauthorized entry, especially when there are large numbers of workers and trades involved, such as welders, painters, electricians, and safety monitors.

A final and most important reason for entry would be emergency rescue. This, and all other reasons for entry, must be well planned before initial entry is made and the hazards must be thoroughly reviewed.

Since deaths in confined spaces often occur because the atmosphere is oxygen deficient or toxic, confined spaces should be tested prior to entry and continually monitored. More than 60% percent of confined space fatalities occur among would-be rescuers; therefore, a well-designed and properly executed rescue plan is a must.

Fatalities can occur when the rescuers:

- Are overcome by their emotions
- Take unnecessary chances
- Do not know the hazards involved
- Do not have a plan of action
- Lack confined space rescue training

It is important to know that the period of time for successful rescue is very limited. Otherwise, a rescue attempt will become body retrieval. After only four minutes without oxygen, it is very likely a worker will experience asphyxiation, which may result in brain damage or death.

Preventing Confined Space Rescuer Fatalities

Planning the rescue is paramount. Make sure rescue team members understand their duties, and practice, practice, practice!

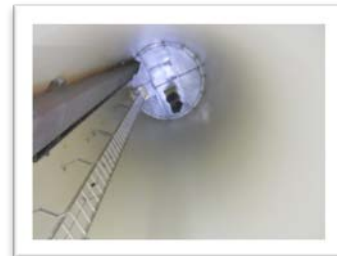
Ensure that the rescuer does not travel a greater distance than allowed by the air supply, self-contained breathing apparatus (SCBA), and escape cylinders. Analyze distance, space configurations, physical obstacles, and total time needed to enter the space, perform rescue operations, and leave the space. Leave the space immediately whenever a problem arises with respiratory protection equipment or whenever the attendant orders evacuation. Everyone involved in a rescue should assume that the space is deadly and that entry rescue may be required in the worst case!



Rescue Equipment

The importance of having the right rescue equipment on hand can't be stressed enough. Rescue equipment may include:

- Full body harness with retrieval line attached
- Wristlets (may be used in rescue when it can be shown that they are the safest and most effective means of rescue)
- Hand-cranked mechanical winch and tripod (required when entrant is five feet or more below the entrance)
- Ladder
- Explosion-proof lighting
- Stretcher
- Approved head protection
- First Aid equipment



A ladder, such as this one, is a good example of rescue equipment.

Full Body Harness and Retrieval Lines

All authorized entrants and rescuers entering permit spaces are required to use full body harnesses and retrieval lines, unless it is determined that the retrieval equipment would increase the overall risk of entry or would not contribute to the rescue operation.

Lowering and Lifting Entrants

Only devices designed by the manufacturer and approved for moving humans should be used. The equipment must enable a rescuer to remove the injured employee from the space quickly without injuring the rescuer or further harming the victim.



Full body harnesses and retrieval lines are necessary rescue equipment.

Respiratory Protection

If there is even a remote possibility of other atmospheric contaminants, even though monitoring equipment readings appear to be within the normal ranges, rescuers should still use appropriate respiratory protection. Play it safe: Do not use air purifying respirators for confined space rescue.

Figure 1 shows a rescue team wearing air-supplying respirators inside a confined space, in this case a tank.



Figure 1: Air-supplying respirators

If a hazardous atmosphere exists in the confined space such as toxic gases, an appropriate air-purifying respirator may be used. However, if the confined space has a lack of oxygen, an air-purifying respirator will do no good – there is no supply of oxygen to breathe in the first place. In this situation, an entrant would need to wear an air-supplying respirator. An air-supplying respirator will supply breathable air and will protect the entrant from breathing in hazardous air from the atmosphere of the confined space.

Real-Life Scenario

On September 6, 2010, a 51-year-old male volunteer fire fighter (victim) died after being overcome by low oxygen and sewer gases while climbing down into a sewer manhole in an attempt to rescue a village utility worker. The utility worker had entered the manhole to investigate a reported sewer problem and was overcome by low oxygen and sewer gases.

The incident occurred behind the fire station in an underground sewer line that ran under the fire station. The local utility company contacted the chief of the village's volunteer fire department and requested that a piece of fire apparatus be moved out of the station so they would not block it in while accessing a manhole.

The fire chief responded to the station to move fire apparatus so it would not be blocked by the utility trucks. The victim and another fire fighter also arrived at the station to assist. A utility worker entered the manhole behind the station to clear a sewer backup and was overcome by a lack of oxygen and sewer gases and then fell unconscious inside the manhole. The victim then entered the manhole without any personal protective equipment to help the utility worker and was also overcome by the low oxygen level and sewer gases. The victim and the utility worker were later removed from the sewer manhole by fire department personnel and transported to a local hospital where they were pronounced dead.

The medical examiner reported the cause of death as asphyxia due to low oxygen and exposure to sewer gases.

Key Recommendations

- Ensure that workers are properly trained and equipped to recognize the hazards of and participate in a confined space technical rescue operation
 - Ensure that standard operating procedures regarding technical rescue capabilities are in place and a risk benefit analysis is performed to protect the safety of all responders
 - Ensure that an effective incident management system is in place that supports technical rescue confined space operations
 - Ensure that a safety officer properly trained in the technical rescue field being performed is on scene and integrated into the command structure.
-

Module #3 Quiz

Use this quiz to self-check your understanding of the module content. You can also go online and take this quiz within the module. The online quiz provides the correct answer once submitted.

1. _____ of all confined space rescues occur among would-be rescuers.

- a. 1/2
- b. 2/3
- c. 3/4
- d. 2/4

2. What must happen before attempting a confined space rescue?

- a. Test for oxygen content
- b. Ensure adequate atmospheric conditions are maintained at all times
- c. Exit the space immediately if an unsafe condition develops
- d. All of the above

3. Employers and workers should treat all confined spaces as _____.

- a. unsafe
- b. hazardous
- c. easily accessible
- d. safe

4. After only _____ without oxygen, a worker will experience _____, which may result in brain damage or death.

- a. 2 minutes, choking
- b. 1 minute, lack of oxygen
- c. 4 minutes, asphyxiation
- d. 5 minutes, dizziness

5. Rescue equipment includes which of the following?

- a. Ladder
- b. Partial body harness
- c. Helmet
- d. Gloves

Module 4: Confined Space Training Requirements

Introduction

It's important the employer provides training so all employees who are required to perform confined space entry operations acquire the understanding, knowledge, and skills necessary for the safe performance of their duties in confined spaces.

The employer must provide training to all employees whose work involves confined spaces to gain the understanding, knowledge, and skills necessary to prepare their work safely.

Training should be provided to each employee who wishes to enter a confined space:

- before the employee starts work;
- 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 employer finds changes in the permit space entry procedures;
- or there are inadequacies in the employee's knowledge.



General Training Topics

All employees who will enter confined spaces must be trained in entry procedures. Personnel responsible for supervising, planning, entering or participating in confined space entry and rescue must be trained in their duties prior to any confined space entry.

Training should include:

- Explanation of the general hazards associated with confined spaces;
- Discussion of specific confined space hazards associated with the facility, location or operation;
- Reason for, proper use, and limitations of PPE and other safety equipment required for entry into confined spaces;
- Explanation of permits and other procedural requirements for conducting a confined space entry;
- A clear understanding of what conditions would prohibit entry;
- How to respond to emergencies;
- Duties and responsibilities as a member of the confined space entry team; and
- Description of how to recognize (1) symptoms of overexposure to probable air contaminants in themselves and co-workers, and (2) methods for alerting Attendants.

Refresher training should be conducted to maintain employee competence in entry procedures and precautions. If employees do not enter a confined space to perform work for an extended period of time (at least annually); they should be provided an opportunity to practice entry procedures.

Specific Training

Those entry team members who are responsible for monitoring confined space atmospheres should receive training on the proper use of monitoring and testing instruments. Training should include proper use of monitoring instruments such as:

- Proper use of the equipment;
- Knowledge of calibration;
- Knowledge of sampling strategies and techniques; and

Training should include the following:

- Procedures for summoning rescue or other emergency services, and
- Proper utilization of equipment used for communicating with entry and emergency/rescue personnel.

Training for Emergency Response Personnel

Training should include:

- Rescue plan and procedures developed for each type of confined space that are anticipated to be encountered
- Use of emergency rescue equipment
- First aid and CPR techniques
- Work location and confined space configuration to minimize response time

It is now time for your final module quiz! Good luck!



Module #4 Quiz

Use this quiz to self-check your understanding of the module content. You can also go online and take this quiz within the module. The online quiz provides the correct answer once submitted.

1. Training should be provided to each affected employee after he/she has started work in a confined space.

- a. True
- b. False

2. _____ training should be conducted to maintain employee competence in entry procedures and precautions.

- a. Refresher
- b. Annual
- c. Weekly
- d. Bi-weekly

3. Emergency response personnel training should include which of the following topics?

- a. Use of emergency rescue equipment
- b. First aid and CPR techniques
- c. Work location to minimize response time
- d. All of the above

4. When should the training be provided to employees who want to enter a confined space?

- a. After a change in assigned duties
- b. Whenever the employer finds changes in the permit space entry procedures
- c. Whenever there are inadequacies in the employee's knowledge
- d. Both B and C are correct