2021 OVERVIEW SERIES: PERMIT-REQUIRED CONFINED SPACES
FACT SHEET

LENGTH: 15 MINUTES

PROGRAM SYNOPSIS:
A confined space is defined as any space that is large enough to enter and perform work, has limited or restricted means of entry or exit and is not designed for continuous employee occupancy. The Occupational Safety and Health Administration, OSHA, requires employers to protect employees in general industry from the hazards of entry into permit-required confined spaces by developing a permit-required confined space program. Examples of confined spaces include manholes, tanks, vessels and pits.

PROGRAM OBJECTIVES:
After watching the program, the participant should be able to explain the following:
- The members of the confined space entry team and their duties;
- The purpose of entry permits;
- Why atmospheric testing & monitoring is important for confined space entry;
- What mechanical & engulfment hazards exist with confined space entry.

INSTRUCTIONAL CONTENT:

PERMIT-REQUIRED CONFINED SPACES - OVERVIEW
- A confined space is defined as any space that is large enough to enter and perform work, has limited or restricted means of entry or exit and is not designed for continuous employee occupancy.
- Examples of confined spaces include manholes, tanks, vessels and pits.
- When a confined space contains or has the potential to contain a hazardous atmosphere, an engulfment hazard, or any other serious safety or health hazard, or is configured in such a way that an entrant could be trapped or asphyxiated, then that space is considered to be a “Permit-Required Confined Space.”
- The Occupational Safety and Health Administration, OSHA, requires employers to protect employees in general industry from the hazards of entry into permit-required confined spaces by developing a permit-required confined space program.
- OSHA’s standard, 1910.146 titled: “Permit-Required Confined Spaces” outlines the requirements of the permit-required confined space program which includes identifying and labeling permit spaces with a “Danger – Permit-Required Confined Space-Do Not Enter” sign and the development of a “permit system” which is a written program that controls the issuing of Entry Permits.
- No employee may enter any permit-required confined space unless they are an authorized entrant and approved to enter the space as part of a valid Entry Permit and working as part of an approved Entry Team.
- Written Entry Permits are used to document the control of hazards and ensure worker safety during confined space entry operations.
- The confined space entry team consists of the Entry Supervisor, the Attendant and the Entrant.
- The Entry Supervisor is in charge of the operation and uses the Entry Permit as a checklist to make sure all precautions required to make a safe entry have been followed prior to allowing entry to begin. This includes controlling any atmospheric, engulfment or other safety and health hazards that may exist.
- The Confined Space Attendant monitors the conditions inside and outside the confined space as well as the condition of the entrants inside the space. During an emergency, the Standby Attendant must not enter the space and must contact rescue services immediately.
- Permit-required confined spaces can be very dangerous. Never enter this type of space unless you are an authorized entrant working under a valid Confined Space Entry Permit.

PERMIT-REQUIRED CONFINED SPACES: THE ENTRY PERMIT

- The entry permit is a written or printed document provided by the employer to allow and control entry into a permit-required confined space.
- No permit-required confined space may be entered without a valid entry permit.
- The entry permit must contain the following information: the identity of the permit space to be entered and the purpose of the entry, the date and the authorized duration of the entry permit, a listing of authorized entrants such that the attendant can determine quickly and accurately which authorized entrants are inside the permit space, and the name of anyone serving as an attendant and the name of the current serving entry supervisor.
- Also required is the signature or initials of the entry supervisor who originally authorized the entry.
- The entry permit must also list the hazards of the permit space to be entered as well as the measures used to eliminate or control those hazards prior to entry. For example, the locking and tagging of equipment and procedures for isolating, purging or ventilating the space.
- The permit must specify the atmospheric conditions and any other condition that must exist in the space to allow safe entry and work to be performed and the results of initial and periodic tests that confirm the existence of those acceptable entry conditions. The test results must be accompanied by the names or initials of the testers and an indication of when the tests were performed.
- In addition, the entry permit must describe the communication procedures used by authorized entrants and attendants to maintain contact during the entry, as well as the identity of the rescue and emergency services that can be summoned in the event of emergency, and the means for summoning those services.
- And finally, a listing of all equipment to be used or have on hand during the entry and a listing of any additional work permits, such as for hot work, that have been issued as part of the authorized entry.
- Again, the Written Entry Permit is used to document the control of hazards and ensure worker safety during confined space entry operations.
- The Entry Supervisor uses the Entry Permit as a checklist to make sure that all precautions required to make a safe entry have been followed prior to allowing the entry to begin.
- All members of the entry team must be familiar with the information contained on the Entry Permit.

PERMIT-REQUIRED CONFINED SPACES: HAZARDOUS ATMOSPHERES

- A "Hazardous Atmosphere" as it relates to a confined space, is any atmosphere within the space that may expose employees to the risk of death, incapacitation, injury, acute illness or would interfere with an individual’s ability to escape unaided from the space.
- Some common causes of hazardous atmospheres include:
- Explosive atmospheres, which exist when any flammable gas, vapor or mist exceeds 10 percent of its lower flammable limit or when airborne combustible dust is present that meets or exceeds its lower flammable limit.
- Oxygen-Deficient Atmospheres, which exist when oxygen levels fall below 19.5 percent, which is not enough oxygen for sufficient breathing. A common cause of an oxygen deficient atmosphere is when another gas, such as nitrogen displaces the oxygen within the space.
- Oxygen-Rich Atmospheres, which exist when oxygen levels exceed 23.5 percent. At this oxygen level any source of ignition could cause a fire or explosion.
- Toxic Atmospheres, which exist when the space contains concentrations of toxic or hazardous substances that exceed the permissible exposure limit or dose of the substance. Hydrogen Sulfide and Carbon Monoxide are common gases that can create a toxic atmosphere inside a confined space.
- When an atmosphere inside a confined space poses an immediate or delayed threat to life or would cause irreversible adverse health effects or would interfere with an individual's ability to escape unaided from the space, that atmosphere is referred to as "Immediately Dangerous to Life or Health” which is also called an “IDLH” atmosphere.
- The confined space entry permit will specify the atmospheric testing and monitoring required to detect atmospheric hazards as well as the methods that must be used to control those hazards.

PERMIT-REQUIRED CONFINED SPACES: ATMOSPHERIC TESTING & MONITORING

- Atmospheric testing and monitoring are used to detect the presence of atmospheric hazards prior to and during confined space entry operations.
- Testing the atmosphere of a confined space must be done with a calibrated, direct-reading instrument.
- Prior to initial entry, the atmosphere must be tested for oxygen content, flammable gases and vapors and potential toxic air contaminants. The testing must be done in this specific order.
- The test results must be recorded on the entry permit. The test results must be accompanied by the names or initials of the testers and an indication of when the tests were performed.
- Any employee who enters the space, or that employee's authorized representative, shall be provided an opportunity to observe the pre-entry atmospheric testing.
- When testing the atmosphere, it is critical that readings be taken at the top, middle and bottom of the space to locate varying concentrations of gas and vapors. This is because gases can accumulate at the top or bottom of a space depending on if they are more or less dense than air.
- If atmospheric testing indicates a hazardous atmosphere exists, forced-air ventilation must be used to eliminate the hazard before the space may be entered and the ventilation must continue while any employee is inside the space.
- Monitoring of the atmosphere must continue during the entry.
- If a hazardous atmosphere is detected at any time during the entry process, all employees must exit the space immediately.

PERMIT-REQUIRED CONFINED SPACES: MECHANICAL & ENGULFMENT HAZARDS

- When a confined space contains the potential for mechanical or engulfment hazards, these hazards must be listed on the entry permit.
- Some examples of mechanical hazards that may exist in a confined space include rotating shafts, screw conveyors and mixing or cutting blades.
- Engulfment hazards exist when workers can fall into certain materials that can trap or engulf them. A common example of this occurs in grain silos or corn bins.
- Employees can also be engulfed, drowned or crushed when materials are inadvertently released into a confined space while work is in progress.
- There are a variety of procedures that may be used to control these types of hazards and the specific procedures relevant to the confined space to be entered must be listed on the entry permit.
- For example, line-breaking and blanking may be required to isolate a space and prevent the inflow of materials; lockout/tagout procedures may be required to properly de-energize any type of moving equipment or machinery.
- The entry permit will specify the required hazard control procedures and it is the duty of the Entry Supervisor to certify that all hazards have been eliminated or controlled prior to entry.

PERMIT-REQUIRED CONFINED SPACES: THE ENTRY SUPERVISOR

- The entry supervisor is the member of the confined space entry team that is in charge of the overall operation.
- The entry supervisor uses the written permit as a checklist to make sure all precautions required to make a safe entry have been followed prior to allowing entry to begin.
- The supervisor also makes sure that: all atmospheric testing has been completed, acceptable entry conditions exist, all procedures and equipment listed on the permit are in place and the confined space rescue service is standing by and available, if needed.
- To approve entry into the space, the entry supervisor must sign the entry permit. Periodically, during the entry, the entry supervisor must confirm that the entry operations and the condition of the space remain consistent with terms specified in the permit.

- If the entry supervisor discovers any condition that violates the requirements of the entry permit, he or she must cancel the permit and make sure all entrants immediately evacuate the space.
- When the entry supervisor confirms the work in the space has been completed, he or she must cancel the permit and ensure it is retained for at least one year.

PERMIT-REQUIRED CONFINED SPACES: THE ATTENDANT

- The Attendant is the member of the confined space entry team that monitors the conditions inside and outside the space as well as the condition of the entrants inside the space.
- The attendant must be familiar with any potential hazards of the space and be able to recognize the signs and symptoms of exposure to those hazards.
- The attendant must also be able to identify the personnel inside the space at all times and maintain contact with them through radio or other means.
- If the attendant discovers conditions prohibited by the permit or an entrant displays behavior that could indicate hazardous conditions, he or she must call for all entrants to exit the space.
- Should an entrant become unable to exit the space under his or her own power, the attendant must contact the rescue service immediately.
- Although the attendant must also be trained as an entrant, the attendant must NOT enter the space and must prevent unauthorized employees from entering while waiting for rescue personnel to arrive.

PERMIT-REQUIRED CONFINED SPACES: THE ENTRANT

- The Entrant is the member of the confined space entry team who enters the confined space to perform work. The entrants are the only members of the entry team permitted to enter the space.
- Entering the space is defined any part of the entrant's body breaking the plane of an opening into the space.
- Entrants must receive training on confined space hazards, the safe use of equipment and PPE and the confined space entry procedures. An entrant must be able to demonstrate their capabilities before being permitted to enter a confined space.
- Entrants must also understand the specific hazards of every space they enter and be aware of any symptoms of exposure and warning signs that indicate the onset of dangerous conditions.
- While inside the space, the entrants must maintain communications with the attendant so the attendant can monitor the condition of the entrant and the operation’s status.
- Entrants have the authority to call for an evacuation of the space and must do so when they recognize any sign or symptom of exposure to a dangerous situation or when any condition that violates the entry permit is discovered.

ANSWERS TO THE REVIEW QUIZ

1. b
2. b
3. a
4. a
5. e
6. d
7. a
8. b
9. a
10. a

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REVIEW QUIZ

Name_____Date_____

The following questions will help to determine how well you understand the information presented in this program.

1. Which of the following does not describe a confined space?

a. Is large enough to enter and perform work
b. Has adequate and unrestricted means of entry or exit
c. Is not designed for continuous employee occupancy
d. Requires an entry permit when serious hazards may exist

2. Which of the following is not a member of the confined space entry team?

a. Entry Supervisor
b. Rescue Captain
c. Attendant
d. Entrant

3. No permit-required confined space may be entered without a valid entry permit.

a. True
b. False

4. The Entry Permit is used as a checklist to make sure all precautions required to make a safe entry have been followed.

a. True
b. False

5. A hazardous atmosphere is any atmosphere within the space that may expose employees to the risk of _____.

a. Death
b. Injury
c. Acute illness
d. Being unable to escape unaided from the space
e. All of the above

6. When testing the atmosphere, it is critical that readings be taken at the _____of the confined space.

a. Top
b. Middle
c. Bottom
d. All of the above

7. If a hazardous atmosphere is detected at any time during the entry process, all employees must exit the space immediately.

a. True
b. False

8. It is the duty of the _____ to certify that all hazards have been eliminated or controlled prior to entry.

a. Entrant
b. Entry supervisor
c. Attendant
d. Rescue squad

9. During an emergency inside the space, the attendant must not enter the space while waiting for rescue personnel to arrive.

a. True
b. False

10. While inside the space, the entrant must maintain communication with the attendant.

a. True
b. False