

COAD

Corporation for Ohio Appalachian Development

COAD

Confined Space Awareness

Kevin McCoy

kmccoy@coadinc.org

Scott Kashuba

scott.kashuba@development.ohio.gov

Special Dangers of Confined Spaces

Confined Space- is a space whose configuration and/or contents may present special dangers not found in normal work areas.

- Confined spaces may be poorly ventilated and, as a result, contain insufficient oxygen or hazardous levels of toxic gases.
- Working in a tight space can prevent a worker from keeping a safe distance from mechanical and electrical hazards.
- Fumes from a flammable liquid that is used in a poorly ventilated area can reach explosive levels.
- Such hazards endanger both the workers in the confined space and others who become exposed to the hazards when they attempt to rescue injured workers.
- In a number of cases, rescue workers have themselves died or been injured because they did not have the training and equipment necessary to conduct the rescue safely.

Confined Spaces and Permit Spaces

The distinction between ***confined spaces*** and ***permit spaces*** is crucial to understanding what the standard requires. Briefly, a ***permit space*** is a ***confined space*** containing a serious hazard or hazards.

Employers must evaluate all ***confined spaces*** to determine whether they are ***permit spaces*** but must take steps to protect workers only if a space is classified as a ***permit space***.

Confined Spaces and Permit Spaces

A ***confined space*** is a space that:

- (1) Is large enough and so arranged that an employee can bodily enter it;
- (2) Has limited or restricted means for entry and exit; and
- (3) Is not designed for continuous employee occupancy.

A space has a **limited or restricted means of exit** if a person could not readily escape from the space in an emergency. Any of the following factors indicate that a work space has a limited or restricted means of exit:

- The need to use a ladder or movable stairs, or stairs that are narrow or twisted;
- A door that is difficult to open or a doorway that is too small to exit while walking upright;
- Obstructions such as pipes, conduits, ducts, or materials that a worker would need to crawl over or under or squeeze around;
- The need to travel a long distance to a point of safety.

Confined Spaces and Permit Spaces

A space is **not designed for continuous employee occupancy** if it is not designed with features such as ventilation, lighting, and sufficient room to work and move about that are needed if people are to occupy it continuously.

A ***permit-required confined space (permit space)*** is a confined space that:

- (1) Contains or has the potential to contain a hazardous atmosphere;
- (2) Contains a material that has the potential for engulfing an entrant;
- (3) Has an internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls or by a floor which slopes downward and tapers to a smaller cross section; or
- (4) Contains any other recognized serious safety or health hazard.

Confined Spaces and Permit Spaces

Employers must take steps to protect workers only if they work in a permit space. In addition, they must take effective steps to prevent workers they control from entering the space unless the workers are authorized to enter.

Employer Responsibilities

All employers engaged in construction work must

- (1) identify any confined spaces in which their workers will be working, and
- (2) determine whether any such spaces are permit spaces.

When workers work in permit spaces, they must be protected against the hazards in those spaces. To ensure such protection, the Confined Spaces standard imposes duties on “entry employers,” “host employers,” and “controlling contractors.”

Employer Responsibilities

An **entry employer** is an employer who decides that an employee it directs will enter a permit space.

A **controlling contractor** is the employer with overall responsibility for construction at the worksite. The controlling contractor is responsible for coordinating entry operations when there is more than one entry employer and when other activities on the site could foreseeably result in a hazard in the permit space.

A **host employer** is the employer that owns or manages the property where the construction work is taking place. Where the host employer has information about permit space hazards on the site, it must share that information with the controlling contractor, who is then responsible for sharing it with the other employers on the site.

Overview of the Standard

Employers must take the following steps to protect workers against confined space hazards.

Have a competent person identify all confined spaces in which its employees may work.

A **competent person** is “one who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has the authority to take prompt corrective measures to eliminate them.” The competent person need not be an employee of any particular employer. The various contractors on a site may use a single individual to perform the duties required of a competent person.

Overview of the Standard

Employers must take the following steps to protect workers against confined space hazards.

If confined spaces are present, the employer must have the competent person determine whether the confined spaces are “permit spaces.”

A permit space 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 for engulfing an entrant;
- (3) has an internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls or by a floor which slopes downward and tapers to a smaller cross section; or
- (4) contains any other recognized serious safety or health hazard.

Permit Space

The protection that is required depends on the type and severity of the hazards present in the permit space. The following lists the three categories of permit spaces for which different levels of protection are specified.

Permit spaces that do not qualify for one of the two exceptions.

If the employer's workers will enter the space, develop and follow a written permit required confined space program, or permit space program. The permit space program specifies, among other things, how the employer will (1) regulate worker entry into permit spaces; and (2) control permit space hazards.

All employers must inform their workers about the locations and dangers of each permit space (e.g., post signs), and take additional steps to ensure that workers do not enter permit spaces if they are not authorized to do so.

Permit Space

Exception 1: Spaces that contain only physical (non-atmospheric) hazards.

If the physical hazards are eliminated or isolated so that they no longer present a hazard, the space may be reclassified as a non-permit space, with no further precautions required.

Exception 2: Spaces containing an atmospheric hazard that can be controlled by continuous forced air ventilation.

As long as the atmospheric hazard is controlled by continuous forced air ventilation and any physical hazards are eliminated or isolated, the alternate procedures may be used instead of full permit space procedures, although the space is still classified as a permit space.

Permit Space

The entry employer must train workers who work in a permit space.

Employers must identify:

- the worker(s) authorized to enter the space;
- an attendant who must remain outside the space and monitor the workers within; and
- an entry supervisor with overall responsibility for seeing that the program is followed.

The entry employer must plan to rescue entrants who cannot exit the space under their own power.

The entry employer must ensure that a worker who becomes sick or injured in a permit space can be rescued in a safe and timely manner.

Its permit space program must specify whether the employer plans to use its own workers, a rescue team of another on-site employer, or an outside rescue service if the need for a rescue arises.

Identifying Permit Spaces

Does the space contain or have the potential to contain a hazardous atmosphere?

Most deaths and injuries in confined spaces result from atmospheric hazards. Such hazards include insufficient oxygen and toxic or flammable chemicals. The competent person must evaluate, including testing as necessary, whether the following hazards are or may be present, before workers enter the space:

- Oxygen deficiency (concentration less than 19.5 percent) or excess (concentration above 23.5 percent).
- Concentration of any flammable gas, vapor, or mist in excess of 10 percent of its lower explosive limit:
- Airborne combustible dust at a concentration equal to or greater than its lower explosive limit.
- Atmospheric concentration of any substance that can cause death, incapacitation, impairment of ability to self-rescue, injury or acute illness.

Identifying Permit Spaces

In evaluating atmospheric hazards, the competent person must consider:

- The hazards present in the space before any workers enter;
- Whether the work that will be performed can introduce toxic, flammable, or combustible air contaminants or lead to an excess or deficiency of oxygen.

The competent person must also evaluate chemicals for which no PEL is set by OSHA. For example, if a product's label or the product manufacturer's safety data sheet warns that a product is harmful if inhaled and should not be used without adequate ventilation, the competent person must evaluate whether use of that product in a confined space requires the space to be classified as a permit space.

Identifying Permit Spaces

Does the space have an internal configuration such that an entrant could be trapped by inwardly converging walls or by a floor that slopes downward and tapers to a smaller cross section?

- An area of a confined space with a small cross section can develop a hazardous atmosphere if ventilation is inadequate. In addition, a space of this configuration could prevent an injured worker from escaping the space and add to the difficulty of rescuing the worker.

Identifying Permit Spaces

Does the space contain any other recognized serious safety or health hazard(s) that pose an immediate danger to a worker's life or health or would impair the worker's ability to escape from the space in the event of injury?

- Hazards that the competent person should consider include fire and explosion hazards, the presence of mechanical, electrical, hydraulic and pneumatic energy, temperature extremes, radiation, noise, corrosive chemicals, and biological hazards (such as venomous animals or insects).

Reclassifying a Permit Space as a Non-Permit Space

A permit space that contains only physical hazards may be reclassified as a non-permit space if:

- (1) the physical hazards are eliminated or isolated without entering the space; or
- (2) the physical hazards are eliminated or isolated by entering the space using permit space procedures.

Physical hazards include all hazards that are not atmospheric hazards, including: explosives (other than explosive atmospheres); mechanical, electrical, hydraulic and pneumatic energy; radiation; temperature extremes; engulfment; noise; inwardly converging surfaces; and chemicals that can cause death or serious physical harm through skin or eye contact (rather than through inhalation).

Reclassifying a Permit Space as a Non-Permit Space

Example: A confined space contains electrical machinery that presents mechanical and/or electric shock hazards. If the hazards presented by the machinery are eliminated by de-energizing and locking out the machinery at an electrical panel outside the space, the space can be reclassified as a non-permit space as long as the equipment remains de-energized and locked out. If it is necessary to enter the space to de-energize and lock out the machinery, the entry must be conducted pursuant to a full permit program. However, once the machinery is de-energized and locked out, the space may then be reclassified as a non-permit space.