



By Jerome Spear, CSP, CIH

# Understanding Confined Space Standards for Well Drilling

Many water well drilling sites contain spaces that are considered to be confined or enclosed because their configurations hinder the activities of employees who must enter into, work in, or exit from these spaces.

And employees who work in confined spaces also face increased risk of exposure to serious physical injury from entrapment, engulfment, and hazardous atmospheric conditions.

## Definitions

The term “permit-required confined space” refers to spaces that meet the Occupational Safety and Health Administration’s definition of a confined space and that contain health or safety hazards. For this reason, OSHA requires workers to have a permit to enter these spaces.

In order to know whether the space requires a permit, the first task for employers is to recognize what constitutes a confined space. By definition, a confined space has three requirements according to OSHA’s general industry confined space standard, all of which must be present.

1. A confined space is large enough for an employee to enter fully and perform assigned work.
2. A confined space is not designed for continuous occupancy by an employee.

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3. A confined space has a limited or restricted means of entry or exit.

OSHA’s confined space standard is written in performance-oriented language, outlining the requirements employers must take. The precautions and controls for each confined space are based on a hazard evaluation of the space.

As each space is unique, it is the employer’s responsibility to evaluate the hazards of the confined space. Based on those identified hazards, the space is then classified as either a permit-required confined space or a non-permit confined space.

A permit-required confined space has one or more of these characteristics:

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

## Standards

Employers in general industry 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.

Employers must prevent unauthorized entry into confined spaces. The best way to do this is to fully secure the entry portals with bolted connections. Other means to prevent unauthorized entry may be accomplished by posting danger signs or conducting confined space awareness training.

If employees are expected to enter permit spaces, the employer must develop a written permit space program and make it available to employees.

OSHA’s general industry regulation (29 CFR 1910.146, Permit-required confined spaces) specifically states this regulation does not apply to the construction industry due to the differences in the nature of the work sites.

However, contractors performing maintenance work at a host employer’s facility may be bound by law to comply with 29 CFR 1910.146. Examples of maintenance operations include cleaning, inspecting, repainting, and replacing components similar to the existing structure.

Construction operations consist of the reconfiguration or installation of substantially new equipment. If the work is considered construction, the general industry standards do not apply. Currently, OSHA has a proposed rule for confined spaces in construction. The final rule is expected to be released by the end of 2011.

## Detecting and Controlling Hazardous Conditions

Potential hazards in a confined space could be:

- A hazardous atmosphere, the most common threat
- Hazardous liquids or solid materials
- Thermal, mechanical, or electrical hazards
- Noise, slips, and trips
- Any situation in which self-rescue is not possible.

Permit-required confined space entry is not allowed until effective procedures are followed that will allow safe entry. The employer having control over the confined space operation must make sure effective means have been taken to prevent any unauthorized entry. Prior to entry, the entry supervisor is responsible for assessing the hazards and issuing a permit to ensure potential hazards are adequately controlled or eliminated.

Some examples of how to control or lessen potential hazards in a confined space include isolating the permit space by physically blanking or blinding lines to the space, purging and ventilating the space, and conducting atmospheric monitoring before and during entry.

Ventilation equipment should be grounded and bonded to avoid static discharges that might ignite flammable atmospheres. All mechanical, electrical, and stored sources of energy should be de-energized or rendered in a zero energy state and locked out/tagged out in accordance with the employer's lock out/tag out program. A standby attendant and a rescue plan must be in place for permit-space entry operations.

Employees must immediately leave the space if hazardous conditions are detected during entry. The employer must evaluate the space to determine the cause of the hazardous condition and modify the program as necessary. A new permit must be issued by the entry supervisor before work may resume inside the space.

Non-permit confined spaces must be evaluated when changes occur in their use or configuration, and where appropriate, must be reclassified as permit spaces. A space with no potential to have atmospheric hazards or other serious hazards may be classified as a non-permit confined space only when serious hazards are eliminated in accor-

### Safety Resources Online

The Web site of the National Ground Water Association has safety resources online at [www.ngwa.org/Professional-Resources/safety/Pages](http://www.ngwa.org/Professional-Resources/safety/Pages).

dance with OSHA's standard. If entry is required to eliminate hazards or obtain data, the employer must follow permit-required entry procedures until the employer is able to validate that the hazards are eliminated.

### Worker Training

Training is critical for confined space entry operations. The employer must provide proper training for all workers who are required to enter permit spaces before work begins. After the training, employers must be certain employees have acquired the understanding, knowledge, and skills necessary to safely perform their duties.

In addition, a standby attendant must be trained to remain outside permit spaces during entry operations. The standby attendant must maintain communication with and keep an accurate list of all those workers entering the permit space. The attendant is also responsible for ordering an evacuation of the permit space when a prohibited condition occurs, summoning rescue and other services during an emergency, and ensuring that unauthorized people stay away from the permit space.

An emergency rescue plan, along with the necessary rescue equipment, must be in place prior to entry into permit spaces. In an emergency, those workers entering shall be removed from a permit space in a timely manner—preferably within 4 minutes.

Rescue service personnel must be provided with personal protective and rescue equipment, including respirators, and training in how to use the equipment. Simulated practice rescue exercises should be performed at least once a year. Rescuers must also be informed of the hazards of the permit space.

In summary, the main difference between permit and non-permit confined space is that a permit space has serious recognized hazards, whereas such hazards are not present or have been eliminated for a non-permit confined space.

A permit space requires a permit, a rescue plan, rescue equipment readily

available, and a standby attendant. If the space had a hazardous atmosphere that has been effectively eliminated through isolation (blinding or blanking), cleaning, purging, and ventilation—and verified by atmosphere testing—the space may be reclassified as a non-permit space.

But even after reclassification, the atmosphere inside the non-permit space should be regularly monitored to verify that hazardous atmospheres remain effectively eliminated and that no hazardous atmosphere develops inside the space due to work activities performed by employees who enter the space. [WWJ](#)