



Training is the Foundation of Safety Operations in Confined Spaces



Problem Statement

Between 2011 and 2018, 1,030 workers suffered fatal injuries associated with confined spaces. The most frequent events associated with these fatalities resulted from the collapse of the trench or excavation (166), engulfment in collapsing material (86), and inhalation of a harmful substance (60).¹

In 2021, OSHA imposed two of the most significant fines on employers, \$676,808 to a grain facility and \$419,347 to a rail car service provider, involving fatalities in confined spaces. The grain facility incident resulted in the death of a 52-year-old manager, who was found after a nine-hour recovery effort by emergency responders. Emergency services were called after the manager was a no-show at a scheduled meeting.² Two workers lost their lives while cleaning a rail car when a worker entered the space without the required permit, without testing the atmosphere, and without a designated attendant. In line with numerous incidents involving multiple fatalities, the second worker was killed while trying to rescue the first, but not adhering to accepted protocols.

These are just a few examples of situations where organizations work in or around a confined space without the knowledge, skill, ability, or oversight required by federal safety standards. It is not only necessary that workers be provided the training and protective systems to work safely in confined spaces, but those responsible for the work be able to verify the capability of everyone involved in the operations.



What is a Confined Space?

In OSHA's General Industry Standard (1910.146) and Construction Standard (1926.1202), a confined space is a space that is: (1) large enough and so configured that an employee can bodily enter and perform assigned work; and (2) has limited or restricted means for entry or exit (for example, tanks, vessels, silos, storage bins, hoppers, vaults, and pits); and (3) not designed for continuous employee occupancy.³ While examples of the various types of confined spaces can be found across industries, the requirement for a permit is needed to enter a space that has one or more of the following characteristics:



Contains or has the potential to contain a hazardous atmosphere



Contains material that has the potential to engulf an entrant



Has walls that converge inward or floors that slope downward and taper into a smaller area which could trap or asphyxiate an entrant



Contains any other recognized safety or health hazard, such as unguarded machinery, exposed live wires, or heat

[1] U. S. Bureau of Labor Statistics. (2020). [Fact Sheet - Fatal occupational injuries involving confined spaces](#) - July 2020. Retrieved on April 24, 2022.

[2] Moyer, M. (2021). [Lives Lost, Workers Injured, Millions Spent](#). Retrieved April 24, 2022.

[3] [Occupational Safety and Health Administration. \(n.d.\) 910.146 - Permit-required confined spaces](#). Retrieved on April 24, 2022.

Training

Given the significant potential for serious injury, untrained or unsupervised workers should never be assigned work in or around a confined space. There are hazards associated with the confined space itself and the activities that may be performed in the space. It may be necessary to protect the space from potential collapse based on the configuration. The space may require ventilation, respiratory protection, or both depending on air monitoring results. The presence of hazardous energy, chemicals, or materials may require either removal or other control of the source. It is also critically important that attendants and supervisors be versed in the processes and systems associated with emergency rescue service, whether it is provided internally or externally to the organization.

The essential factor associated with safe operations in and around confined spaces is recognizing the hazard. While there are different roles relative to the space, responsibility for recognition is shared equally between the entrant, attendant, and supervisor; each of these functions has a vital part to play in the safety of everyone in and around the confined space. Training must be focused on the role that workers will play in or around the space.



Awareness



The first person who arrives at a confined space must be aware that the space meets the definition and then aware of the role that they will be serving. This awareness does not necessarily require this individual to understand every aspect of how the confined space should be addressed. However, they should know their limitations and how they interact with other roles. It is quite possible that a person serving the role of an entry supervisor may be aware of the hazards but not necessarily have a detailed understanding of how to operate in the hazardous environment.

Entrants



Operational knowledge is essential for the entrant and the attendant, given that these roles must enter or be adjacent to the hazard to accomplish work. Technical expertise is critical for the entrant, separate from the other roles. The entrant must be capable of entering the confined space and performing a body of work that may or may not have additional inherent hazards and risks.

Attendants/Supervisors



An individual with technical skills that would allow them to safely function can function as an attendant or a supervisor, assuming they are familiar with the non-safety-related essential functions of the role. Each role must possess additional safety-related skills to facilitate the safety of themselves and others in and around the space. These skills involve understanding what makes a permit necessary for confined space and the decisions that must be made to execute work in and around the confined space. Supervisors also must understand the importance of other safety-related training, including hazard communication, accident prevention signs & tags, fall protection, personal protective equipment, respiratory protection, hazardous energy control, power tools, medical services, and first aid.

Rescue Service



Where there are often assumptions regarding the capability of local first responder organizations, confined space is a specialty skill that not all organizations possess. This limitation can often be a factor for supervisors when determining how and when work involving confined space entry is performed. The capability of another organization does not absolve the employer from the responsibility of creating a safe and healthful workplace for their workers. This includes an understanding of the capability and capacity of local emergency services and sub-contractors that support the work of a primary organization or company.



Conclusion

The hazards associated with confined spaces are not biased regarding the harm that can result from exposure to risks associated with unmitigated hazards in and around a confined space. It is essential to provide training for all involved, including those who would serve as attendants, entrants, supervisors, rescuers, and safety officers. To be performed safely, operations in and around confined spaces must be done deliberately with a consistent focus on safety to be effective. The effort placed on safety in confined space operations will also result in more efficient and higher quality work, thus contributing to the ability of the organization to achieve its goals.

Veriforce partners with companies every day to create a safer workforce.

Contact safety@veriforce.com to learn more.

About the Author

David Daniels is a former Fire Chief and Technical Rescue Technician. They served on the committee that drafted the first American standard for technical rescue operations and training, including confined space rescue. After three decades as an active first responder, Chief Daniels completed a Ph.D. in Occupational Health and Safety and became a Certified Safety Director. Dr. Daniels is an inductee in the National Fire Heritage Center's Hall of Legends, Legacies, and Leaders and a recipient of the National Safety Council's highest honor, the Distinguished Service to Safety Award.