SAFETY BRIEF: **CONFINED SPACES**

Working in confined spaces is one of the most dangerous situations an employee can expect to work in. Confined spaces are often referred to as the "Silent Killer" due to the serious dangers associated with them. Danger is something we can generally see or hear. However, the dangers in confined spaces are silent and can be lethal. For example, entering a storage tank, sewer, or enclosed drain can be hazardous for anyone without the proper training, protocols, and tools to safely enter. Confined spaces present dangers not only to the employee working in them, but also to the rescue team that may have to enter the confined space. Each year, many workers are injured and killed while conducting work in confined spaces. According to the Occupational Health and Safety Administration (OSHA), an estimated 60% of confined space fatalities are those attempting to rescue others.

Case Study: Confined Space Rescue Too Late—Florida, 2017

After a worker entered a manhole to perform work and quickly became unresponsive, a fellow worker entered the manhole in a rescue attempt. When the second worker became unresponsive, a third worker entered the manhole and shortly after, became unresponsive. All three workers died in the manhole. Post-incident atmospheric testing in the manhole revealed lethal levels of hydrogen sulfide and carbon monoxide. Two other workers and a volunteer firefighter also were exposed to the toxic gases in the manhole during rescue attempts but were able to survive. OSHA citations for the employer included: no written hazard communication plan detailing the toxic chemicals and gases workers would be exposed to; no training to workers for confined spaces; no atmospheric testing of toxic gases; and no documentation on confined space entry permit.

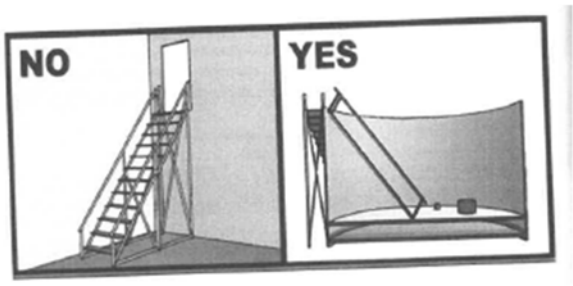
Could this have been prevented? *YES*

What is a Confined Space?

There are 3 elements that define a confined space:

1. A confined space is large enough, and so configured, that an employee can enter the space and perform work duties. This refers to a space that is large enough for full body entry. Smaller spaces that only allow for partial body entry rather than full body entry can contain serious hazards, but they are not treated as confined spaces.
2. Has limited or restricted means for entry and exit. This refers to anything that would make it difficult for the confined space worker to escape or leave the space in the event of an emergency.

3. Is not designed for continuous employee occupancy. This does not mean that the space is always occupied, but it does mean that it *could* be occupied under normal operating conditions.



Other types of confined spaces include, and are not limited to:

- Boilers
- Vessels and Tanks
- Storage bins
- Utility vaults
- Sumps and pits
- Excavations
- Sewers
- Attics and crawlspaces
- Lift stations
- Air handling units
- Cooling towers
- Tunnels and pipelines

Types of Confined Spaces

There are two types of confined spaces: Non-Permit and Permit-Required.

- "Non-Permit Confined Spaces" are spaces that do not contain or have the potential to contain any hazards capable of causing death or serious physical harm to workers in the space.

- "Permit-Required Confined Spaces" pose a more serious risk to workers' health because the space contains hazards such as a toxic atmosphere, engulfing materials (water, grain, dirt), inwardly converging walls (hopper), or other serious hazards. To qualify as a permit-required space, a confined space must have at least one of four characteristics:

    - Contains or has the potential to contain a hazardous atmosphere
    - Contains a material that could engulf or asphyxiate someone the entrant
    - Has an internal configuration that could cause a worker to become trapped or asphyxiated; spaces with inwardly converging walls or a floor that slopes downward
    - Contains any other recognized serious safety or health hazards

It is the employers' responsibility to design their own permits, and the content of the permit based on the types of hazards found in the employer's confined spaces as well as the specifics of the employer's confined space program.

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Hazards of Confined Spaces

Hazardous atmospheres are the biggest dangers that workers will face in permit-required confined spaces. A hazardous atmosphere can expose workers to the risk of death, injury, acute illness or incapacitation, or reduce their ability to escape from a permit-required confined space. Hazardous atmospheres can be caused by flammable or combustible materials in the air, too much or too little oxygen in the air, or chemical substances in the air.

Atmospheres that pose an immediate or delayed threat to life are classified as "immediately dangerous to life or health" (IDLH). These atmospheres are likely to cause permanent adverse health effects, or may interfere with an individual's ability to escape unaided from a confined space. Employees who work in IDLH atmospheres must receive detailed safety training for permit-required confined spaces, understand how to use and operate IDLH equipment and tools, and understand the procedures to prevent death and serious injury or illness. There must also be a trained rescuer on standby outside the confined space.

Another hazard of confined spaces are small entrances that can it make it difficult for rescuers with SCBA oxygen tanks to enter. Confined spaces have limited ventilation which can allow gases, vapors and fumes to accumulate in the space, creating hazardous atmospheres that normally wouldn't form in an adequately ventilated, open space. Even everyday household cleaning products can give off toxic deadly fumes in a confined space.

Workers may be exposed to fall hazards, and if so, fall protection must be provided and used in addition to complying with confined space requirements.

Finally, electrical equipment can cause electric shock or pull workers into machinery if it is not properly shut down before entry.

How to Prepare for Confined Space Entry

Non-permit confined spaces do not contain additional hazards such as the potential of a hazardous atmosphere or the potential for workers to become engulfed or trapped by materials. However, these non-permit confined spaces still require a comprehensive written safety plan and training. While signage is not required by OSHA, it is strongly recommended and workers should still exercise a great deal of caution!

Permit-required confined spaces require "Entry Permits" as written documents that are posted by all entrances to a confined space. The entry permit provides, in detail, who is allowed to enter the space, the atmospheric testing results, known hazards, control measures, emergency and rescue services, the date and duration of entry, acceptable entry conditions, communication procedures, special equipment or tools needed, and much more specific information relevant to the scope of work. The entry permit must be signed by the supervisor who authorizes entry and the person who conducts atmospheric testing. Before any work in a confined space begins, extensive atmospheric testing must be conducted to ensure that workers can safely enter the space. The atmospheric test results must be logged and kept on the posted entry permit outside of the

confined space, and the air must be continually monitored while workers are inside the space during the scope of work.

As with any initial work assignment, all workers who are exposed to confined spaces must be provided with training prior to conducting their work. The employer is responsible for training all workers who enter confined spaces and providing additional training when job duties change, or if the permit-required space presents a new hazard, or if a worker demonstrates signs of not understanding safety procedures. It's important to keep records of all training and to provide copies of training records if requested by authorized personnel.

Additional training is available through the AMLJIA Online University at www.amljia.org. Log on to the Online University for courses related on this topic such as "Confined Space Entry," "Fall Protection," and "Safety Awareness Program for Supervisors." For more information about the Online University, contact the AMLJIA at 800-337-3682.