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T4109

Enter with extreme caution

The best advice for entering a confined space is simple —don't do it — unless you absolutely must. And even then, there are procedures and knowledge that are essential in order to perform work safely.

Confined spaces can be killers, not only of those who have been working inside them but very often of those who attempt rescue when things go wrong.

By definition, a confined space is one that is either fully or partially enclosed, not designed primarily for human occupancy, and in which atmospheric and other hazards may occur because of its construction, location, contents, or the work being done.

Confined spaces can be above or below ground. Despite its name, a confined space is not necessarily small. Examples include silos, vats, hoppers, vaults, tanks, sewers, pipes, access shafts, truck or rail tank cars and aircraft wings. Ditches and trenches can also be confined spaces when there is limited access or egress.

Dangerous atmospheres are the most frequently mentioned hazards to be encountered in a confined space. These can be flammable, explosive, toxic, oxygen-deficient, or oxygen-enriched.

However, problems also can be presented by temperature extremes, rotating or moving equipment, reactive or corrosive residues, electricity, and uncontrolled movement of liquids or solids.

The first consideration with confined space entry is to determine if, in fact, the space is confined. Assuming that it is not confined can have fatal consequences.

A trained and experienced person should identify and evaluate all the potential hazards. If it fits the definition, a key question to ask right from the start is whether carrying out



work inside the confined space is necessary. There have been many deaths inside confined spaces when the work could have been done outside them.

The most important step in hazard assessment is testing the air quality. This is done from outside the space and throughout the whole area, from top to bottom and side to side.

Qualified personnel and properly calibrated gas detection equipment (smell or taste certainly won't always do) will determine that:

- The oxygen content is within safe limits (not too little and not too much).
- A dangerous atmosphere is not present (toxic, flammable)
- Ventilation equipment is working properly.

Results of this testing should be recorded on an entry permit, along with the equipment or methods used in the tests.

A confined space entry permit system helps identify not only the hazards and controls involved, but also who is inside the space.

If tests indicate a dangerous atmosphere, the space must not be entered until it is

thoroughly ventilated and subsequent tests indicate the air is safe to breathe.

Ventilation and testing must be continued as long as someone is in the space. If the space can't be ventilated adequately, it should only entered by those who:

- Wear suitable respiratory protection and a full body harness attached to a rope anchored outside the space and held by a worker with an alarm.
- Have a means of communication with the worker outside.
- Can be reached quickly by a person outside the space who is trained and equipped in artificial respiration and emergency rescue.

Here are some ways to control physical hazards of a confined space prior to entry:

- Isolate the space by disconnecting supply and drain lines. Lock out and tag the lines so they won't be reopened while work is being done inside.
- Inspect the space for contents such as grain or sand that could slide, shift, and bury whoever is inside.
- Lock out any electrical, hydraulic, or pneumatic equipment that could unexpectedly rotate, drop, roll, or snap shut in the space.
- Block and secure any equipment that could move because of gravity or stored momentum.

Whatever hazards are identified, there should be a rescue plan in place, and practiced, to make sure everyone knows what to do in an emergency.

The material contained in this document has been prepared from sources believed to be accurate and reliable. Application of this information to a specific worksite should be reviewed by a safety professional. Anyone making use of the information set forth herein does so at their own risk and assumes any and all liability arising therefrom. Specific medical advice should be obtained through consultation with a physician or other trained health care practitioner.