

## Confined Spaces in Construction: Hazards

### Handout

The old cliché “it is better to be safe than sorry,” was made for confined spaces. Yet workers continue to make the mistake of entering deadly confined spaces. It is pretty much a given that you can go to your local library any day of the week and find a newspaper reporting on the latest victim of a confined space accident.

What makes a confined or enclosed space hazardous? Hazards in confined spaces can be separated into two categories: physical hazards and atmospheric hazards.

**Physical Hazards**—are hazards that deal with mechanical, electrical, and hydraulic energy; being buried by some material; communication problems; noise; and entry and exit problems of the confined space.

Activated electrical or mechanical equipment can cause injury in a confined space and must be deenergized and locked-out before you enter the space. Dangers may also be present from cave-ins or water entering the space from construction operations or heavy rain.

Underground utilities also can present problems in confined spaces. All lines containing hazardous materials such as steam, gases, or coolants should be shut off.

**Atmospheric Hazards**—most confined space accidents are related to atmospheric conditions inside the space and the failure to continuously monitor the air and ventilate as necessary. Atmospheric hazards are usually broken down into three categories.

**Oxygen deficiency**—The primary risk associated with confined spaces is oxygen deficiency. Other atmospheric hazards are flammable and toxic air. Normal air contains 20.8 percent oxygen. The minimum safe level as indicated by OSHA is 19.5 percent. At 16 percent you will feel disoriented and between eight percent and 12 percent, you will generally become unconscious. If the air has too much oxygen (over 23.5 percent) it is considered oxygen rich and becomes an explosion or fire hazard.

**Flammable Air**—Fire and explosion are serious dangers in a confined space. Fumes and vapors will ignite more quickly in the trapped air. Flammable and combustible gases or vapors may be present from previous contents, tank coatings and preservatives, and welding gases. In locations where flammable vapors may be present, precautions must be taken to



prevent ignition by eliminating or controlling the source of ignition or eliminating the flammable air before working. Sources of ignition may include smoking, cutting and welding, hot surfaces, and frictional heat.

*Toxic Air Contaminants*—Toxic air contaminants come from material previously stored in the confined space or as a result of the use of coatings, cleaning solvents, or preservatives. The work being performed in a confined space could also give off a toxic gas. An example of this would be a welding operation that gives off carbon monoxide and oxides of nitrogen and ozone. Unfortunately, you will not see or smell most toxics, but they present two types of risk in a confined space: they can irritate your respiratory or nervous system; or some toxic chemicals can cut off your oxygen supply, get into your lungs and asphyxiate you.

