

## **Confined-space entries**

### **Initiative**

The purpose of this Minnesota OSHA Safety Hazard Alert is to heighten public awareness of the potential for death and/or serious injury when entering a confined space. This bulletin is intended to bring this hazard to the attention of employers, employees, MNOSHA, federal OSHA, Mine Safety and Health Administration (MSHA) and emergency response personnel, and alert all field investigators to this hazard so future inspections adequately address the confined-space entry hazard.

On March 1, 1999, MNOSHA adopted the revised federal OSHA standard 29 CFR 1910.146 Permit Required Confined Spaces for General Industry and moved Minnesota Rules 5205.1000 through 5205.1040 (Confined Spaces) to the standards for construction chapter, as 5207.0300 through 5207.0304.

### **Description of hazard**

Confined spaces may contain one or more atmospheric, physical or fire hazards. Some examples of confined spaces are chemical processing tanks and vats, fuel tanks, boilers, manure pits, sewers (including lift stations), hoppers, mixers and steam pipes. Oxygen deficiency is a common cause of death in confined spaces. Bacteria or a chemical reaction may consume oxygen, or a gas such as carbon dioxide or methane may displace oxygen in the confined space. Toxic gases such as hydrogen sulfide may be generated during decomposition of organic matter. Employees have died when caught by mixer blades or screw conveyors in confined spaces or when engulfed by materials such as grain, sand and other flowing materials. Fires and explosions have occurred when flammable vapors or gases have entered confined spaces.

### **Controlling the hazard**

The written confined-space entry permit will identify the hazards of the confined space, ventilation requirements, air monitoring requirements and rescue procedures. Mechanical ventilation is used to introduce fresh air into the confined space before and during entry to control, but not eliminate, potential hazardous atmospheres. The end of the ventilation hose should be directed at a wall in the confined space to enhance mixing of the air. Minimum ventilation rates are determined by the size and configuration of the confined space and the number of occupants. Air monitoring should always begin with oxygen monitoring. If there is not enough oxygen, the other sensor cells in the air monitor will not give accurate readings. Monitoring should then continue with flammable gases and vapors and then toxic air contaminants.

Timely rescue, defined as three to four minutes, is crucial to a victim who collapses in a confined space. Rescue personnel, including the standby person, should not attempt to enter a confined space unless they have been trained, have been provided with supplied air respirators approved for atmospheres "immediately dangerous to life or health" (IDLH) and have notified the local emergency responders. More than half of the confined-space fatalities are unprepared, would-be rescuers.

Harnesses and retrieval devices can be used to rescue confined-space victims without other personnel entering the confined space. Off-site rescue services should be provided with information regarding the potential hazards of the confined space and should be allowed to practice a rescue from the space as often as necessary to prove proficiency.

**For more information**

Employers and employees with questions and concerns about this hazard may consult 29 CFR 1910.146 and Minnesota Rules 5207.0300 through 5207.0304 or call MNOSHA Compliance at (651) 284-5050 or toll-free at 1-877-470-6742.

**Acknowledgments**

The principal contributors to this Minnesota OSHA Safety Hazard Alert were Terry Osterbauer, senior industrial hygienist, and Jolyn Crum, industrial hygienist.