CONFINED SPACES – HAZARDOUS ATMOSPHERES

IDENTIFY

Dangerous atmospheres have killed those working in confined spaces as well as those attempting rescue. Know the hazards before you enter.

A "**hazardous confined space**" means a confined space that is or may become hazardous to a worker who enters or is in the space for one or more of the following reasons:

- The design, construction, or atmosphere of the space.
- Materials or substances in the space.
- The work activities or processes in the space.
- Any other conditions within or related to the space.

Under Part 15 of the Workplace Safety and Health (WSH) Regulation, there are specific requirements that must be met before work can begin in a hazardous confined space.

15.5 – Before requiring or permitting a worker to enter or work in a hazardous confined space, an employer must:

a) Ensure that the worker entering the space wears a full-body harness attached to a lifeline that is attached to a personal hoisting device, unless an alternate safe method of access and egress is provided from all accessible parts of the space.

b) Identify and take measures to ensure that a worker will not be exposed to the risk of drowning or becoming engulfed or entrapped in any liquid or free-flowing solid that may be present in the space.

c) Identify and take measures to ensure that all energy sources that present a hazard to a worker entering, occupying, or leaving the space have been locked out, and the energy sources have been put in a zero energy state.

d) Identify emergency and personal protective equipment required by a worker who undertakes rescue operations in the event of an accident or other emergency within the space and ensure that equipment is at the site of the space.

e) Establish and implement an entry permit system for the space, in accordance with WSH Regulation Section 15.6.

COMMUNICATE AND CONTROL

The following are dangerous types of atmospheres:

- Flammable and explosive
- Toxic
- Oxygen-deficient
- Oxygen-enriched

Flammable and explosive atmospheres include:

- Natural gas from leaking gas lines or natural sources
- Methane from decaying sewage
- Propane gas from leaking cylinders or equipment
- Gasoline vapour from leaking tanks and spills
- Vapour from solvents used for painting, cleaning, refinishing, etc.

Toxic atmospheres include

- Solvent vapour
- Hydrogen sulfide from decaying sewage or raw petroleum
- Carbon monoxide from engine exhaust

Oxygen-deficient atmospheres contain less than 19.5 per cent oxygen. Breathing oxygen-deficient air can make you lose judgment, coordination, and consciousness. In a confined space, oxygen can be displaced by other gases or used up by rusting metal, combustion, or bacteria-digesting sewage.

Oxygen-enriched atmospheres contain more than 23 per cent oxygen. They are rare in construction and are usually caused by leaking oxygen hoses or cylinders.

You must check for atmospheric hazards before entering any confined space. You must use properly calibrated gas detection equipment. Many dangerous atmospheres cannot be detected by smell or taste.

Make sure the equipment is able to detect what you suspect. Some detectors have sensors that check for oxygen content, explosive gases or vapours, and a range of toxic gases. Some have only one or two sensors and may not detect certain types of hazards. You may need a selection of detectors — one detector can't test for everything.

COMMUNICATE AND CONTROL

Check all levels of the space. Some contaminants are lighter than air and accumulate near the top of the space. Others are heavier than air and settle at the bottom.

If you leave the space for a break or lunch, test before you go back in. Dangerous atmospheres can develop without warning.

If tests indicate a dangerous atmosphere, you must NOT enter the space until it is thoroughly ventilated, and subsequent tests indicate the air is safe to breathe.

Ventilation and testing must be continued as long as you are in the space.

If the space can't be adequately ventilated, you can only enter if you adhere to the following:

- 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.
- Ensure a person trained and equipped in artificial respiration and emergency rescue is available outside the space.

Never try to rescue a worker overcome in a confined space unless you are trained and equipped for it. Many workers trying to save their co-workers have become victims themselves. Get emergency help as outlined on the entry permit.

ANSWERS:

1. Design or construction of the space, materials, work activities, and/or other conditions; **2.** TRUE; **3.** Flammable, toxic, oxygen-deficient, and/or oxygen-enriched; **4.** Natural gas, methane, propane, gasoline; **5.** Carbon monoxide, hydrogen-sulfide; **6.** a; **7.** b; **8.** Suitable respiratory equipment, means of communication, and trained and equipped in emergency rescue; **9.** TRUE

THE QUIZ

1. What are two reasons a confined space might be deemed hazardous?
   a) _____
   b) _____

2. When entering a hazardous confined space you must wear a full body harness:
   TRUE_____ FALSE_____

3. List two types of dangerous atmospheres:
   a) _____
   b) _____

4. List two flammable and explosive type atmospheres:
   a) _____
   b) _____

5. List two toxic types of atmospheres:
   a) _____
   b) _____

6. Oxygen-deficient atmospheres contain less than:
   a) 19.5 per cent
   b) 20 per cent
   c) 18 per cent

7. Oxygen-enriched atmospheres contain more than:
   a) 25.5 per cent
   b) 23 per cent
   c) 21 per cent

8. If the space can't be adequately ventilated, you can only enter if:
   a) _____
   b) _____
   c) _____

9. An entry permit system is required to enter a hazardous confined space:
   TRUE_____ FALSE_____