Centurion Safety Education

MONTHLY REFRESHER TRAINING
PERMIT REQURIED CONFINED SPACES

February Week 1

Sewer Manhole Asphyxiation
Date: April 1994
Location: Ohio

A municipal worker entered a sewer manhole to retrieve equipment. The atmosphere inside the manhole was oxygendeficient. There was no permit, no atmospheric testing, and no attendant. The worker collapsed shortly after entry and died.

This incident shows what happens when a worker does not stop to ask whether a space is a confined space before entry. The manhole met all criteria of a permit-required confined space, but it was treated as a routine task instead of a hazardous entry. When workers do not question the space, hazards are never identified, and no controls are put in place.

Before any part of your body crosses an opening, ask yourself:
- Is this space enclosed or partially enclosed?
- Does it have limited entry or exit?
- Is it not designed for continuous occupancy?

If the answer is yes to these questions, stop and get the space evaluated. Do not enter until the space has been reviewed and controlled.

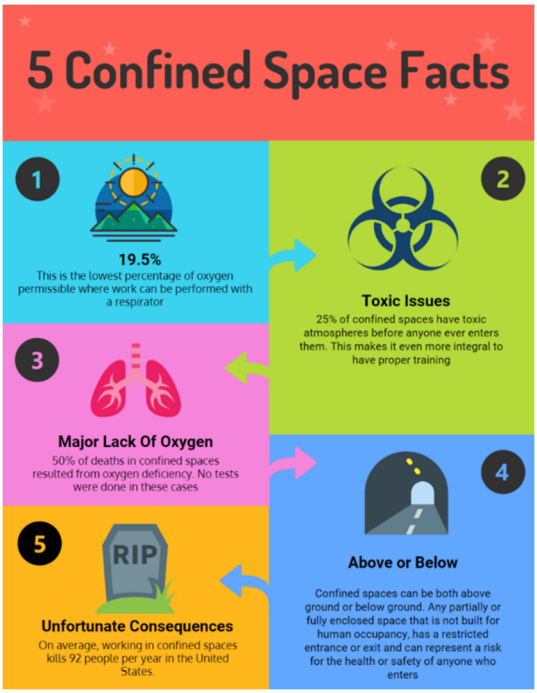
If you don't ask the question, you can't get the protection. Every confined space incident starts with a missed pause.

WHAT IS A CONFINED SPACE?

A confined space is any enclosed space with restricted entry or exit that is not designed or intended for continuous human occupancy. The word 'confined' may suggest 'small', but not all confined spaces are. Some examples of confined spaces include tanks, access shafts, utility vaults, sewers, silos and storage bins. Ditches and trenches may also be a confined space when access or egress is limited. Some of the defining features of a confined space include:

- It is not primarily designed or intended for humans except for the purpose of work.
- It is enclosed or partially enclosed.
- It has a restricted means of entrance and exit by way of location, size or means.
- It has poor natural ventilation or hazardous atmosphere.
- It may become hazardous due to design, materials or substances inside, or the work/activities being carried out inside.

WHAT ARE THE RISKS? Many confined spaces contain hazardous substances or dangerous conditions. Hazards and threats could include:



- Poor Air Quality - Atmospheres with an oxygen content less than 19.5% (deficient) or more than 23% (enriched) are not safe.
- Toxic Gasses - Hydrogen sulfide, carbon dioxide, carbon monoxide, ammonia, chlorine, are all potentially deadly.
- Flammable Atmospheres - A highly explosive atmosphere can be created when finely ground combustible materials such as grain, carbon, cellulose, fibers, plastics or flammable liquids are present.
- Mechanical, Electrical or Physical Hazards - Examples include moving parts, structural hazards, noise, temperature and visibility.
- Loose Materials that may Engulf or Smother - Shifting or collapse of bulk material, barrier failures, etc.

WHAT CAN WE DO TO PROTECT OURSELVES?

The dangers and risks associated with confined spaces are not always obvious.

All hazards must be identified and either eliminated prior to entry, or all precautions are taken for the safety of the person entering the confined space. Before entering any confined space:

- Do not enter permit-required confined spaces without being trained and without having a permit to enter.
- Review, understand and follow employer's procedures before entering permit-required confined spaces and know how and when to exit.
- Before entry, identify any physical hazards.
- Before and during entry, test and monitor for oxygen content, flammability, toxicity or explosive hazards as necessary.
- Use employer's fall protection, rescue, air-monitoring, ventilation, lighting and communication equipment according to entry procedures.
- Always maintain contact with a trained attendant either visually, via phone, or by two-way radio. This monitoring system enables the attendant and entry supervisor to order you to evacuate and to alert appropriately trained rescue personnel to rescue entrants when needed.

Above all else, ensure that all personnel involved in the confined space process are competent to do the job safely. Many workers are injured and killed each year while working in confined spaces. An estimated 60% of the fatalities have been among the would-be rescuers. Unless you are trained in confined space hazards and how to control them, never enter a confined space.

Every confined space has unique hazards that need to be controlled before they can be entered.

Centurion Safety Education

MONTHLY REFRESHER TRAINING
PERMIT REQUIRED CONFINED SPACES DESIGNATED ROLES

February Week 2

CONFINED SPACE ROLES

AUTHORIZED ENTRANT

The entrant is the actual person that will enter the confined space to complete a task.

ATTENDANT

The Attendant remains outside the confined space monitoring the safety of the Entrant.

ENTRY SUPERVISOR

Determines acceptable safe entry conditions. The Entry Supervisor both authorizes and terminates entry into confined spaces.

RESCUE PERSONNEL

The personnel designated to rescue employees from confined spaces.

CONFINED SPACES DESIGNATED ROLES

A confined Space team will consist of:

1. Authorized Entrants
2. Attendants
3. Entry Supervisors
4. Rescue/Emergency personnel

AUTHORIZED ENTRANT

The entrant is the employee entering the confined space to complete a work task.

Entry is defined as any part of the human body crossing the entrance threshold into the confined space. This may include a hand, a leg, the head, or the entire body.

While other members of the task team may be exposed to injury during a rescue attempt, the entrant is the primary team member at risk.

It is important, and required, that the entrant be fully educated on the environment in which the work will be done, as well as on his responsibilities as the entrant.

OSHA-recognized responsibilities of the entrant are:

• Wear personal protection equipment (PPE) appropriate for the work procedure as well as to address any safety hazards in the confined space.

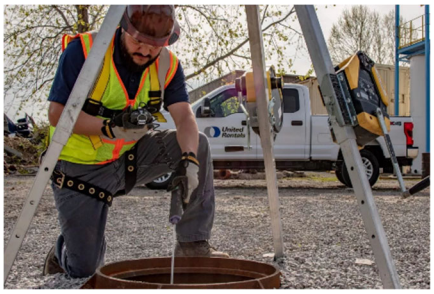
• The status of the entrant will be monitored by an attendant. It is required of the entrant to maintain all necessary communication that will inform the attendant of his or her status.

• Recognize signs and symptoms of an impending potential injury. Having detailed knowledge of the hazards involved with a given confined space will allow the entrant to anticipate and respond to the onset of injury.

• Understand and recognize fail-safe alarms and notifications that would indicate the need to evacuate.

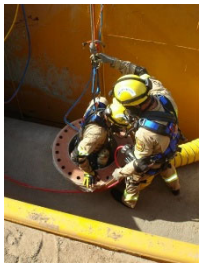
• Evacuate immediately in the event of an emergency, or should the attendant or supervisor issue an order of evacuation.

ATTENDANT



OSHA defines "the attendant" as the employee who will remain outside of one or more confined spaces and monitor the conditions of the entrants.
The attendant will be fully informed on and trained in all procedures and potential hazards outlined in the permit.

Should the confined space require a permit, the permit will list and clarify the authorized methods of communication by which the attendant will remain in contact with the entrant.



The attendant will remain outside of the confined space, prepared to give the order to evacuate should an emergency arise, and to engage rescue procedures or contact rescue personnel should the entrant be unable to evacuate.

Monitor activity within and outside of the confined space. You should be vigilant in recognizing the onset of a hazardous situation whether it manifests inside or out.

It is also the attendant's responsibility to keep unauthorized employees away from the confined space. If more than one entrant is involved in the procedure, the attendant will keep a steady head count in order to monitor entrants entering and exiting, and to have a consistent count of entrants within the space.

If an unauthorized employee enters the confined space, the attendant must order them to leave immediately and notify the entrant(s) and supervisor of the breach.

As the attendant, monitoring the situation and environment within the confined space and its entrant is your sole and primary responsibility. You are not allowed to perform other tasks which will inhibit your ability to monitor and protect the entrant.

ENTRY SUPERVISOR

Are responsible for determining acceptable entry conditions. The entry supervisor must:

- Verify acceptable entry conditions are present prior to entry.
- Verify entry permit has been completed and is correct.
- Verify all tests required by permit have been conducted.
- Verify all procedures and equipment specified by permit are in place.
- Verify rescue service is in place.
- Authorizes and Terminates entry permit as required.

RESPONSIBILITIES OF ALL

Everyone involved with confined space work must:

- Know the potential hazards of the confined space entry.
- Signs, symptoms, and consequences of exposure to the hazard.
- Possible behavioral effects from exposure.
- Know how to use the PPE for entry and the
- Monitor activities inside and outside the space related to entry.

limitations of the PPE.

- Exit space immediately at any sign of a prohibited condition or evacuation order.
- Keep unauthorized people out and away from the confined space.

PREVENT CONFINED SPACE INJURIES

- Treat ALL confined spaces as hazardous.
- NEVER enter until air is tested and safe.
- Have safe and dependable communication between entrant and attendant.
- Know how to use all safety equipment required for entry.

OSHA Case Reference:
Municipal Sewer Lift Station Fatality
Date: May 16, 2017
Location: Key Largo, Florida

Two municipal workers were assigned to work at a sewer lift station, a permit-required confined space. One worker entered the space and was overcome by a toxic, oxygen-deficient atmosphere. A second worker entered the space to rescue him. Both workers collapsed and died.

This case shows why confined space roles must be assigned and enforced before entry. There was no continuous attendant monitoring the entrant and no one controlling access to the space.

The attendant's role is to prevent unsafe entry and coordinate emergency response. They are not to enter the space.

This case demonstrates why entrant, attendant, and supervisor roles must be established and enforced before entry.

Centurion Safety Education

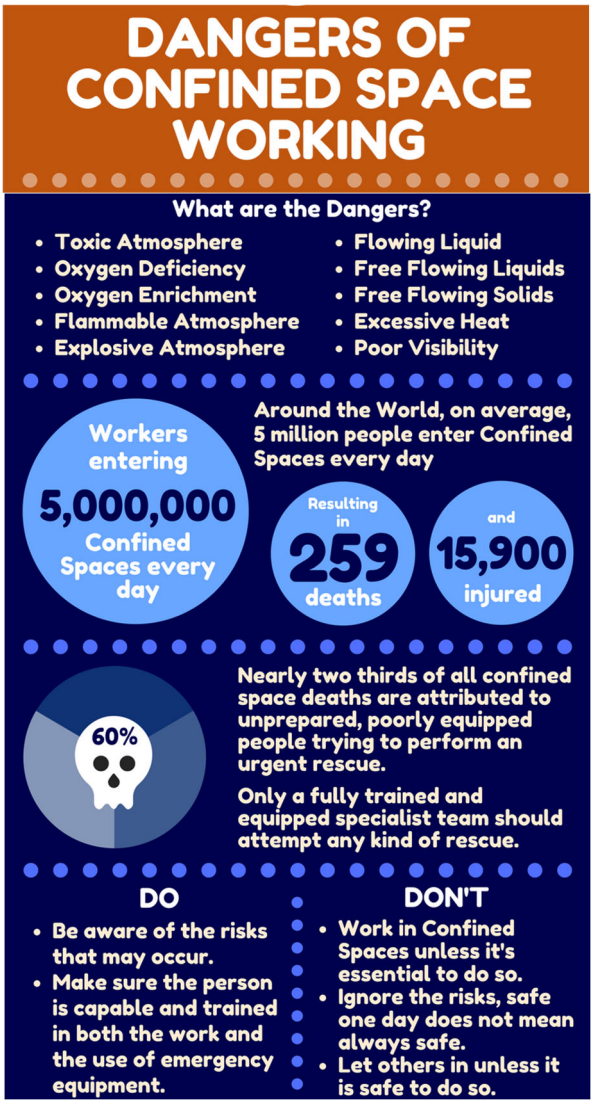
MONTHLY REFRESHER TRAINING
PERMIT REQUIRED CONFINED SPACES HAZARDS

February Week 3

CONFINED SPACES DANGEROUS AIR

Dangerous atmospheres have killed those working in confined spaces as well as those attempting rescue. Dangerous types of atmospheres include

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



FLAMMABLE AND EXPLOSIVE ATMOSPHERS

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

TOXIC ATMOSPHERES

- Vapor from solvents
- Hydrogen sulfide from sewage or raw petroleum
- Carbon monoxide from engine exhaust.

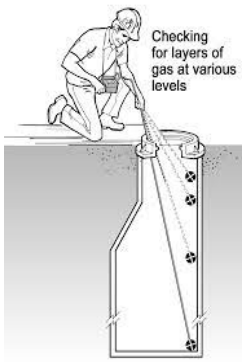
OXYGEN-DEFICIENT ATMOSPHERES

Contain less than 19.5% oxygen.

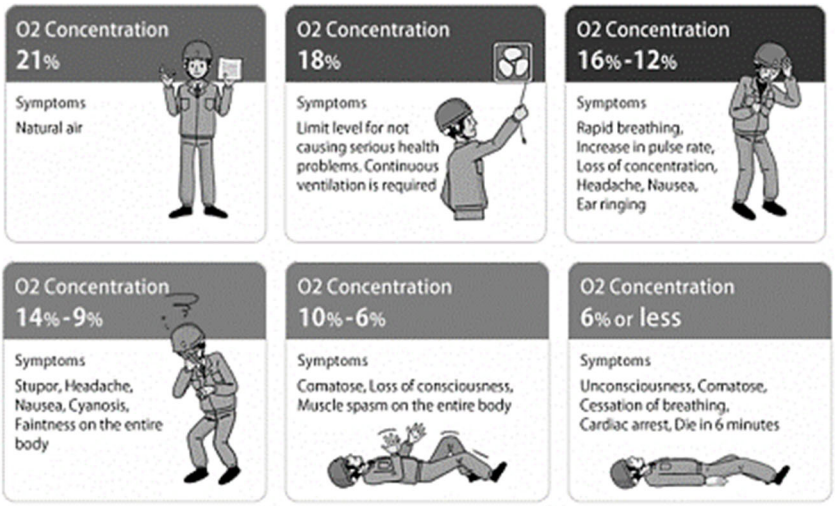
Breathing oxygen-deficient air can make you lose judgment, coordination, and consciousness. In a confined space, oxygen can be displaced by other gases or used up by rusting metal, combustion, or bacteria digesting sewage

CONTROLLING ATMOSPHERE HAZARDS

Check for atmospheric hazards before entering any confined space. 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 vapors, 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.



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.

CONFINED SPACE PHYSICAL HAZARDS

In addition to dangerous atmospheres, confined spaces such as tanks, vats, vessels, hoppers, and bins can present physical hazards such as

• Poor entry and exit • Cramped working conditions

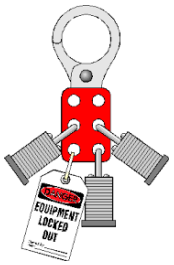
• Temperature extremes • Rotating or moving equipment

• Reactive or corrosive residues

• Electrical hazards

• Uncontrolled movement of liquids or solids.

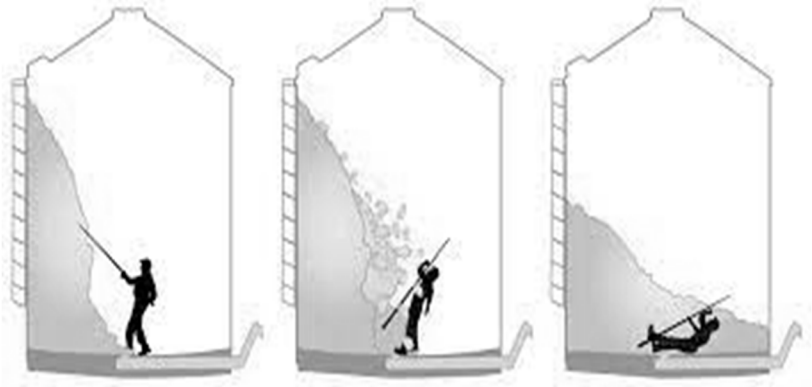
Some of these hazards involve greater risk inside a confined space than outside. For example, fire in a confined space can be far more dangerous than fire in an open work area.



CONTROLLING AND ELIMINATING PHYSICAL HAZARDS

Physical hazards in Confined Spaces must be made safe.

• Isolate the space by disconnecting supply and drain lines. Lock out and tag the lines so they won't be reopened while you're working inside.
• Inspect the space for dangerous contents such as grain or sand that could slide, shift, and bury you 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.
• Wear safety harnesses and lifelines to make rescue more efficient in case of an emergency.
• Use an entry permit system. This helps identify hazards and controls, and keeps track of who is inside.



Centurion Safety Education

MONTHLY REFRESHER TRAINING
CONFINED SPACE PERMITS

February Week 4

The Entry Permit

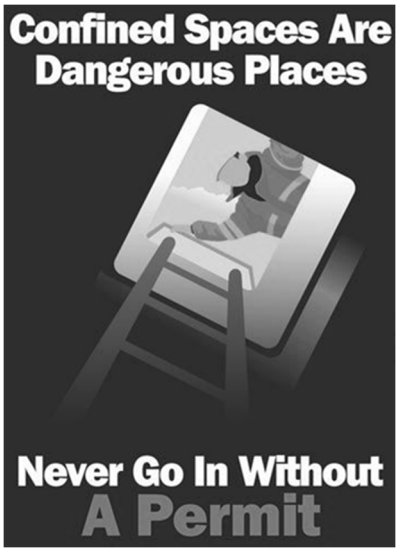
The confined space entry permit is the most essential tool for assuring safety during entry in confined spaces.

The entry permit process guides the supervisor and workers through a systematic evaluation of the space to be entered. The permit is used to establish appropriate conditions. Before each entry into a confined space, an entry permit will be completed.

The entry supervisor will then communicate the contents of the permit to all employees involved in the operation and post the permit conspicuously near the confined space entry point.

Elements of Entry Permits
A standard entry permit shall contain the following items:

- Name of confined space,
- Purpose of entry,
- Date and authorized duration of the entry permit,
- Name of authorized entrants within the permit space,
- Names of Entrants, Attendants, Entry Supervisor,
- Hazards of the permit space to be entered,
- Measures used to isolate the permit space and to, eliminate or control permit space hazards,
- What are the acceptable entry conditions,
- Results of initial and periodic tests performed



Rescue and emergency services that can be summoned, and the means of contacting those services (i.e., equipment to use, phone numbers to call)

Communication procedures used by authorized entrants and Attendant(s) to maintain contact during the entry

Equipment to be provided for compliance with this Confined Space Program (i.e., PPE, testing, communications, alarm systems, and rescue)

Other information necessary for the circumstances of the particular confined space that will help ensure employee safety

Additional permits, such as for hot work, that has been issued to authorize work on the permit space

Permit Scope & Duration

A permit is only valid for one shift. For a permit to be renewed, the following conditions shall be met before each reentry into the confined space:

1. Atmospheric testing shall be conducted, and the results should be within acceptable limits. If atmospheric test results are not within acceptable limits, precautions to protect entrants against the hazards should be addressed on the permit and should be in place.
2. *V*erify that all precautions and other measures called for on the permit are still in effect.
3. Only operations or work originally approved on the permit shall be conducted in the confined space.

A new permit is needed whenever changing work conditions or work activities introduce new hazards into the confined space. Canceled entry permit for at least one (1) year. Any problems encountered during an entry operation shall be noted on the respective permit.

Prospect Valley Dairy Confined Space Fatalities
Date: August 20, 2024
Location: Weld County (near Keenesburg), Colorado

At a dairy facility in Colorado, multiple individuals entered a confined space where hydrogen sulfide gas was present. Public reports indicate the individuals were members of the same family. When one person collapsed inside the space, others entered in an attempt to help. Six people died from toxic gas exposure. OSHA is investigating the incident.

This incident highlights the emotional reality of confined space emergencies. When someone collapses, (especially a family member) instinct, urgency, and emotion take over. In those moments, people act to help without stopping to evaluate hazards. This is how confined space incidents escalate into multiple fatalities.

The entry permit exists to remove emotion from the decision-making process. A permit forces hazard evaluation, role assignment, atmospheric testing, and rescue planning before anyone enters. It establishes who may enter, who must stay out, and how emergencies are handled—even when emotions are high.

The permit exists to protect us when emotion overrides judgment. We know the statistics. We know the risks. The permit ensures we act on that knowledge even in the hardest moments.