



# 26<sup>th</sup> Annual CIHC Professional Development Seminar

## Confined Space: Construction Requirements

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*December 9, 2016*

# Confined Space: Construction Requirements

## Federal OSHA

### **Subpart AA—Confined Spaces in Construction**

#### **Sections 1926.1201 to 1926.1213**

**Effective Date: August 3, 2015**

# Confined Space: Construction Requirements

## Cal/OSHA (Horcher Rule)

**Subchapter 4. Construction Safety Orders Article 37.  
Confined Spaces in Construction (Refs & Annos)**

**Sections 1950 – 1962**

**Effective Date: December 30, 2015**

# Learning Objectives

- Requirements of the new California Confined Space Regulation for Construction
- Important definitions
- Ideas on how to implement the required provisions
- What you can and cannot do
- Requirements of rescue operations
- Permit program requirements

# Scope

This regulation applies to any construction workers that are engaged in construction activities at a worksite with one or more confined spaces.

# Construction Safety Orders

Regulate the construction, alteration, painting, repairing, construction maintenance, renovation, removal or wrecking of all fixed structures or its parts.

Building a new structure or upgrading an old one is construction.

# Exceptions?

This standard only applies to construction. **Does not apply** to construction work regulated by:

- Construction Safety Orders, Article 6, Excavations
- Tunnel Safety Orders.
- General Industry Safety Orders, Group 26, Diving Operations.
- General Industry Safety Orders, Article 154, Pressurized Worksite Operations

What about the General Industry Safety Orders?

Where this standard applies, and there is another applicable Cal/OSHA standard, the employer must comply with both standards.



# Important Definitions

*You should know these backward and forwards!*

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*Acceptable Entry Conditions* – Conditions that must exist in a permit space, before an employee may enter that space, to ensure that employees can safely enter into, and safely work within, the space.

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*Barrier* – Physical obstruction that blocks or limits access

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*Blanking, Blinding* – The absolute closure of a pipe, line or duct by a solid plate that completely covers the bore and can withstand the maximum pressure without leaking

# Important Definitions

*You should know these backward and forwards!*



## *Confined Space -*

- *Large enough and so configured that a employee can bodily enter*
- *Has limited or restricted means for entry and exit*
- *Is not designed for continuous employee occupancy*



# What is limited or restricted?

- Configuration that can impede movement in or out of the confined space
- Conditions that include trip hazards, poor illumination, slippery floors, inclining surfaces and ladders
- Need to use ladder or movable stairs, or narrow or twisted stairs
- Difficult to open door or doorway that is too small to exit while walking upright
- Obstructions (pipes, conduits, ducts, etc.) that a worker would need to crawl over, under or squeeze around

# Important Definitions

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*Non-permit confined space* - A confined space that meets the definition of a confined space but does not meet the requirements for a permit-required confined space.

# Important Definitions

*Permit  
Required  
Confined  
Space - Has  
one or more of  
the following:*

- Contains or **has potential** to contain a hazardous atmosphere
- Contains a material that has the potential for engulfing an entrant
- Has an internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls or by a floor which slopes downward and tapers to a smaller cross-section
- Contains any other recognized serious safety or health hazard

# Important Definitions

*You should know these backward and forwards!*

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**Control** – Action taken to reduce the level of any hazard inside a confined space using engineering methods; then using these methods to maintain the reduced hazard level. PPE is not a control.

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**Controlling Contractor** - Employer that has overall responsibility for construction at the worksite.

# Entry Definitions

*These are very important!*

*Entry* – Any part of a person passes through an opening into a permit-required confined space. Entry includes ensuing work activities in that space and is considered to have occurred as soon as **any part** of the entrant's body breaks the plane of an opening into the space, whether or not such action is intentional or how many work activities are actually performed.

# Entry Definitions

*These are very important!*

**Entry Employer** – Any employer who decides that an employee it directs will enter a permit space

Note: An employer cannot avoid the duties of the standard by **refusing to decide** whether its employees will enter a permit space.

Cal/OSHA will consider the failure to decide to be an implicit decision to allow employees to enter those spaces if they are working in the proximity of the space.



# Entry Definitions

*These are very important!*

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*Entry Rescue – A rescue service enters a permit space to rescue one or more employees*

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*Entry Supervisor – Qualified person that determines acceptable entry conditions, authorizes entry, oversees operations and terminates entry*

# Entry Supervisor

*This person can do other duties as well*

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Entry Supervisors **may also be an attendant or entrant** as long as they are trained and equipped.

Supervisor duties may also be passed from one person to another during the course of an entry operation.

# Hazardous Atmosphere

*Hazardous Atmosphere* – Atmosphere that exposes employees to risk of death, incapacitation, impairment to self rescue, injury and acute illness.

Flammable Gas, vapor or mist > 10% LEL

Combustible dust

Oxygen <19.5% or >23.5%

Hazardous chemicals, gases

## What atmospheres could affect your workers?

- Oxygen?
- Flammable?
- Dusts?
- Toxic gases, vapors or mists?



# Airborne Combustible Dust

*Please note what OSHA says....*

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The concentration of airborne combustible dust may be approximated as a condition in which the combustible dust obscured vision at a distance of 5 feet or less.

# Combustible Dust

*What do you think?*

Would this  
be  
considered  
a  
combustible  
dust  
hazard?



# Host Employer

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*This is important!*

The employer that owns or manages the property where the construction work takes place.

# Host Employer

## *Important Note about the host employer*

If the owner of the property has contracted with an entity for the general management of that property, and has transferred to that entity the information specified in §1952(h)(1), Cal/OSHA will treat the contracted management entity as the host employer for as long as that entity manages the property. Otherwise, Cal/OSHA will treat the owner of the property as the host employer. In no case will there be more than one host employer.

*What does the host employer need to provide?*


Before entry operations begin, the host employer must provide the following information, if it has it, to the controlling contractor:

- Location of each known permit space
- Hazards or potential hazards in each space or the reason it is a permit space; and
- Any precautions that the host employer or any previous controlling contractor or entry employer implemented for the protection of employees



# General Requirements (Assessment)

*Before work begins.....*



A competent person must identify all confined spaces in which one or more of the employees directed may work.

Each permit space must be identified through consideration and evaluation of the elements of that space, including testing as necessary.

# What do you do if you identify Permit Spaces?

*If one or more permit spaces is identified you must*

Inform exposed employees by:

- Posting “Danger” Signs
- Other “Equally Effective Means”



# What do you do if you identify Permit Spaces?

*If one or more permit spaces is identified you must*



Inform in a timely manner, and manner other than posting, employees authorized representatives and the **controlling contractor** of the existence and location of, and the danger posed by, each permit space.

# What do you do if you identify Permit Spaces?

*What if you don't want employees to enter it?*



Effective measures must be taken to prevent employees from entering a permit space. These measures must comply with all applicable regulatory requirements of the standard.

What do I do if I need my employees to enter a confined space?

You must have a written program that complies with §1953 Permit-Required Confined Space Program

The program must be available prior to and during entry operations for employees and authorized representatives

# Entry Conditions

*If the previously discussed conditions are met, you may then enter provided:*

Conditions  
making it unsafe  
to remove a  
cover must be  
eliminated prior  
to removing the  
cover

# Entry Conditions

*If the previously discussed conditions are met, you may then enter provided:*

Opening must be immediately guarded by

- Railing
- Temporary cover
- Other temporary barrier

Must prevent

- Falls into space
- Foreign objects falling into space



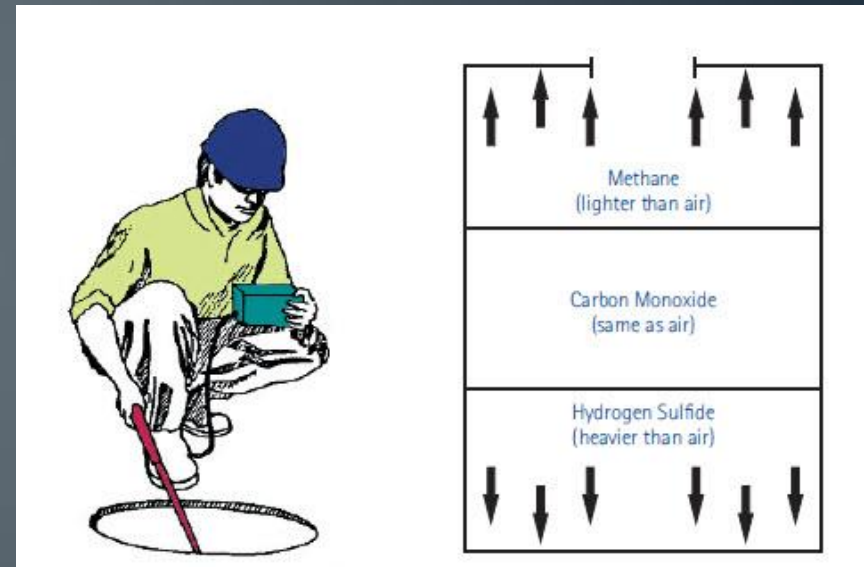
# Entry Conditions

## Air Testing

### Direct Reading for

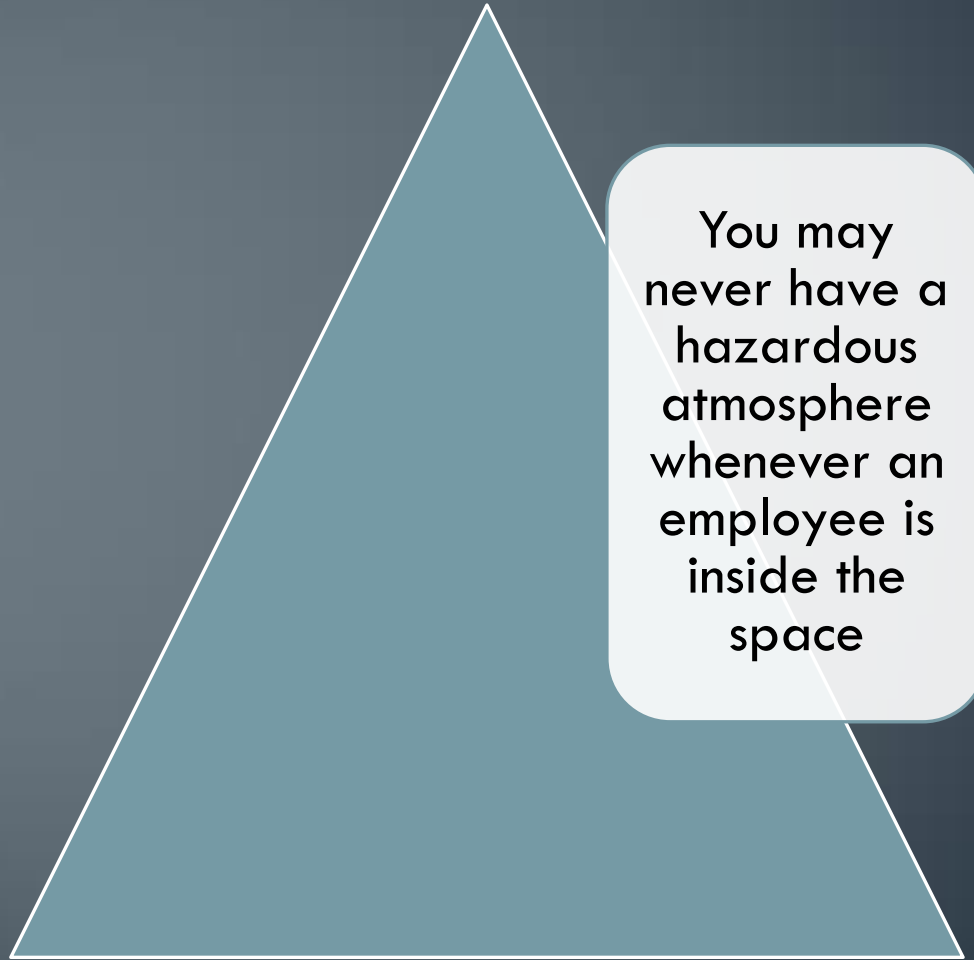
- Oxygen
- Flammable gasses/vapors
- Toxic contaminants

Entrants must be allowed to observe testing





# Hazardous Atmospheres



# Forced Air Ventilation

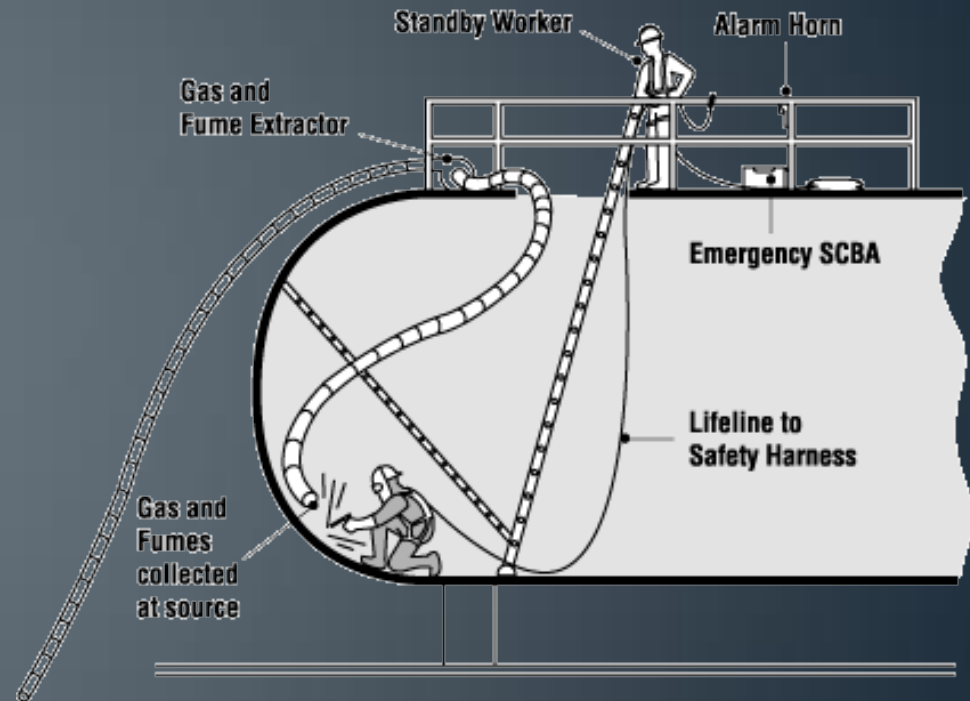
*Continuous forced air ventilation must be used*

Hazardous atmosphere must be eliminated

Directed to ventilate the immediate work area of the employees in the space

Continue until employees have left the space

Provided from a clean source



# Air Monitoring



## Continuous Monitoring

- Alarmed
- Check frequently
- Ensure ventilation works
- Warn of accumulation of hazards

# Hazard Detected?

Each employee must leave the space

Investigate how the hazard developed

Measures must be implemented to protect employees from the hazard prior to anymore entries

# Entering & Exiting

Hoisting system must be designed and manufactured for personnel hoisting

Job-made allowed if approved by PE in writing



# Space Safety Verification

*Employer must verify, in writing, that all of the previously discussed steps have been taken.*

## Certification must contain

- Date
- Location of the space
- Signature of person providing certification

Made prior to entry

Available for each entry employees

## Changes to the Space

Space must be reevaluated by a competent person if

- Changes in use or configuration increase hazards
- Initial evaluation was not adequate

May then need to be classified as a Permit Required Confined Space


# Alternate Entry Procedures

*If all of the following conditions are met, you may use alternate procedures*

All physical hazards are eliminated or isolated through engineering controls so that the only hazard is atmospheric



Continuous forced air ventilation alone is sufficient to maintain the permit space as safe for entry, and if the system stops, employees can exit the space safely



Monitoring and inspection data supports the assessment

All data must be documented and made available to employees who enter the permit space or to the authorized representative.



## Reclassification from Permit to Non-Permit

No actual or potential atmospheric hazards

All hazards within the space are eliminated or isolated without entry

**NOTE: Forced air ventilation does NOT constitute elimination or isolation of a hazard**

# Communications and Coordination Requirements

What does the **host employer** need to provide?

Before entry operations begin, the **host employer** must provide the following information, if it has it, to the **controlling contractor**:

- Location of each known permit space
- Hazards or potential hazards in each space or the reason it is a permit space; and
- Any precautions that the host employer or any previous controlling contractor or entry employer implemented for the protection of employees

# Controlling Contractor

*Prior to entry the Controlling Contractor must*

Obtain **host employer's** information about the permit space hazards and previous entry operations

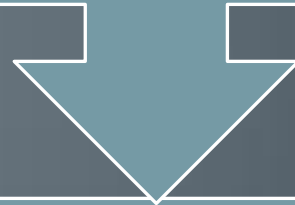
Provide the following information to each entity entering a permit space and any other entity at the worksite whose activities could foreseeably result in a hazard in the permit space

- **Host employer's** information
- Any other pertinent information
- Precautions required by the host, controlling or other **entry employers**

# Entry Employer Responsibilities

*Prior to entry employers must*

Obtain all of the **controlling contractor's** information regarding permit space hazards and entry operations



Inform the **controlling contractor** of the permit space program that the **entry employer** will follow. This must include:

Any hazards likely to be confronted

Any hazards that may be created

# Coordination of Entry

## *Controlling Contractor and Entry Employer*



Entry operations must be coordinated between the **entry employer and the controlling contractor** when:

- More than one entity performs permit space entry at the same time
- Permit space entry is performed at the same time that any activities that could foreseeably result in a hazard in the permit space are performed



Examples of this could include:

- Welding outside the space
- Engine combustion
- Equipment operations

# After Entry

## *Controlling Contractor*

Debrief each entity that entered a permit space regarding

- The permit space program followed
- Any hazards confronted or created
- Apprise the **host employer** of the information exchanged

## After Entry

### *Entry Employer*

Inform the **controlling contractor** in a timely manner of

- The permit space program followed
- Any hazards confronted or created



# Permit-Required Confined Space Program

## *Entry Employers*

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Implement measures necessary to prevent unauthorized entry

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Identify and evaluate the hazards of the permit spaces before employees enter them

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Develop and implement the means, procedures and practices for safe permit space entry.

# What does this involve?

*The employer must do the following*



Specify acceptable entry conditions

Provide entrants or representatives with the opportunity to observe any monitoring or testing of the permit space

Isolate the permit space and physical hazards within the space

Purge, inert, flush, or ventilate the permit space as necessary to eliminate or control atmospheric hazards

# What does this involve?

*The employer must do the following*

Monitoring procedures must detect an increase in any atmospheric hazard level in sufficient time for entrant to exit in the event of a ventilation failure

Provide pedestrian, vehicle or other barricades to protect entrants from external hazards

Verify that conditions in the permit space are acceptable throughout the duration of the entry and ensure employees do not remain in or enter a permit space with a hazardous atmosphere.

What does this involve?

*The employer must do the following*

Eliminate any conditions that make it unsafe to remove the entrance cover

- High heat
- Extreme cold
- Pressure
- Gases with a low specific gravity

## Flammable or Combustible Atmosphere

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If the LEL cannot be decreased to below 10% the employer must:

Inert the space so that the entire atmosphere is non-combustible

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Employees use PPE to address any other atmospheric hazards

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Eliminates or isolates all physical hazards

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# Confined Space Equipment

*Must be provided at not cost to employees*

Equipment must  
be maintained  
and employees  
must be trained  
on the use of  
the equipment.

# Confined Space Equipment

*Must be provided at no cost to employees*

Testing and monitoring equipment

Communications equipment

PPE

Lighting equipment

- May need to be intrinsically safe



# Confined Space Equipment

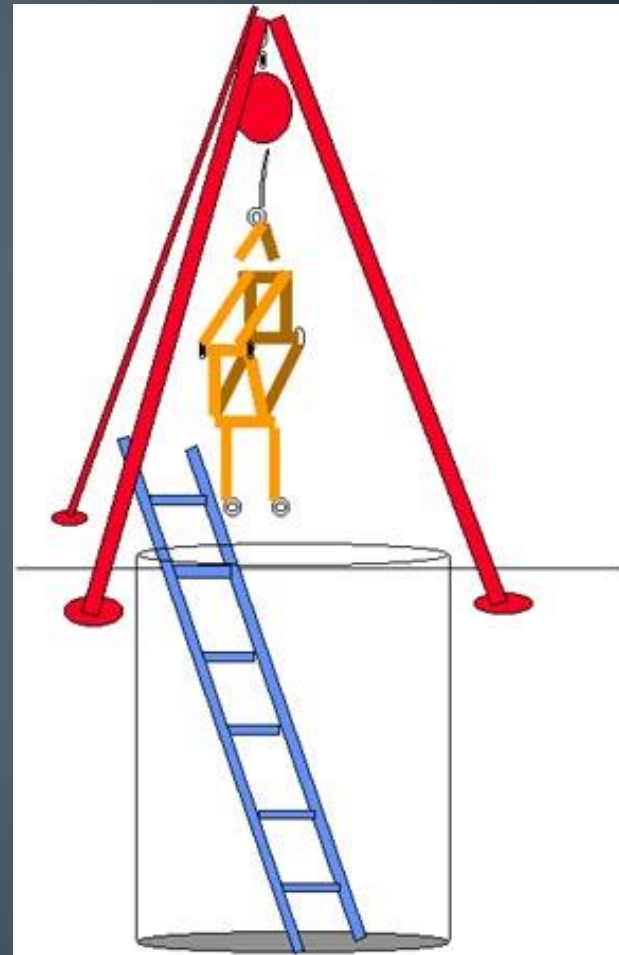
*Must be provided at no cost to employees*

Barriers and shields

Access and egress equipment, such as ladders

Rescue and emergency equipment

Any other equipment





# Permit Space Evaluation

*For all entry operations*

Test conditions  
prior to any  
changes to  
ventilation and  
before any  
entry begins.

## Infeasible Isolation of Space

If a space is part of a network, such as storm drains and sewers or is too large to isolate, the employer must:

- Perform pre-entry testing to the extent feasible before entry
- Continuously monitor entry conditions in the work area(s)
- Provide early warning systems that continuously monitor for non-isolated engulfment hazards. System must alert authorized entrants and attendants in sufficient time for them to safely exit

## A Word on Air Monitoring

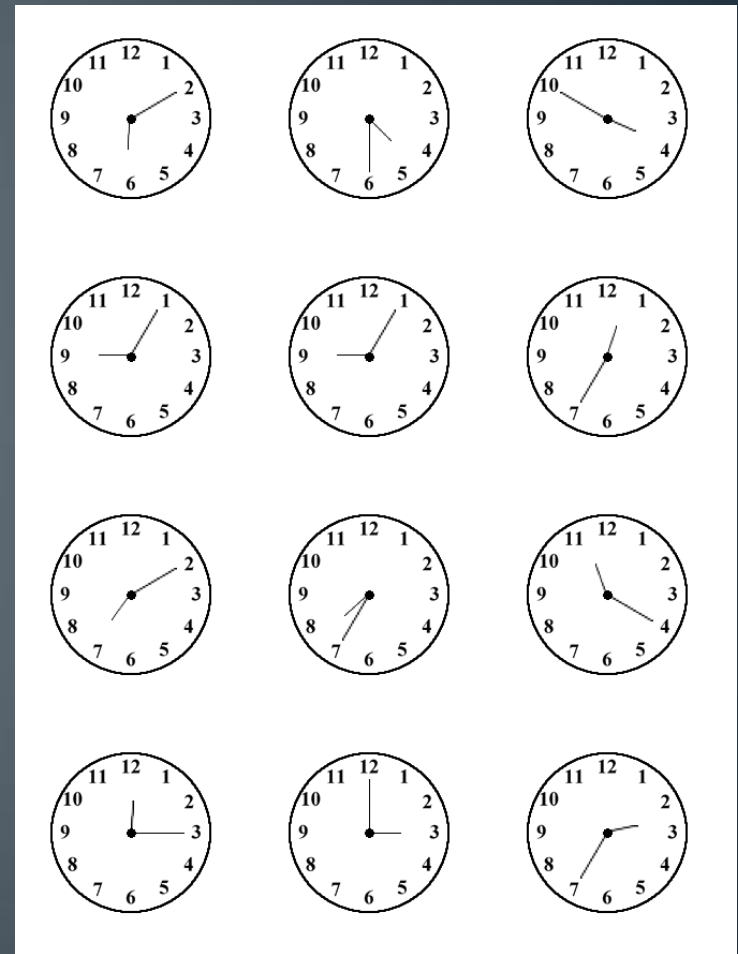
Continuous air monitoring is required in all permit spaces and even in non-permit spaces. There are two exceptions to this:

- Continuous monitoring is not commercially available or periodic monitoring sufficient frequency to ensure that the atmospheric hazards is being controlled at safe levels



# A Word on Air Monitoring

It will probably be difficult to prove a commercial air monitor is not available, or that you are checking frequently enough to be as safe as continuous monitoring.



# Air Testing Chronology

Oxygen

Combustible gases and vapors

Toxic gases and vapors

# Observation and Retesting

All entrants must be allowed to observe testing

If an entrant or authorized representative requests a reevaluation

Results must be provided as requested and required

# Attendants

**At least one attendant  
outside the permit space**

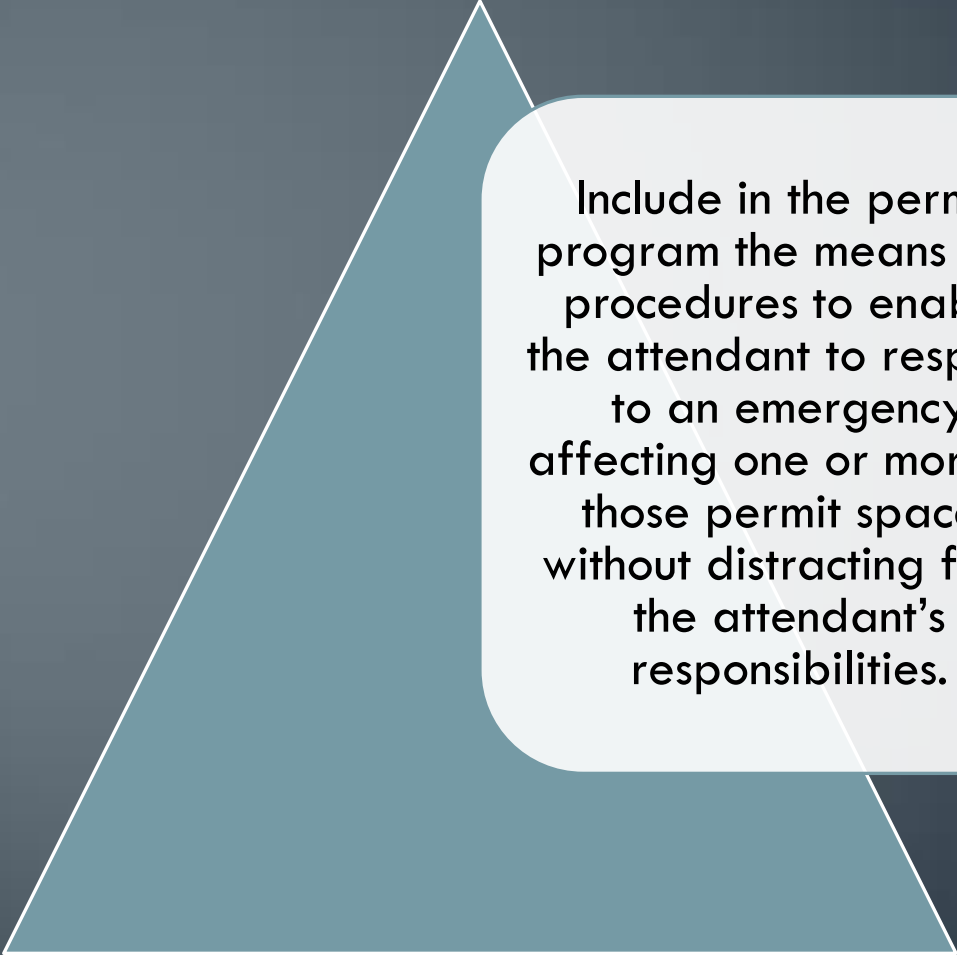
May be assigned to more than one space so long as duties can still be performed

May be at any location as long as they can perform their duties



# Attendants

*If multiple spaces are assigned you must*



Include in the permit program the means and procedures to enable the attendant to respond to an emergency affecting one or more of those permit spaces without distracting from the attendant's responsibilities.



## Designated Roles

List each person's role and responsibilities in entry operations.

- Name
- Role
- Duties

Ensure they are trained in their responsibilities

# Emergency Services

*The entry employer must*

**Develop and implement procedures for summoning rescue and emergency services**

- **This includes procedures for summoning emergency assistance in the event of a failed non-entry rescue!**

# Emergency Services

*The entry employer must*

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Describe how to rescue entrants for permit spaces

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Describe how emergency services are provided to rescued employees

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Describe how to prevent unauthorized personnel from attempting a rescue

# Entry permits

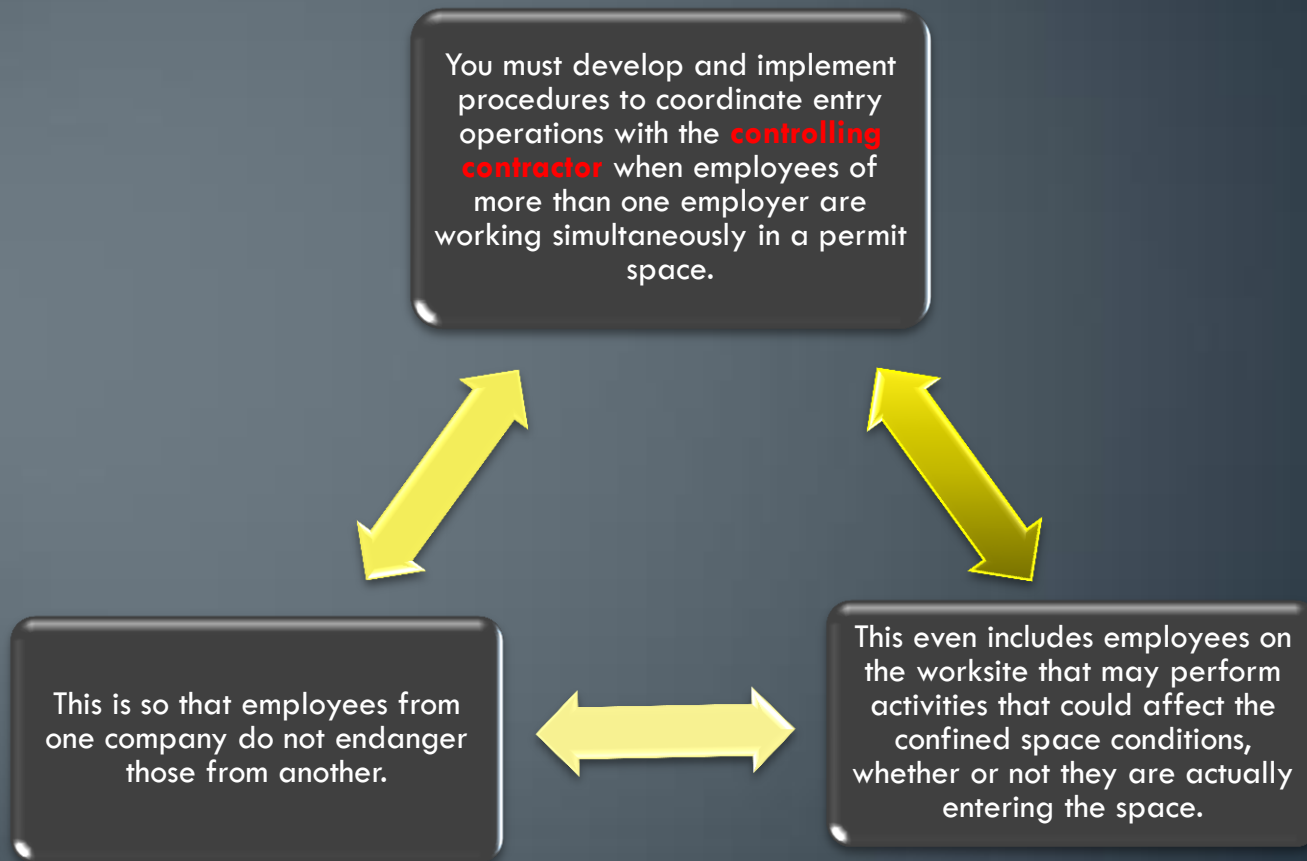
*The entry employer must develop and implement*

System for preparation, issuance, use and cancellation of entry permits

- This includes the safe termination of planned and emergency conditions

# Multiemployer Situation

*This means you need to take some added steps!*



# Conclusion of Entry

*The employer must*

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Develop and implement procedures for concluding the entry once entry operations are completed

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Entry operations must be reviewed when measures taken may not protect employees and the program must be revised to correct the deficiencies.

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This must be done and documented prior to any other entries.

# Examples of situations that might require a review

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Unauthorized entry

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Detection of a permit space hazard not covered by the permit

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Detection of a condition prohibited by the permit

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Occurrence of an injury or near-miss during entry

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Change in use of space

---

Change in space configuration

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Employee complaints

# Permit Space Program Review

*Using the cancelled permits*

Review program within one year after each entry

- Revise program as necessary

**Permits must be retained for one year!**



# Review

*Good news here....*

You may perform  
one annual  
review covering  
all entries during  
a twelve month  
period.

# Permitting Process

*Before entry begins*

## Before entry

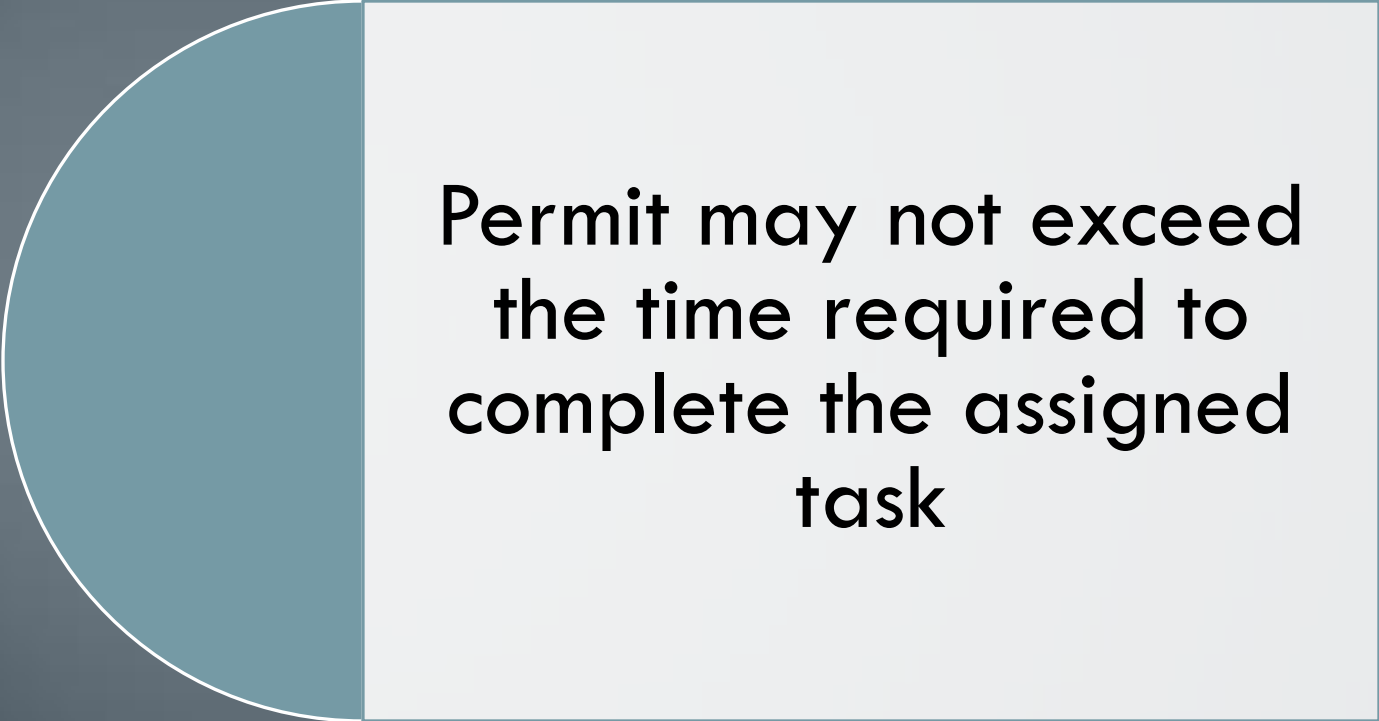
- Permit must be signed by Supervisor

## Completed permit

- Available at time of entry
- Posted at the entry portal or equally effective area
- Entrants confirm pre-entry preparations are completed

# Permitting Process

## *Permit duration*



**Permit may not exceed  
the time required to  
complete the assigned  
task**

# Termination Conditions

*Supervisor must terminate entry if:*

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Operations are completed

---

Suspend or cancel if a condition that is not allowed arises in or near the permit space, is temporary and does not change the configuration of the space or create a new hazard within it

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Cancel the entry permit when a condition that is not allowed arises in or near the permit space and the condition is not covered

# The Entry Permit

*Here is what your permit must identify*

Space to be entered

Entry purpose

Entry date and duration

Authorized entrants

- By name or other identifier
- Permit must also be able to note who is inside and outside at any given time

Atmospheric hazard monitoring methods in the event the ventilation stops

# The Entry Permit

*Here is what your permit must identify*

Name of each attendant

Entry supervisor name and signature

Permit space hazards

Methods used to isolate the space

Permit space hazards controls or elimination

# The Entry Permit

*Here is what your permit must identify*

Acceptable entry conditions

Test results

Names or initial of the testers

Test times

# The Entry Permit

*Here is what your permit must identify*

Rescue and emergency services

Means of summoning services

Equipment and numbers to call services



# The Entry Permit

*Here is what your permit must identify*

Communication procedures for entrants and attendants

PPE

Testing equipment

Communication equipment

# The Entry Permit

*Here is what your permit must identify*

Alarm systems

Rescue equipment

Specific information as it applies to the entry

Any additional permit required

- Hot work

# Required Training

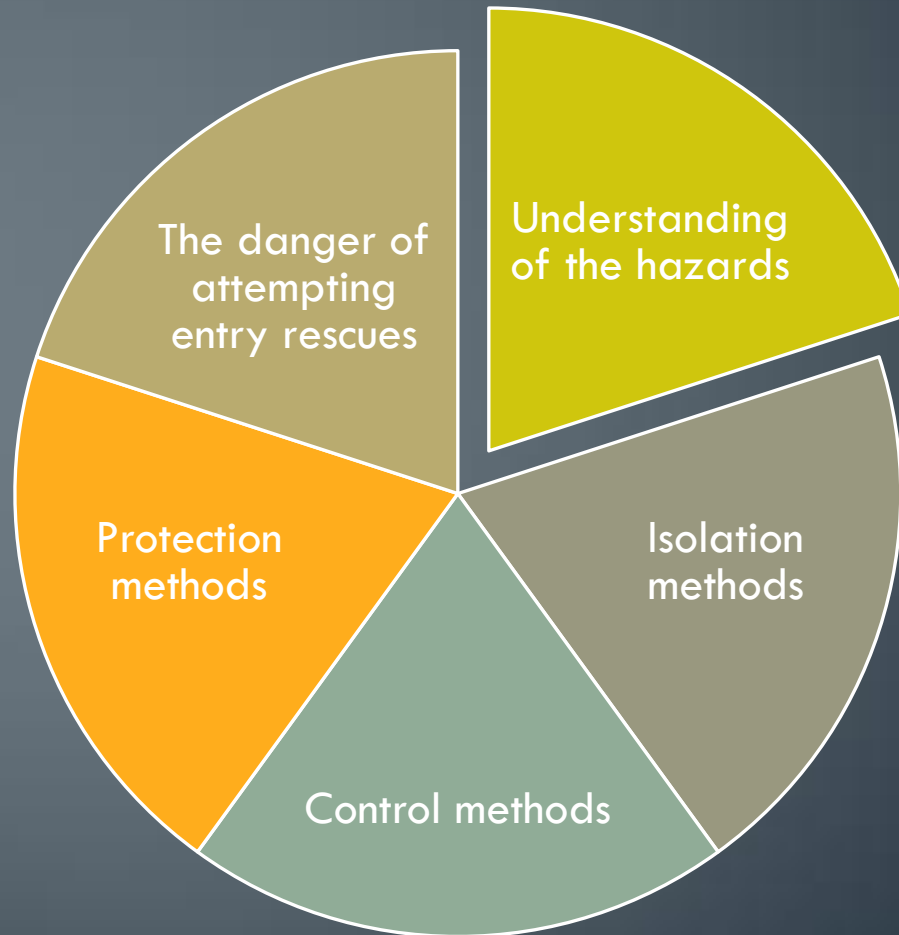
*It better be good!*

Training must be at  
not cost to employee  
and must ensure that  
employees  
understand, are  
knowledgeable and  
have the skills to  
perform their duties!



# Training

*Training must result in the following*



# Training

*Provided to each affected employee*

Language and vocabulary they understand

Before employee is assigned duties

Before any changes in duties

Whenever there are changes in the permit space entry operations

Whenever there is evidence of a deviation from:

- Procedures
- Standards

Employees demonstrates inadequate knowledge

# Training

Must establish proficiency in:

- Required duties
- Regulatory standard
- New procedures
- Revised procedures
- Program compliance



# Training Records

*Must show the following*

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Employees Name

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Name of trainers

---

Training date(s)

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Must be maintained  
throughout employees  
employment



# Authorized Entrant Responsibilities

*Entry employer must ensure*

Understand all hazards they face including:

- Mode
- Signs
- Symptoms
- Consequences of exposure



# Authorized Entrant Responsibilities

*Entry employer must ensure*

---

All equipment is used properly

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Communications are maintained with attendant



# Authorized Entrant Responsibilities

*Entrant must alert attendant whenever*



Warning sign  
of exposure to  
a dangerous  
situation

Symptom of  
exposure

A prohibited  
condition is  
detected

# Authorized Entrant Responsibilities

*Entrant must exit the permit space quickly whenever*

Supervisor or attendant order evacuation

Warnings sign or symptom of dangerous situation

A prohibited condition is detected

Evacuation alarm is activated



# Attendant Responsibilities

*Attendant must*

Understand all hazards they face including:

- Mode
- Signs
- Symptoms
- Consequences of exposure

# Attendant Responsibilities

*Additional responsibilities include*

Aware of behavioral effects of hazards

Continuously maintain an accurate count of entrants

Remain outside space until relieved by another attendant

Communicate with entrants as necessary to assess their condition

# Attendant Responsibilities

Assesses activities and conditions inside and outside the space.

Orders evacuation if:

- Prohibited condition is identified
- Behavioral effects of exposure are apparent
- Situation outside the space poses a danger
- Attendant cannot perform duties

# Attendant Responsibilities

Summon rescue  
and other  
emergency  
services if entrant  
needs assistance  
to escape

# Attendant Responsibilities

*If unauthorized persons approach*

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Warns them away  
from area

---

Warns them to exit  
immediately if they  
enter the space

---

Informs entrants and  
supervisors of the  
intruder



# Attendant Responsibilities

Performs non-entry rescue

Performs no duties that might interfere with primary duty at attendant



## Entry Supervisors

Understand all hazards they face including:

- Mode
- Signs
- Symptoms
- Consequences of exposure

# Entry Supervisors

*Must verify the following by checking the permit*

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All required information is provided

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All required tests have been conducted and documented

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All equipment specified is provided

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All procedures are being followed

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Only endorses once satisfied everything is being done properly

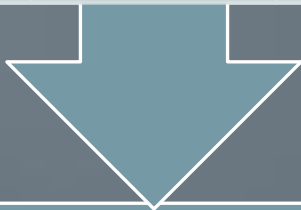
# Entry Supervisors

If any hazardous or unacceptable conditions arise

Terminates  
the entry

Cancels  
the permit

Suspends  
permit



This includes inside and  
outside the permit space



# Entry Supervisors

*Verifies*

Rescue services are available

Means for summoning is operable

Employer is notified if services become unavailable



# Entry Supervisors

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Removes unauthorized individuals

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Ensure that operations remain consistent with terms of entry permit and that acceptable entry conditions are maintained when responsibility is transferred

# Rescue & Emergency Services

*If you designate rescue services you must do the following*

Evaluate the rescuer's ability to respond to a summons in a timely manner with consideration to the hazard(s).



NOTE: What is considered timely varies according to hazard

**IDLH = Standby**



# Rescue & Emergency Services

## Evaluation must include

- Proficiency with rescue related tasks and equipment
- Functional ability while performing a rescue
- Functional ability for particular permit spaces identified



# Rescue & Emergency Services

## *Selected rescue team*

### The selected team must

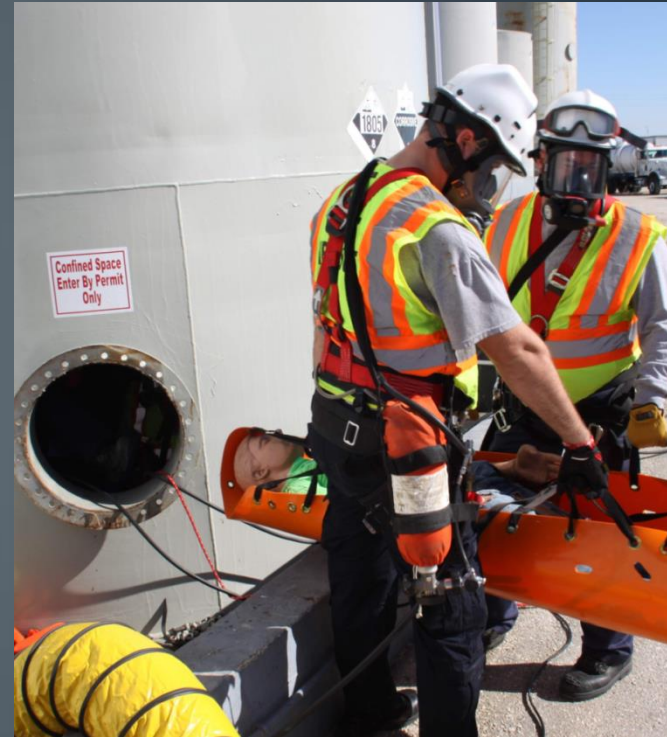
- Have capability to reach victims within a time frame that is appropriate for the permit space and hazards
- Be equipped for, and proficient in, performing the needed rescue services
- Agrees to notify the employer immediately in the event that rescue service becomes unavailable



# Rescue & Emergency Services

Each rescue team must be informed of the hazards they may confront

Rescue teams must have access to all permit spaces from which a rescue may be necessary to that an appropriate rescue plan may be developed and so they may practice rescue operations



# Employer Provided Rescue & Emergency Services



All equipment and training must be at no cost to employees

Provide all PPE required and ensure employee is proficient in its use

Train employees in all rescue duties and entrant duties

Train employees in basic first aid and CPR

- At least one team member must be current

# Employer Provided Rescue & Emergency Services

*Practice Makes Perfect*

Must practice making permit space rescues

Must conduct a practice drill once every 12 months

- Exception: A successful rescue was made in the previous 12 months

# Employer Provided Rescue & Emergency Services

## *Simulated Rescue Operations*

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The team must remove dummies, manikins or actual people from a confined space

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Practice must be from the actual permit spaces or a designated representative space

# Employer Provided Rescue & Emergency Services

## *Representative Spaces*

Representative spaces must simulate:

- Opening size
- Configuration
- Accessibility
- The types of permit spaces where rescue would be performed

# Non-Entry Rescue

*This is the best and preferred method*

Required unless it would be ineffective or more dangerous

Rescue service must be designated if this method is not used

- Even if it is not used, employer must confirm that rescue service is available in the event of a non-entry rescue failure

Must be used whenever an authorized entrant enters the space

# Non-Entry Rescue

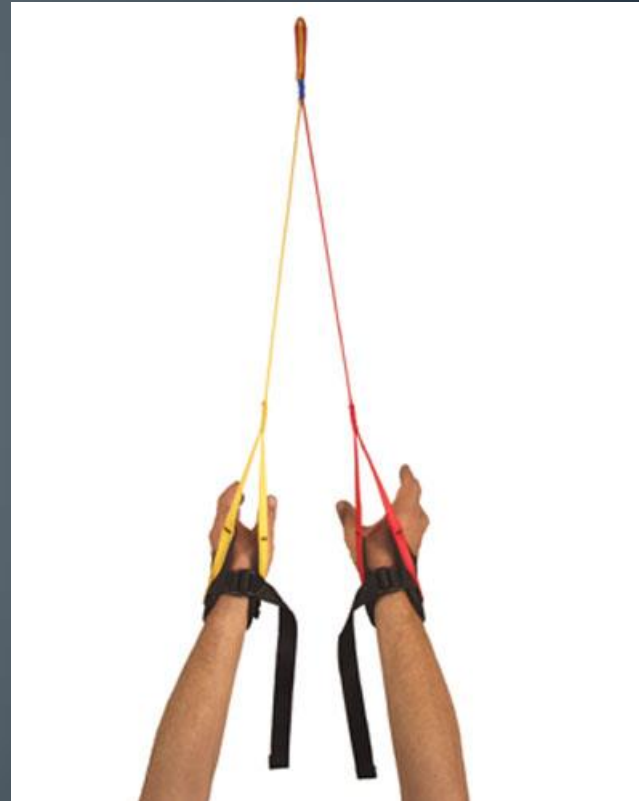
## *Retrieval Systems*

### Harness:

- Chest or full body
- Attached at center of back near shoulders
- Above the person's head
- Or equally effective point

### Alternative devices:

- Wristlets and anklets may be used if chest or full body harness is infeasible





# Non-Entry Rescue

## Retrieval Systems

### Retrieval line

- Attached to mechanical device or fixed point
- Mechanical device required if over 5 feet deep



# Non-Entry Rescue

## *Retrieval Systems*

May not use unsuitable systems

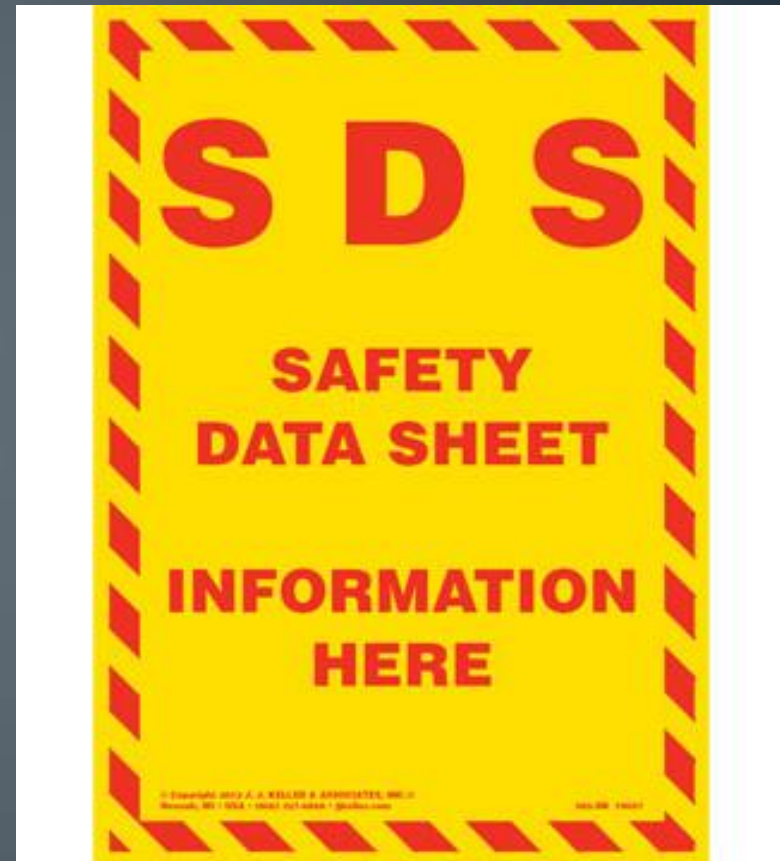
- Likely to become entangled in the space
- Likely to become entangled with other entrants systems
- Internal configuration of space will not allow them to work effectively
- May pose a greater hazard



# Safety Data Sheets

Must be  
available to  
medical staff

Should cover  
any  
exposures



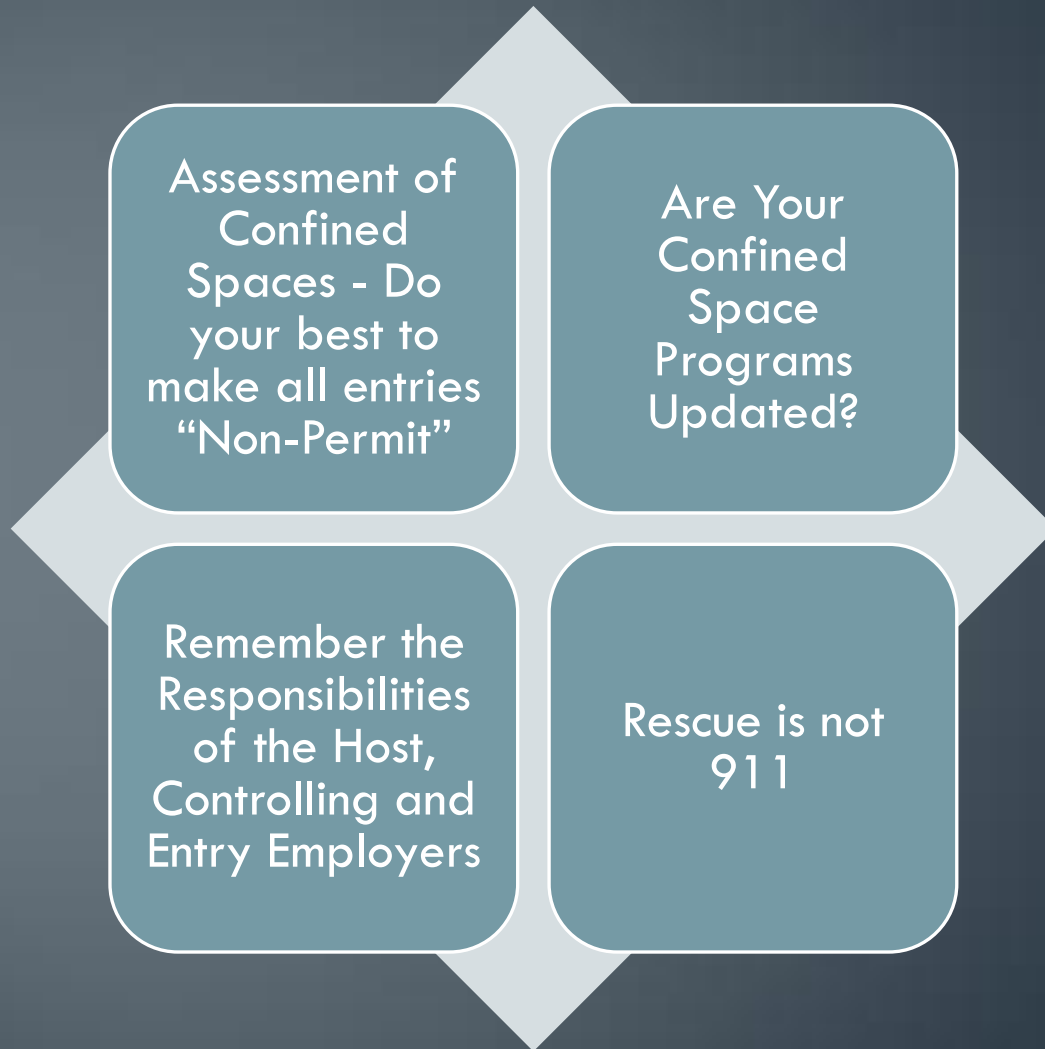
# Employee Participation



Employers must consult with affected employees and authorized representatives on the development and implementation of all aspects of the permit space program

All information in the program must be available for review

# Conclusion



*Thank you for your time!*

**Questions?**