

# CONSTRUCTION HEALTH AND SAFETY TECHNOLOGIST

## Examination Preparatory Training Program

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# SECTION VII

- ▣ Confined Space
- ▣ Demolition
- ▣ Scaffolds
- ▣ Education and Training
- ▣ Ethics

# CONFINED SPACE ENTRY

29 CFR 1910.146

# Confined Space

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A space that:

- ▣ Is large enough and so configured that an employee can enter bodily and perform work;
- ▣ Has limited or restricted means of entry or exit;
- ▣ Is not designed for continuous human occupancy.

# Examples of Confined Spaces:

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- ▣ Tanks
- ▣ Manholes
- ▣ Boilers
- ▣ Furnaces
- ▣ Sewers
- ▣ Silos
- ▣ Hoppers
- ▣ Vaults
- ▣ Pipes
- ▣ Trenches
- ▣ Tunnels
- ▣ Ducts
- ▣ Bins
- ▣ Pits

# Potential Hazards

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- ▣ Oxygen Deficiency
  - <19.5% or >23.5% oxygen concentration
- ▣ Combustibles
  - Methane
  - Hydrogen
  - Acetylene
  - Propane
  - Gasoline fumes
- ▣ Toxic Materials
  - Carbon Monoxide
  - Hydrogen Sulfide
  - Welding fumes
  - Corrosives
- ▣ Electricity
- ▣ Mechanical Hazards
  - Mixers
  - Crushers

# ENTRY

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- ▣ The act by which a person intentionally passes through an opening into a permit required confined space.
- ▣ Any part of the body passing through the opening is considered entry.



# IMMEDIATELY DANGEROUS TO LIFE OR HEALTH

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- ▣ Any condition which poses an immediate threat to the health of life on an entrant, or;
- ▣ Would cause irreversible adverse health effects, or;
- ▣ Would interfere with an individual's ability to escape unaided from a permit space.

# ENTRANT

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- ▣ The employee who will physically enter the confined space to perform the work and is authorized by the employer to enter the space.



# ATTENDANT

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The employee who remains outside the confined space and monitors the entrant(s); guards the space against unauthorized entry; warns the entrants of any unusual conditions; and summons the rescue personnel if needed.

# Permit-Required Confined Space

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A Permit-Required Confined Space is confined space that has one or more of the following characteristics:

- ▣ Contains or has the 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 become trapped or asphyxiated;  
or
- ▣ Contains any other serious safety or health hazard.

# Entry Supervisor

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- ▣ Person responsible for determining if acceptable entry conditions are present, oversees entry operation and terminates entry as appropriate.



# Non-Permit Confined Space

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- ▣ A confined space that does not contain or, with respect to atmospheric hazards, have the potential to contain any hazard capable of causing death or serious physical harm.



# General Requirements

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- ▣ Evaluate workplace to determine if any spaces are permit requires spaces
  - Post signs
  - Take 'effective' means to prevent entry by unauthorized
- ▣ Written program available for inspection



# General Requirements

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- ▣ Test atmosphere before entry with calibrated instrument
  - Oxygen first
  - Flammable gasses / vapors
  - Potential toxic contaminants
  - Entrants may observe testing
- ▣ Bad air removed before entry
  - Forced air ventilation used while occupied
  - Forced air from clean source
- ▣ Atmosphere periodically tested

# General Requirements

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- ▣ If hazard detected during entry:
  - All workers leave space immediately
  - Measures taken to make safe before entry
- ▣ If non-permit conditions change during the job, the space shall be immediately evacuated, and reclassified as a permit-required confined space; or conditions shall be returned to non-permit conditions and again certified as such by the entry supervisor.

# Sub-Contractor Use of Confined Space

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- ▣ Host employer:
  - Inform of permit spaces
  - Describe circumstances and precautions
  - Coordinate entry operations with sub-contractor
  - De-brief at conclusion of entry

# Permit Required Program

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- ▣ Implement measures to prevent unauthorized entry
- ▣ Identify hazards of space before entry
- ▣ Develop and implement procedures for safe entry:
  - Specify acceptable entry conditions
  - Purge, inert, flush, ventilate space

# Permit Required Program

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- Provide barriers to protect from external hazards
- Continuously monitor conditions
- Maintain communications
- PPE
- Sufficient lighting
- Access equipment (ladder)
- Rescue equipment available
  - Means to summon rescue



# Isolate the Space

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- ❑ Close Valves
- ❑ Double block & bleed, or
- ❑ Blank flange
- ❑ Empty the Space
- ❑ Depressurize, vent & drain
- ❑ Lockout/Tagout Equipment
- ❑ Electrical sources
- ❑ Rotating/reciprocating parts
- ❑ Hazardous materials
- ❑ Clean residue from the space



# Complete Entry Permit Form

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- ▣ Permit must be correctly and completely filled out prior to entry.
- ▣ Permit must be activated by Entry Supervisor's signature to be valid.
- ▣ No entry is allowed without a valid permit.
- ▣ Cancelled permits must be kept on file for at least one year.



# Training

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- ▣ Entire crew must attend
  - Attendants, entrants, entry supervisor
- ▣ Review hazards of entry and work
- ▣ Review PPE
- ▣ Review procedure for contacting rescue
  - verify rescue available
- ▣ Complete permit

# Attendant Responsibilities

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- ▣ To monitor entrants during the job and during entry & exit to help insure their safety.
  - The attendant may not abandon his post for any reason while personnel are in the space unless relieved by another qualified attendant.
- ▣ To monitor atmospheric conditions in the space prior to and during entry.
- ▣ To control access to the confined space.
- ▣ To summon emergency assistance as needed.
- ▣ To assess hazards in and around the space, and take action on the same.
- ▣ To keep records of confined space work, such as air test results, personnel entry/exit, etc.

# Entrant Responsibilities

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- ▣ To assure that the space has been adequately ventilated, isolated, emptied, or otherwise made safe for entry.
- ▣ To immediately exit a space, without question, upon word of the attendant, no matter what the reason.
- ▣ To follow all safety rules and procedures that apply to the job.
- ▣ To be familiar with the work to be performed and the procedures that apply to the job.
- ▣ To use the appropriate PPE whenever necessary.

# Supervisor Responsibilities

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- ▣ To assure adequate protection is provided to the entrants by verifying adequate lockout/tagout and that all hazards are securely isolated.
- ▣ To support the attendant's authority in controlling access to a confined space.
- ▣ To verify that all personnel have exited prior to closing the space.
- ▣ To assure that all personnel involved are aware of the hazards associated with the space.
- ▣ To assure that rescue services are available prior to entry.