A Brief Review of Confined Space and Lockout/Tagout Topics

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Confined Spaces

• Limited Openings for Entry and Exit **AND**

• Large enough and so configured to allow employee to enter and perform work **AND**

• Not Designed for Continuous Occupancy
Typical Confined Spaces

- Boiler, Degreaser, Furnace
- Pipeline, Pit, Pumping Station
- Reaction or Process Vessel, Mills
- Septic Tank, Sewage Digestor
- Silo, Storage Tank, Barges
- Sewer, Utility Vault, Manhole
- Trenches, Shafts, Caissons
Standby / Rescue

• Worker assigned to remain outside the confined space and be in constant contact with the workers inside.
• Know emergency rescue procedures.
• 50% of workers who die in confined spaces are would-be rescuers.
• Trained in use of emergency rescue equipment and PPE.
Permit-Required Confined Space ( Permit Space)

- A confined space is a permit space if it has one or more of the four specific characteristics that make the space potentially hazardous.
- Any one of these characteristics makes a confined space a permit space.

### Permit Space Characteristics

- Hazardous atmosphere
- Engulfing materials
- Inwardly converging walls, or
- Other serious hazards
Any Other Recognized Serious Safety or Health Hazards

- Electrical equipment
- Mechanical equipment
- Visibility - lighting
- Biohazards
- Claustrophobia
- Noise
- Radiation
- Temperature: HEAT
- Slips and falls
Other Serious Hazards: Isolation

Complex Set of Exposures

• Locking and tagging out electrical sources, shutoff valves.
• Blanking and bleeding pneumatic and hydraulic lines.
• Disconnecting mechanical drives and shafts.
• Securing mechanical parts.
• Blanking sewer and water flow.
Multi-Employer Provision General Industry

• When an employer (host employer) arranges to have a contractor perform permit space work, both employers must follow the requirements of the standard

• Paragraph (c)(8) lists five duties that the host employer has toward the contractor

<table>
<thead>
<tr>
<th>Host Employer to Contractor</th>
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<tbody>
<tr>
<td>• Inform of permit spaces</td>
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<tr>
<td>• Apprise of hazards</td>
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<td>• Apprise of precautions and procedures</td>
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<td>• Coordinate entry operations</td>
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<td>• Debrief</td>
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Contractor Responsibilities
General Industry

• Contractors are employers hired to perform work in confined spaces
• Examples include companies that perform:
  – Tank cleaning,
  – Railroad car cleaning, and
  – Maintenance
• Paragraph (c)(9) lists three duties that the contractor must perform in addition to complying with the permit space requirements that apply to all employees

**Contractor**

- Obtain information,
- Coordinate entry, and
- Inform/debrief the host employer
Information Exchange
Reaching-In Hazards
THIS SPACE IS CONFINED

• If the plane of the opening into a permit space is broken by any part of the worker’s body and there is exposure to a hazard (as shown in this graphic), the entry is considered a serious violation.
Permit Program Requirements

- Prevent unauthorized entry, (d)(1)
- Identify and evaluate hazards before entry, (d)(2)
- Implement safe entry procedures, (d)(3)
- Provide and maintain equipment, (d)(4)
- Evaluate permit space conditions, (d)(5)
- Provide attendant(s), (d)(6)
- Provide plan if attendant is to monitor more than one permit space or an emergency occurs, (d)(7)
Permit Program Requirements (cont’d)

- Designate persons with active roles, (d)(8)
- Develop and implement rescue and emergency procedures, (d)(9)
- Develop and implement an entry permit system, (d)(10)
- Develop and implement procedures to coordinate entry operations when employees of more than one employer will enter a space, (d)(11)
- Develop and implement procedures for concluding an entry, (d)(12)
- Review entry operations, (d)(13)
- Review the permit space program, (d)(14) (*within 1 year of each entry*)
Entry Permits

- Specific items required on a permit are provided in paragraph (f)
- All fields in the permit must contain correct and complete entries which demonstrate compliance with the standard

Kept for one year. Evaluated as part of the program.
Dangerous Combinations

• Presence of all three confined space characteristics can complicate the situation.
• Working in and around the space.
• Rescue operations during emergencies.
• Worsened conditions due to work activities:
  – Welding and cutting, use of bonding agents
  – Cleaning with solvents, use of other chemicals
  – Use of gas-powered equipment
Testing The Atmosphere

• Verify presence of safe work atmosphere.
• Oxygen levels must be tested, **FIRST**.
• Test all areas of a confined space.
  – Top, Middle, Bottom
• Methane is lighter than air.
• Carbon Monoxide is the same as air.
• Hydrogen Sulfide is heavier than air.
• Oxygen Deficiency.
ORDER OF TESTING

• First---Oxygen Presence And Amounts
• Second---Flammables
• Third---Toxics
• Others
Always test the air at various levels to be sure that the entire space is safe.

Good air near the opening does NOT mean there is good air at the bottom!
Ventilation

• First option to correct problems.
• Make sure that ventilation is set up so entire confined space is ventilated.
• Must be aware of hazards you are trying to correct in the confined space.
• Air intake in a safe location to draw fresh air only.
• Continuous ventilation whenever possible.
• Retest the confined space before entry.
Rescue & Emergency Procedures

There are three types of rescue:

- Self-rescue
- Non-Entry rescue
- Entry rescue
Force Required to Extract a Victim from Grain

165 pound person
Rescue Team Employer’s Responsibilities

- Provide rescue teams with PPE and training to conduct rescues safely [(k)(2)(i)]
- Train rescue teams to perform assigned rescue duties and establish rescue teams’ proficiency as authorized entrants [(k)(2)(ii)]
- Train rescue teams in basic first-aid and CPR [(k)(2)(iii)]
- Ensure that rescue teams practice at least once every 12 months [(k)(2)(iv)]
Three options to permit-required confined space rescue

1. Arrange for rescue service from an outside source.

2. Arrange for your own employees to provide rescue

3. Provide for non-entry rescue

Read Appendix F - For Clarification
Non-Entry Rescue

- Rescue must be onsite
- Only if it can be done safely
- Mechanical retrieval over 5 feet
- Not use wristlets unless justified
Entry Rescue

• Qualified
• Must respond in a timely manner
• Training and exercise requirements
Training and Education

• All workers who must enter confined spaces
• All attendants and rescue team members.
• Prior to initial work assignment.
• Retraining:
  • Job duties change.
  • Change in permit-space program.
  • New hazards are present.
  • Job performance indicates deficiencies.
29 CFR 1910.147 (and 1910.333(b)(2))
Control of Hazardous Energy
(Lockout/Tagout)
Important OSHA Directive Document:

• CPL 02-00-147 - 29 CFR 1910.147, the Control of Hazardous (Lockout/Tagout) - Inspection Procedures and Interpretive Guidance
Energy Control Program:

- The employer shall establish a program consisting of
  - an energy control procedure,
  - employee training, and
  - periodic inspections

To ensure that, before any employee performs servicing or maintenance on a machine or equipment where the unexpected energizing, start up or release of stored energy could cause injury, the machine or equipment shall be isolated from the energy source, and rendered inoperative.

1910.147(c)(1)
Energy Control Procedure

• Procedures shall be developed, documented and utilized for the control of potentially hazardous energy when employees are engaged in servicing and maintenance.
Procedures:

• Must include:
  – Scope
  – Purpose
  – Authorization
  – Rules
  – Techniques to be utilized
  – Means to enforce compliance

1910.147(c)(4)(ii)
Periodic Inspection:

- At least annually
- Performed by authorized employee [other than the one(s) using procedure being inspected]
- Designed to correct deficiencies
- **LOCKOUT**: Must review each authorized employee’s responsibilities
- **TAGOUT**: Must review each authorized and affected employee’s responsibilities and additional training requirements of 1910.147(c)(7)(ii)
- Employer certification required
Outside Personnel (Contractors)

• On-site employer and outside employer shall inform each other of their respective procedures

• On-site employer shall ensure that his/her employees understand and comply with contractor’s procedures
Most Cited Standards for NAICS 3328 Coating, Engraving, Heat Treating FY18

TOTAL: 510 Citations, 123 Inspections, Penalties $954,327

• 1910.134 Respirators
• 1910.1200 Haz Com
• 1910.132 General PPE
• 1910.178 Powered Industrial Trucks
• 1910.107 Spray Finishing
• 1910.95 Noise
• 1910.1026 Chromium
## Penalties

<table>
<thead>
<tr>
<th>Type of Violation</th>
<th>New Maximum</th>
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<tr>
<td>Serious and Other-Than-Serious Posting</td>
<td>$13,260 per violation ($12,934 in 2018)</td>
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<tr>
<td>Willful or Repeated</td>
<td>$132,598 per violation ($129,340 in 2018)</td>
</tr>
<tr>
<td>Failure to Abate</td>
<td>$13,260 per day beyond the abatement date</td>
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</table>

[www.osha.gov/penalties](http://www.osha.gov/penalties)