CONFINED SPACE ENTRY
29 CFR 1910.146
General Industry
29 CFR 1926.1201
Construction Industry

Overview of OSHA Standards

Gery Giannini, CET, CIT
Director of Safety/Sales and Training
Heritage Group Safety
317-875-4672

OBJECTIVES

• Define a Confined Space
• Define a Permit-Required Confined Space
• Be Familiar with OSHA Standards and the elements for Emergency Rescue
• Understand the Preparation and Limitations to Emergency Rescue
Confined Space: Definition
“Must meet all Three Below”

• 1. Is large enough and so configured that an employee can bodily enter and perform assigned work; and
• 2. Has a limited or restricted means for entry or exit (For example: tanks, vessels, silos, pits, vaults, hoppers); and
• 3. Is not designed for continuous employee occupancy.

Permit Required
Confined Space: Definition

A Permit Required Confined Space means a confined space that has one or more of the following characteristics:
Key Definition – 1910.146(b)

• “Entry” means when any part of the entrant’s body breaks the plane of the opening who is entering a Permit Required Confined Space.
ENGULFMENT

Being inadvertently trapped or surrounded by a liquid or a finely divided solid

Contains a Material that has the Potential for Engulfing an Entrant

Liquid Releases
Flowable Solid Releases
Solids Breaking Loose from Surface Walls
Causing: Aspiration, Strangulation, Constriction, or Crushing.

COLLAPSE SLOPING

Inwardly Converging Walls or by a Floor which Slopes Downward and Tapers to a Smaller Cross-Section.

FALSE BRIDGING
BRIDGED MATERIAL

Soft Core Build-Up
Moisture Content
Vibration
Weight
Pressure Insertion
Has an Internal Configuration such that an Entrant Could Become Trapped or Asphyxiated

**RESTRICTED**

- Baffling
- Restricted Movement
- Piping Systems
- Valving Systems
- Tight Turns
- Multiple Turns and/or Drops

**ISOLATION**

Contains any other Recognized Serious Safety or Health Hazards.

- Heat > 120°
- Steam
- High Pressure > 60 psi.
- Highly Hazardous Materials
- Electrical
- Kinetic etc.

**ISOLATE / ELIMINATE POTENTIAL**
One by One, 3 Utility Workers Descended and Died.

1. Utility workers in Key Largo, Fla., noticed that a paved street was not settling properly and One Utility Worker decided to remove a manhole cover and descend into the Sewer to investigate. Moments later, the 15-foot-deep hole went silent.

2. Sensing a man down, a Second Worker then descended to perform rescue and he also stopped responding.

3. A Third Worker then entered the same hole to perform rescue with the same results.

4. A Key Largo firefighter (Fourth) on scene made a desperate attempt to save the men but also became unconscious within seconds and was flown to a near by Hospital in Critical Condition. The hole was just wide enough to fit a body and is why the firefighter did not use his breathing Apparatus. The Sewer was filled with Hydrogen Sulfide and Methane Gas created from years of rotted vegetation.

What Was Not Used that Could Have Prevented These Deaths?
Confined Space Entry Fatalities

ASPHYXIATIONS – POISONINGS - DROWNINGS

Death Causes by Confined Space Emergency's

Rescuers 60%
Attendants, Site Employees, Entry Supervisors, Fire Department, Police, EMTs etc.

Who are most often Victims of Death

WOULD BE RESCUERS
BERKELEY, CA University Research Indicates

SURVEY OF LARGE FIRE DEPARTMENTS:

57% of Companies Depend on Fire Departments for Rescue Services:

- Average Arrival Times for Fire Department on Site = 5 Minutes
- Average Arrival Times for Technical Rescue Units on Site = 7 Minutes

Actual Rescue Times Averaging 48 to 123 Minutes

However, Chemical Rescue Response 70 to 173 Minutes

Trapped Air Hazards
Gases – Vapors - Stale Air
Two Keys to Safe Confined Space Entry Activities
VENTILATION & AIR MONITORING

1. Air Monitoring
   Display After Warm-Up
   Checking For
   Oxygen, LEL, CO, H2S

   User Menu
   Flammables
   Calibration
   Operator
   Instrument
   Safe link

   Calibration

   Fresh Air Set-Up
   Bump Testing
Atmospheric Hazards – Vapor Densities of Gases/ Vapors

LIGHTER OR HEAVIER THAN AIR - Where AIR = 1

- Methane - Lighter than Air .55
- Carbon Monoxide – Heavier than Air .97
- Hydrogen Sulfide – Heavier than Air 1.19

Minimal Confined Space Entry Equipment

*FULL BODY HARNESS & LIFELINE

WRISLETS
Vertical Tripod
Harness & Lifelines
Vertical Mechanic Device
Packaging Device
Rescue Services On-Site or Off-Site
TIMELY - VERIFIED - AVAILABLE

Evaluated for Response Time,
OSHA 1910 or 1926 Trained,
Written Rescue Procedures,
Annual Practiced Rescues,
Rescuers Verified Available,
Rescue Service Unavailable - Notification to Stand Down

VERTICLE ENTRY – More than 5’
“When a Ladder is Used”

Fall Arrest & Retrieval, Type 3 Unit
2 Pieces

2 Pieces

Ladder's height exceeded and locked step plates
Center over opening
Feet must be solid
VERTICLE ENTRY – More than 5’

“When a Ladder is Not Used”

RESPONSIBLE DUTIES

Entry Supervisor:
- Set-up
- Recognition/Controls
- Verifications
- Approves Permit
- Terminates Permit
- Site Control
- Rescue Availability
- Communication

Attendant:
- Know the Hazards & Effects
- Establish Communications/Sign Permit
- Stay Outside of Space/Monitor
- Detect Changing Conditions for Exit
- Maintain Count of Entrants
- Summon Rescue if Needed

Entrant:
- Know the Hazards & Effects
- Detect and Initiate Self Rescue
- Properly Use Equipment
- Exit when Requested
- Communicate with Attendant
- Sign Permit
ENTRY PERMITS

• Identify “Permit Required” Space to be Entered
• Purpose of Entry Documented
• Date & Authorized Duration of Permit
• Authorized Entrants – Sign Permit
• Authorized Attendants – Sign Permit
• Name & Signature of Authorized Entry Supervisor – Approves Permit
• Hazards of the Permit Space to be Entered
• Isolation and Verification of Hazard Control Measures
• Acceptable Entry Conditions Verified
• Results Recorded of Initial & Periodic Atmospheric Monitoring
• Rescue & Emergency Services Identified & Verified Available
• Communications Procedures Established
• Equipment Required Set-Up and Ready for Entry & Rescue Operations
• Other Necessary Information and Other Required Permits

CONCLUSION – Be Prepared for What If??

• Evaluate All Confined Spaces for Proper Classification.
• Write Written Entry Procedures for Each Permit Required Confined Space.
• Train Employees on Hazard Identification and Control of Permit Required Confined Spaces.
• Train Employees on How to Use PPE, Equipment and Tools.
• Train Employees on How to Perform Non-Entry Rescue Duties.
• Train Employees on How to Perform Entry Rescue Duties (Site Rescue).
• Evaluate Programs and Entries for Consistency of Written Procedures.
• Perform Periodic Inspections on PPE, Equipment and Tools as needed for Repair, Cleaning, or Replacement.
WHO IS THE MOST IMPORTANT PERSON IN THIS ROOM???

AND DON’T FORGET IT!!!