OSHA Confined Space, Air Monitoring and Fall Protection Untangled

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Instructor & Company Background

- MTech was Established in 1975 Focused On:
  - EPA/OSHA Training
    - Confined Space & Fall Protection
  - Sewer Cleaning Equipment
  - Sewer Inspection Equipment
  - Street Sweeping Equipment
  - Technical Support & Repairs

- Mr. Cira Has Been Involved in the Safety Business for Over Twenty Years:
  - PPE
  - Fall Protection
  - Confined Space

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Our Mission…

The Mission of MTech is to Educate and Influence People to Prevent Accidental Injury and Death

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Seminar Goals…

- Understand Key Elements of OSHA "Permit-Required" Confined Space Regulations and Fall Protection Standards
- Understand Other Key OSHA Regulations Impacting Work in Confined Spaces
- Highlight Common Mistakes
- Understand OHSA Impact on Government Employees
- A Matter of Life or Death

Everyone Goes Home

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Why a Confined Space Standard?

- Nearly 100 fatalities per year
- Over 10,000 injuries per year
- 4.8 million confined spaces in US
  - Plus sewers & manholes
- 60% of all fatalities are “would be” rescuers
- 29% of all fatalities are supervisors

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Dangerous Work…

- Michigan Dept. of Labor:
  - "Working in a confined space is 50 to 100 times more dangerous than any other industrial operation"

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The "Widow Maker"

- 62% of fatalities were due to atmospheric conditions:
  - Hydrogen Sulfide, Methane, Oxygen, Carbon Monoxide
- None of the spaces were tested prior to entry
- None of the spaces were ventilated
- None of the companies had a rescue plan
- Only 15% had completed training

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More Statistics…

- 95% authorized by the boss
- 85% of the time the boss was there
- 29% of the time the fatality was the boss
- 40% of the time hazardous atmosphere NOT present at time of initial entry
- 80% of the time – space entered before with no problems

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If You Work In…

- Manholes/Sewers
- Septic Tanks
- Silos
- Holding Tanks
- Pump Stations
- Lift Stations
- Digesters
- Utility Vaults
- Tunnels
- Pipelines
- Storm Drains
- Storage Tanks

…Then You Work In a Confined Space

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OSHA Standards to Review Today

- OSHA Provides Minimum Standards
  - SEC. 5. Duty
    - aka – General Duty Clause
  - Fall Protection Issues:
    - 1910 – General Industry Standards
    - 1915 – Maritime
    - 1926 – Construction
  - 1910.146 – Confined Spaces

- Ohio House Bill 308-1992 <u>Requires:</u>
  - "All government employers in the state to at a minimum comply with the guidelines of OSHA"
  - Most States have similar requirements

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OSHA Sec 5 – Duty

- General Duty Clause:
  - (a) Each Employer
    - Shall furnish to each of his employees employment and a place of employment which are free from recognized hazards that are causing or are likely to cause death or serious physical harm to his employees;
    - Shall comply with OSHA promulgated under this Act.
  - (b) Each Employee
    - Shall comply with OSHA and all rules, regulations, and orders issued pursuant to this Act which are applicable to his own actions and conduct.

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General Industry Fall Protection

- 1910.23
  - Any time a worker is at a height of four feet or more, the worker is at risk and needs to be protected.
  - Fall protection must be provided at:
    - Four feet in general industry – 1910.23
      - Retrieval device at five feet
      - Assume 4' for everything – Easier
    - Five feet in maritime –1915.77(c)
    - Six feet in construction – 1926 Subpart M
      - See next slide

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Construction Fall Protection

- 1926 Subpart M
  - Each employee on a walking/working surface (horizontal and vertical surface) with an unprotected side or edge which is Six feet or more above a lower level shall be protected from falling by the use of guardrail systems, safety net systems, or personal fall arrest systems
  - Four feet in general industry 1910.23

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Identify Confined Spaces

- 3 Point Test (ALL THREE):
  1. Has a size and shape large enough to enter
  2. Has limited entrances and exits
  3. Is not designed for people to work in continuously

     1910.146(b)

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“Permit- Required” Confined Space (PRCS)

- 4 Point Test (JUST ONE PLUS THREE POINT TEST):
  1. Contains or has the potential to contain a hazardous atmosphere
  2. Contains a material that has the potential for engulfing an entrant
  3. Has an internal configuration such that an entrant could be trapped or asphyxiated
  4. Contains any other RECOGNIZED serious safety or health hazard

1910.146(b)

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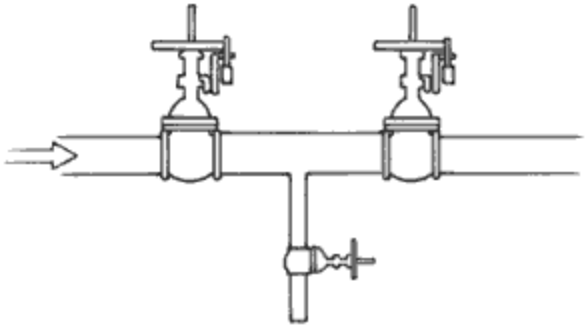
Permit Required Confined Spaces

- PRCS's can be handled in a few ways:
  - Do not enter (Post sign and prevent entry)
  - Enter with permit per 1910.146(c)(4)
  - Remove hazards to make it a non-permit required space per 1910.146(c)(7)
    - Isolation (Line Breakage, Double Block and Bleed, LOTO, etc)



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Evaluate Potential Hazards 1910.146(c)(1)
Three Categories
(the fourth test)

- Atmospheric:
  - Oxygen
  - Toxics
  - Flammable/explosive
- Other Hazards

- Physical:
  - Engulfment
  - Configuration
  - Activation
  - Release of materials
  - Noise
  - Wet/slick surfaces
  - Falling objects
  - Hot/cold temps

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Confined Space – Fall vs. Retrieval

- 1910.146(k)(3):
  - To facilitate non-entry rescue, retrieval systems or methods shall be used…
  - Each authorized entrant shall use a chest or full body harness, with a retrieval line attached at the center of the entrant's back near shoulder level…
  - The other end of the retrieval line shall be attached to a mechanical device or fixed point outside the permit space…
  - A mechanical device shall be available to retrieve personnel from vertical type permit spaces more than 5 feet deep
    - But fall protection at 4'

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1910.146 Appendix B

- Atmospheric Testing:
  - Test for at least the minimum response time of the test instrument
    - With sampling probe, allow time for gas to flow to monitor
  - Stratified atmospheres:
    - A descent into atmospheres that may be stratified, test a distance of approximately four feet in the direction of travel and to each side

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1910.146 Appendix E

- Sewer System Entry:
  - Atmosphere may suddenly and unpredictably become lethally hazardous (toxic, flammable or explosive)
  - Atmospheric monitoring:
    - Oxygen concentration less than 19.5 percent;
    - Flammable gas or vapor at 10 percent or more of the lower flammable limit (LFL);
    - Hydrogen sulfide or carbon monoxide at or above 10 ppm or 35 ppm, respectively
      - Measured as an 8-hour time-weighted average.
    - Testing instrument should be carried and used by the entrant

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Choose the Right Equipment

- Air Monitoring

  1910.146(d)(5)

- Air, Bump, Cal

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Choose the Right Equipment – Cont.

- Ventilation

  1910.146(d)(4)(ii)

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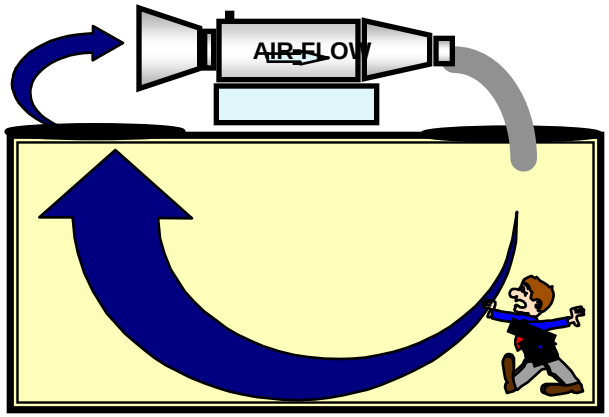
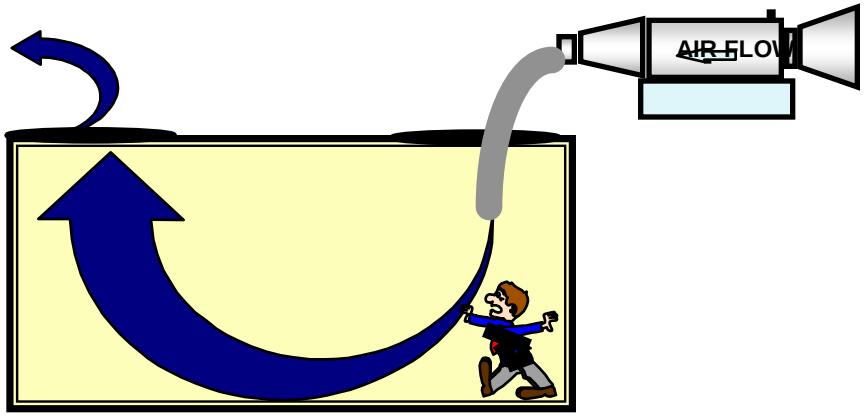
Confined Space Ventilation

GENERAL VENTILATION:

- ☑ **Location of intake & exhaust to <u>prevent recirculation</u>**
- ☑ **Locate <u>air intake</u> in a safe location**
- ☑ **Blow in fresh air suck out bad air–<u>Caution in open system</u>**



SHORT CIRCUIT



BETTER PLACEMENT

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Other Equipment

- XP lighting
  1910.146(d)(4)(v)
- GFCI
- Non-sparking tools
- Barriers
  1910.146(d)(4)(vi)
- Entry
  1910.146(d)(4)(vii)

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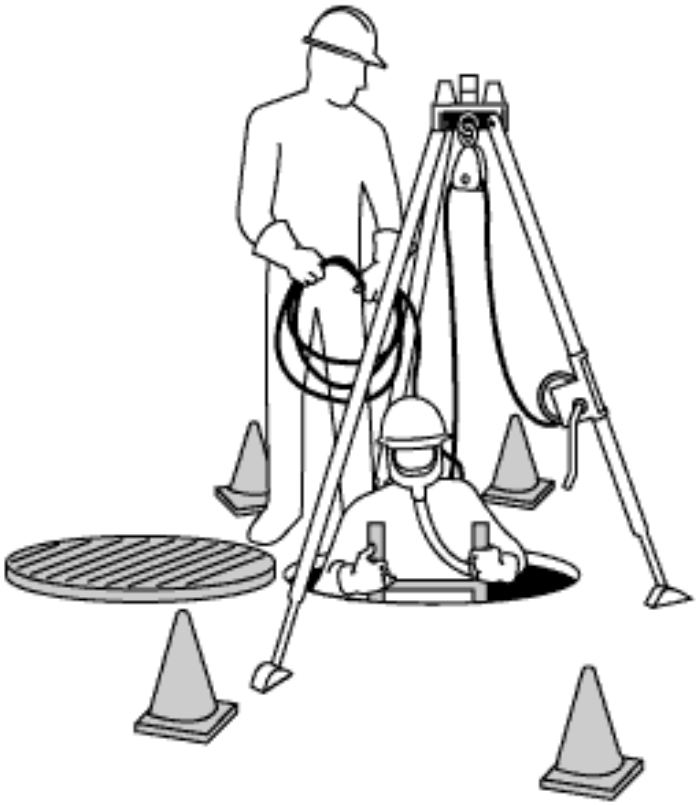
The Entry Team

- Entry Supervisor
- Authorized Entrant
  - One toe in hole
- Attendant
  - Can be supervisor as well
- Minimum of two people on a team



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Four Rescue Procedures…
Widely Misunderstood

- Self-rescue
- Non-entry retrieval
- Entry rescue by company employees
- Entry rescue by emergency responders from outside company 1910.146(k)
  - Details to follow

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Self-Rescue

- Climb out

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Non-Entry Retrieval

- Two means of egress
  - What are yours?
    - Ladder?
    - Use winch first to preserve fall protection
- 99% of you must stop here for rescue 1910.146(k)(3)

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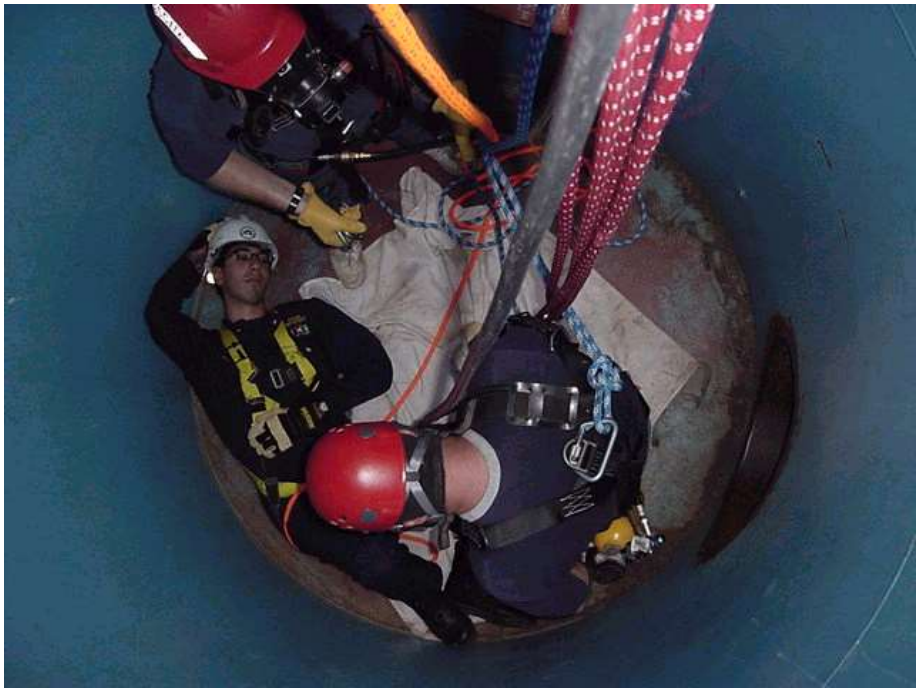
Entry Rescue – Company Employee

- Specialized training
- Annual requirements
- Dry runs requirements 1910.146(k)(2) & Appendix F



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Entry Rescue – Third Party

- Entry rescue by emergency responders from outside company
- Must inform prior to entry
- Must review their training annually

1910.146(k)(1) & Appendix F

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Contractors and Confined Spaces
1910.146(c)(8)-(9)

- Host employer:
  - Inform contractor of hazards/potential hazards
  - Communicate precautions and procedures
  - Coordinate "dual – entry"
  - Consider incompatible jobs and who coordinates
- Contractor:
  - Get information from Host Employer
  - Coordinate "dual-entry"
  - Inform host employer of:
    - Your (contractor) program
    - Hazards confronted/created during entry
  - Inform host employer through a debriefing or during entry

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Other 1910.146 Requirements

- Written Program Required
  - Format provided by OSHA
- Written Permit Required
  - Format provided by OSHA
- Education Required
  - Employers determination
- Record Keeping Required
  - Plan, permits, etc…

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Rescue vs. Recovery

- What is your rescue plan?
  - Rescue in 4 to 5 minutes
    - 50% survival rate
  - Greater than 8 minutes
    - Body recovery
- Everybody Goes Home!!!
- Not About $$$
  - Do you want to tell your co-workers kids their mom or dad is not coming home

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Common Mistakes

- Not knowing OSHA standards
- Not properly training employees
- Not having an attendant
- Not having a rescue plan
- Using your own senses
- Not performing pre-entry testing
- Considering space safe after pre-entry tests
- Not having air monitoring maintenance program
- Not knowing which hazard you might incur

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Questions and Answers

- Call your local dealer or any of the equipment manufactures for help
- Session is meant as a summary
  - A full class would be required for confined space entry
- Thank You!

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