

Permit Required Confined Spaces



29 CFR 1910.146

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Workplace Safety & Health Division – SafetyWorks!



Objectives

- Determine if there are permit required confined spaces at your facility.
- List the requirements of a permit required confined space program.
- Describe rescue procedures.

Scope and Application

- Application
 - **General Industry**
- Excluded
 - **Agriculture**
 - **Construction**
 - **Shipyard Employment**
- Other standards may apply



Identify a Confined Space

- 3 Characteristics
 1. Limited egress
 2. Large enough to enter
 3. Not designed for continuous occupancy



Non-Permit Confined Space

- Confined space that does not contain or, with respect to atmospheric hazard, have the potential to contain any hazard capable of causing death or physical harm



Permit-Required Confined Space

- Has one or more of these characteristics:
 1. Hazardous atmosphere
 2. Engulfment
 3. Inwardly converging walls
 4. Other serious hazards





Measuring Gas Concentrations

Units

Levels

- LEL% (lower explosive limit)
 - Unacceptable Alarm will sound 10%
- CO Carbon Monoxide PPM
 - 50PPM
- O₂ (%) Oxygen
 - Outside the range 19.5% to 23.5%
- H₂S (PPM) Hydrogen sulfide
 - 20PPM

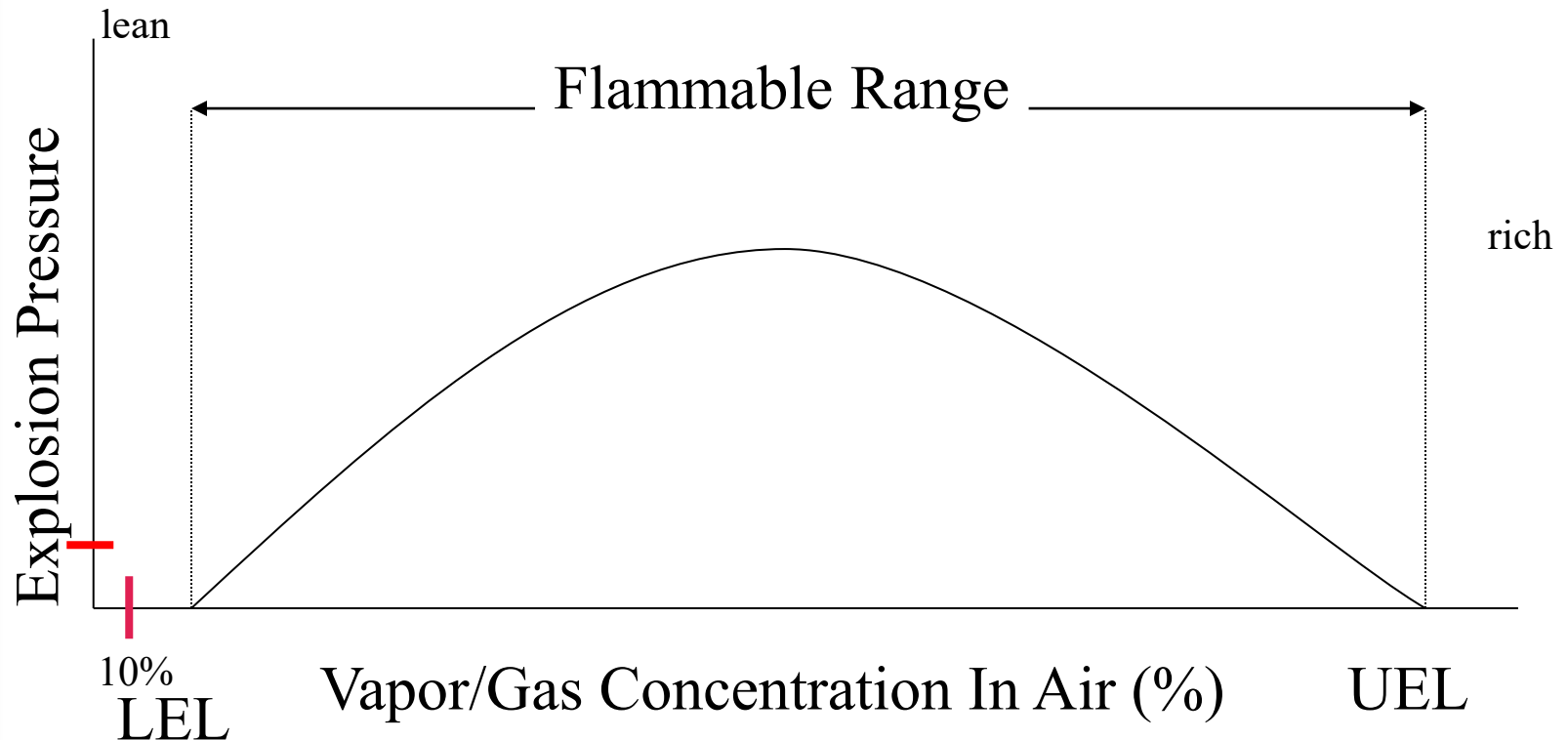
Acceptable Levels

- Oxygen
 - ≥**19.5%** and ≤**23.5%**
- Flammable gas
 - < **10% LEL (lower explosive level)**
- Toxic
 - ≤**PEL (permissible exposure level)**
- Combustible dust
 - < **LEL/LFL (lower explosive level/ Lower flammability level)**



Flammable(Explosive) Limits

Flammable liquid vapor + air + ignition source = explosion



Testing Equipment – Multi gas meter



Calibration of Meters

- Bump (field) test
- Calibration
 - Auto calibration
 - Manual calibration
- Manufacturer requirements



Procedures for Atmospheric Testing

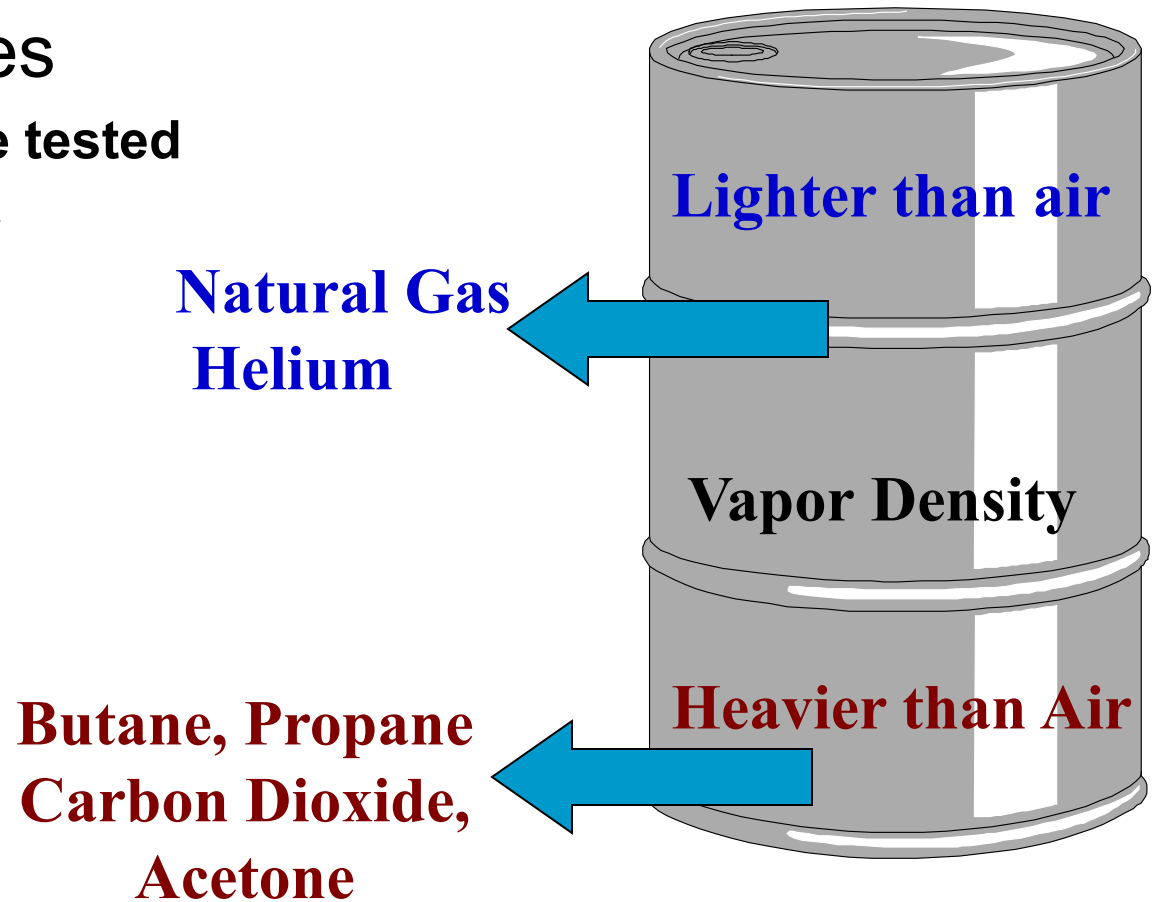


- **Evaluation testing**
 - **Equipment of sufficient sensitivity and specificity to identify hazardous atmospheres**
 - **Data used to establish permit entry procedures**
 - **Reviewed by a qualified professional**
- **Verification testing**
 - **prior to entry**
- **Duration of testing**
 - **Minimum response time of the instrument**

Completed by a qualified professional

Procedures for Atmospheric Testing

- Testing stratified atmospheres
 - atmosphere tested every 4 feet



Procedures for Atmospheric Testing

□ Order of evaluation

- oxygen
- Flammable/combustible gases
- toxic gases/vapors



Employer Responsibilities

- ❑ Evaluate the spaces
- ❑ Inform employees of permit-required confined spaces



Employer Responsibilities

- ❑ Prevent unauthorized entry
- ❑ Written permit space program if entering
- ❑ Alternate procedures
- ❑ Non-PRCS reclassification



Alternate Procedures

- ❑ Only hazard, an actual/potential hazardous atmosphere
- ❑ Continuous forced air ventilation to maintain safe entry



Alternate Procedures

- Monitoring and inspection data indicating safe entry and available to the entrants
- Entry performed in accordance with 1910.146 (c)(5)(ii)



Reclassification

- Non-PRCS to PRCS
 - Changes in use and configuration of Non-PRCS that increase hazards, reevaluate and reclassify to a PRCS



6 foot pump station



Reclassification

□ PRCS to Non-PRCS

- no actual or potential atmospheric hazard
- all other hazards eliminated prior to entering the space
- documentation
- hazards arise, reclassify to a PRCS

Contracted Employee Enter PRCs

- Host employer
 - inform contractor of
 - PRCs
 - PRCs program
 - hazards
 - precautions that are in place
 - coordinated entry
 - debrief at conclusion of entry



Contracted Employee Enter PRCS

- Contractor
 - **comply with PRCS**
 - obtain info on hazards and entry operations
 - coordinate entry
 - inform host employer of PRCS program
 - debriefing at or during entry



PRCS Program

- Prevent unauthorized entry
- Identify and evaluate hazards
- Establish procedures for safe entry



PRCS Program

- ❑ Evaluate before and during entry
- ❑ Provide appropriate equipment



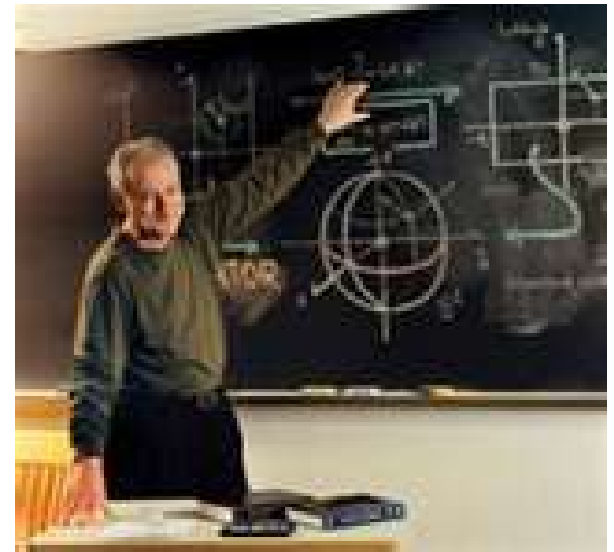
PRCS Program

- ❑ Provide an attendant outside the space
- ❑ Procedure for multiple spaces monitored by one attendant
- ❑ Designate the attendant, entrant(s), entry supervisor



PRCS Program

- ❑ **Establish rescue procedures**
- ❑ **System for preparing, issuing, using, and canceling permits**
- ❑ **Multiple employer entry procedures**
- ❑ **Review entry operations when deficiencies occur**
- ❑ **Review program annually.**



PRCS Program

- ❑ **Multiple employer entry procedures**
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- ❑ **Review program annually.**





Permit System and Entry Permit

- Complete entry permit
- Limited time period
- Made available
- Termination of permit
- Kept for 1 year

Training

- **Train employees to acquire understanding, knowledge and skills:**
 - **Assigned duties**
 - **Change in duties**
 - **Change in confined space characteristics**
 - **Deviations from procedures**



Duties



- Authorized Entrant
- Attendants
- Entry Supervisors

Authorized Entrant

Which duty does not belong?



- Know the probable hazards including symptoms , signs and consequences of exposure
- How to use equipment
- To communicate with Attendants when necessary
- To notify Attendants when a warning of, or hazardous condition exists
- Perform non-entry rescues
- To get out whenever ordered to do so

Attendant

Which duty does not belong



- ❑ **Know the probable hazard Entrants face including symptoms, signs, and consequences of exposure**
- ❑ **Be aware of the possible behavioral effects of exposure on Entrants**
- ❑ **Know the count and ID of authorized Entrants**
- ❑ **Remain outside permit space until relieved by another Attendant**
- ❑ **Maintain communication with Entrants to monitor Entrant status**

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Attendant Continued

- ❑ **Terminate and cancel permits**
- ❑ **Monitor inside and outside the permit space and order exit, if required**
- ❑ **Summon rescue services, if necessary**
- ❑ **Prohibit unauthorized entry**
- ❑ **Perform non-entry rescues**
- ❑ **Not perform other duties that interfere with Attendant duties**





Entry Supervisor

Which duty does not belong?

- ❑ **Know probable hazard(s) of confined spaces**
- ❑ **Verify that all tests have been conducted and that all procedures and equipment are in place before endorsing a permit**
- ❑ **Cannot be an entrant or attendant**
- ❑ **Terminate entry and cancel permits**
- ❑ **Verify availability of rescue services and procedure for summoning them**
- ❑ **Remove unauthorized individual from a confined space**

Rescue and Emergency Services

- On site rescue team
- Off site rescue team
- Non-entry rescue



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On-Site Rescue Team

- ❑ Trained as authorized entrant
- ❑ Trained in PPE and rescue equipment
- ❑ Simulated rescue annually
- ❑ One trained in FA/CPR



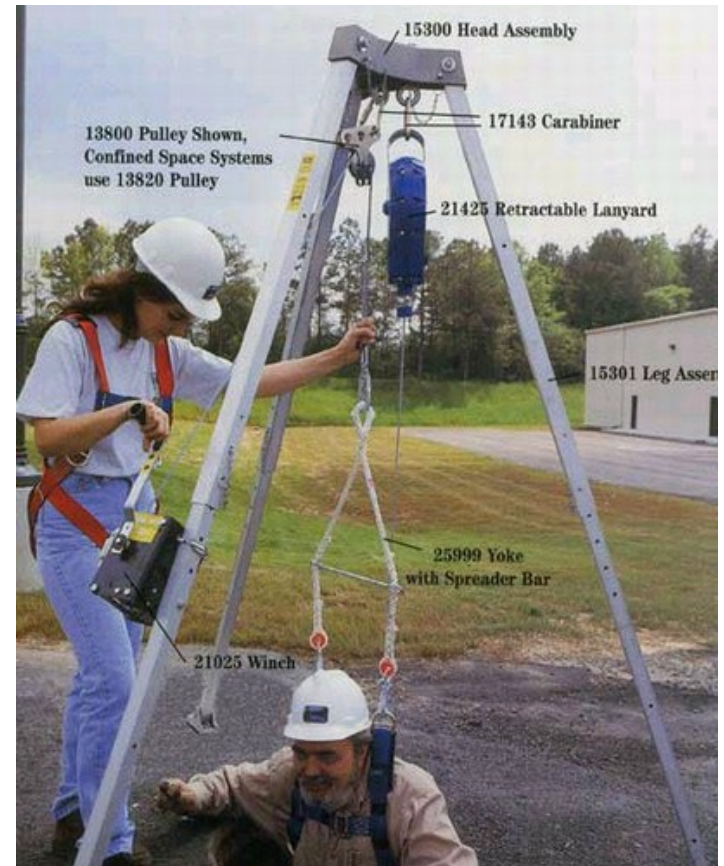
Off-Site Rescue Team

- Evaluate rescue team
 - **timely manner**
 - **proficiency with rescue related tasks and equipment**
 - **equipped**
 - **informed of the hazards**
 - **access to all spaces**



Non-Entry Rescue

- ❑ Retrieval system unless it increases the overall risk of entry
- ❑ Full body harness with retrieval line
- ❑ Wristlets if full body harness is infeasible.
- ❑ Retrieval line attached to a fixed point outside the space





Review

- Determine if there are permit required confined spaces at your facility.
- List the requirements of a permit required confined space program.
- Describe rescue procedures.

QUESTIONS?



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