



Confined Space Entry

ASSE –NOVA Chapter

04/18/2018

Woodbridge, VA





Session Objectives

- **Participants will understand how to classify confined and permit required confined spaces.**
- **Participants will determine the potential hazards associated with confined spaces.**
- **Participants will understand their role and responsibilities during a confined space entry.**
- **Participants will perform entry tasks in a simulated confined space training unit.**

Company fined \$166K for two worker deaths in confined space

Cal/OSHA has issued 16 citations totaling \$166,890 to a recycling company in connection with the deaths of two brothers in a storm drain system.

Armando and Eladio Ramirez, aged 16 and 22, died on Oct. 12, 2011, after inhaling hydrogen sulfide gas while cleaning the storm drain at a Community Recycling and Resource Recovery facility.

All [16 citations](#) addressed the company's failure to have an adequate confined space program, including failure to have: proper employee training testing for atmospheric hazards, and rescue procedures.

The two workers were clearing debris from an obstructed ten-foot shaft in the storm drain system. After Armando lost consciousness from exposure to hydrogen sulfide gas, his brother, Eladio, attempted to rescue him, only to lose consciousness as well. Armando was pronounced dead at the scene. Eladio died in a hospital on Nov. 14, 2011, after being taken off life support.

Grain handling company fined nearly \$260,000 after worker is engulfed in grain bin

OSHA cited Corpus Christi Grain Co. in Corpus Christi, Texas, for 26 violations and fined the company \$258,900 after a worker was engulfed while emptying grain from a storage bin. The employee was rescued due to the exceptional efforts of the Corpus Christi Fire Department. Inspectors found that the company willfully exposed workers to potentially fatal safety hazards by failing to provide personal protective equipment, such as a body harness and life line, to employees working with stored grain; failing to perform lockout/tagout procedures for the energy sources of equipment, such as augers and conveyors, while workers are inside the grain bins; and failing to have a competent attendant present with rescue equipment when workers enter grain storage bins. See the [news release](#) for more information.

Confined Spaces

- <http://www.youtube.com/watch?v=ySwPcOI4W-U&NR=1>.





Confined Space Standards

- **Construction Industry Standard 1926.21(b)(6)**
- **General Industry Standard 1910.146**
- **Grain Handling Standard 1910.272**
- **ANSI Z117.1-2003**
- **NFPA 1607**
- **Best Industry Practices**





OSHA Regulatory

- **1999 Enhance Employee Participation**
 - **Entry Observation of Entry and Monitoring Response**
 - **Requirements for a timely rescue from an IDLH environment.**
 - **Timely- onsite rescue standby for IDLH environments.**





Defining a Confined Space?

Must have all three of the listed criteria:

- **Large enough and so configured that an employee can bodily enter to perform assigned work;**
- **Has limited or restricted means of entry or exit;**
- **Is not designed for continuous employee occupancy**





What is a PERMIT-REQUIRED Confined Space

- Contains material that contains or has the potential to engulf an entrant





What is a PERMIT-REQUIRED Confined Space

- Has an internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls or by a floor which slopes downward and tapers to a smaller cross-section;





What is a PERMIT-REQUIRED Confined Space

**Contains or has
the potential
of any other
recognized
serious safety
or health
hazard**





Reclassification of Permit Required Confined Spaces

- If a confined space does NOT contain atmospheric hazards, it can be reclassified as a non permit required confined space.
- All hazards must have been **engineered** out.
- If a confined space hazard is controlled by administrative methods, the confined space must be treated as a permit required confined space (ANSI Z117.1-2203)



STANDARD SUMMARY

- **Standard requirements to all employers :**
 - **All permit required confined spaces in a facility must be identified by a sign or placard;**
 - **The written plan must be accessible, along with the standard to all employees;**
 - **Proper training for entry supervisors, entrants, attendants, and in-plant rescue team members.**
 - **A confined space rescue plan must be developed when entries are made in IDLH environments and or the hazards cannot be engineered out.**



Confined Space Entry is defined:

**When any
part of the
body breaks
the plan to
the space.**



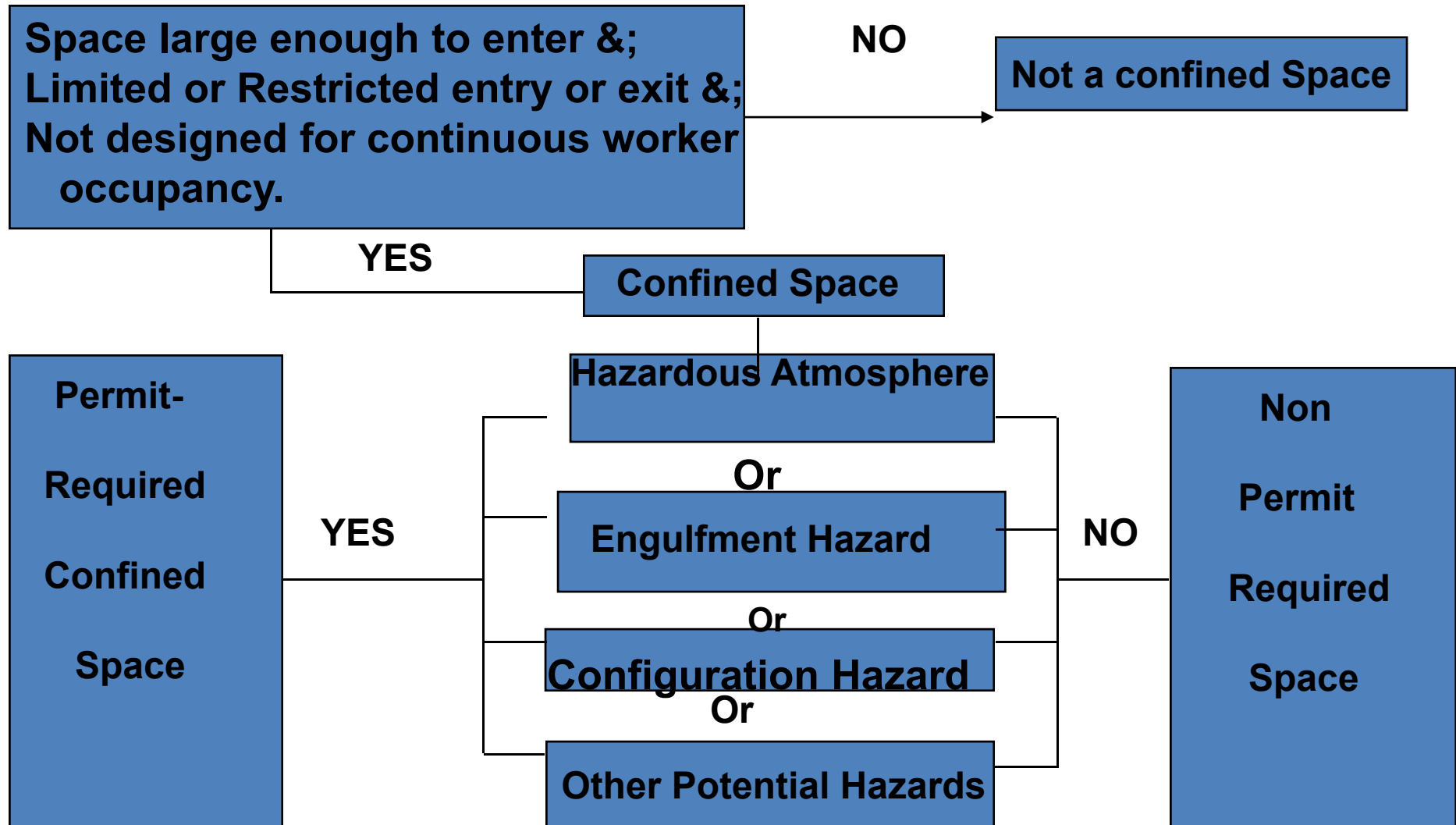
DANGER

CONFINED SPACE

ENTER BY PERMIT ONLY



Categorizing Work Space





Contractor involvement with Confined Space Program

- **Contractors must be informed by the host their site Confined Space Plan.**
 - Hazards Identified and Past Experiences,
 - Precautions and procedures for the site,
 - Permit Required Confined Spaces and, Entry Plan,
 - The host company should obtain from the contractor documentation of training for confined space entry and rescue for each contractor and or sub-contract employee.



Contractor involvement with Confined Space Program

- **Contractors must Comply by obtaining from and or to the host site:**
 - **Available information regarding permit space hazards**
 - **Coordinate entry operation with the host when working at or near a confined space.**
 - **Contractor(s) must provide documentation of confined space entry and rescue training.**

Confined Spaces – Host Employer Responsibilities

- **Host Employer is responsible for:**
 - **Communicating their Confined Space Policy**
 - **Communicate their Permitting system.**
 - **Providing information pertaining to identified spaces and associated hazards.**
 - **A documented review of permit space being entered.**



Confined Spaces – contractor (S)

Responsibilities

- **If your work requires entry into a Host Employer Permit Required Confined Space, the following must occur:**
 - **You must provide your own entry and egress equipment.**
 - **You must provide you own air monitoring equipment.**
 - **This equipment must be inspected and maintained to manufacturer recommendations.**
- **You must provide your own trained attendant(s), entrant(s) and entry supervisor.**

Confined Spaces – contractor (S)

Responsibilities

- If the contract work requires entry into a potential Immediately Dangerous to Life and Health (IDLH) environment, the **contractor (S)** **must provide a rescue plan in writing prior to entering** the Permit Required Space.
- The rescue plan must be in compliance to OSHA 29CFR 1910.146.
- A documented review shall be conducted between the contractor (S) and the Host Employer contact person.

Confined Spaces - Construction

- During a construction phase of a project (building new/modify a structure; excavation activities):
- Contractor (S) will follow OSHA's Subpart AA CFR 1926 for Confined Space when applicable.
- The contractor (S) will provide his/her written programs to the Employer Host Point of Contact. **Prior to entering the space:**
 - provide the name and training records of the Confined Space "Competent person" for the program.
 - provide a written entry plan for the space;
 - provide a written escape plan for the space;
 - provide training records for all parties involve (Entrant, Attendant, Entry Supervisor)
 - provide training records for rescue team.



Typical Confined Spaces

- **Boiler, Degreasers, Furnaces, Mobile Tankers**
- **Pipeline, Pit, Pumping Stations**
- **Reaction or Process Vessel, Mills**
- **Septic Tank, Sewage Digester**
- **Silo, Storage Tank, Barges, Cookers**
- **Sewer, Utility Vault, Manhole, Wells**
- **Trenches, Shafts, Caissons, Ventilation Ducts**







DANGER
PERMIT - REQUIRED
CONFINED SPACE
DO NOT ENTER















Hazards of Confined Spaces

- **Oxygen Enriched & Deficient Atmospheres**
- **Flammable Atmospheres**
- **Toxic Atmospheres**
- **Temperature Extremes**
- **Engulfment Hazards**
- **Noise, Slick/Wet Surfaces, Falls & Falling Objects**
- **Moving Parts**
- **Valves & Pipes**
- **Live Wires/Electrocution**
- **Odd Shapes**





Limited Openings for Entry/Exit

- Openings as small as 18 inches in diameter.
- Difficult to enter with an SCBA or other life-saving equipment.
- Difficult to remove downed worker in folded up or bent over position.
- Exit from large openings may be difficult due to presence of ladders, hoists, ventilation tube, etc.





Not Designed for Continuous Worker Occupancy

- Most confined spaces are not designed to enter and work in on a regular basis.
- Designed to store a product.
- Enclose materials or processes.
- Transport products or substances.
- Occasional worker entry for inspection, repair, cleanup, maintenance, etc.





Unfavorable Natural Ventilation

- Lack of air movement in and out of the space can create an atmosphere much different than the outside atmosphere.
- Deadly gases can be trapped inside.
- Organic materials can decompose.
- There may not be enough oxygen due to the presence of other gases or chemical reactions such as rusting.





Temperature Hazards

- **Extremely hot or cold temperatures.**
- **Steam while cleaning of confined spaces.**
- **Humidity factors.**
- **Cryogenic liquids.**
- **Work processes inside the confined space can affect the temperature.**
- **Personal protective equipment.**



Physical Hazardous Conditions

- **Configuration**
- **Noise**
- **Darkness**
- **Slip, Trip, and Falls**
- **Electricity**
- **Slippery Surfaces**
- **Engulfment**
- **Previously stored products**





Medical Symptoms For Concern

- Loss of muscle control;
- Mental confusion;
- Breathing difficulty;
- Misguided feeling of well-being;
- Ringing in the ears
- Blurred Vision
- Anxiety





Toxic Atmospheres

- Toxic Atmospheres are the - **2nd leading cause of confine space deaths.**
- Vapors enters the blood stream through respiratory system and cause poisoning
- Some gases & vapors are heavier than air & cause greater hazard at lower levels of Confined Space





Oxygen Deficient Atmospheres

19.5 %	Minimum acceptable oxygen level.
15 - 19%	Decreased ability to work strenuously. Impair coordination. Early symptoms.
12-14%	Respiration increases. Poor judgment.
10-12%	Respiration increases. Lips blue.
8-10%	Mental failure. Fainting. Nausea Unconsciousness. Vomiting.
6-8%	8 minutes - fatal, 6 minutes - 50% fatal 4-5 minutes - possible recovery.
4-6%	Coma in 40 seconds. Death



Oxygen Enriched Atmospheres

- Oxygen level above 23.5%
- Causes flammable and combustible materials to burn violently when ignited.
- Hair, clothing, materials, etc.
- Oil soaked clothing and materials.
- Never use pure oxygen to ventilate.
- Never store or place compressed tanks in a confined space.





Carbon Monoxide

- **Odorless, Colorless Gas.**
- **Combustion By-Product.**
- **Quickly collapse at high concentrations.**

<u>PPM</u>	<u>Effect</u>	<u>Time</u>
50	Permissible Exposure Level	8 Hours
200	Slight headache, discomfort	3 Hours
600	Headache, discomfort	1 Hour
1000-2000	Confusion, nausea, headache	2 Hours
1000-2000	Tendency to stagger	1 1/2 Hours
2000-2500	Unconsciousness	30 Min.



Hydrogen Sulfide

- Decomposition of materials. Human waste.
- Rotten egg odor at low concentrations.
- Possibly no warning at high concentrations.

<u>PPM</u>	<u>Effect</u>	<u>Time</u>
10	Permissible Exposure Level	8 Hours
50 - 100	Mild Irritation - eyes, throat	1 Hour
200 - 300	Significant Irritation	1 Hour
500 -700	Unconsciousness, Death	1/2 - 1 Hour
>1000	Unconsciousness, Death	Minutes



Flammable Atmospheres

- **Flammable gas, vapor, mist - concentration of substance where PEL/TLV set occurs if concentration is greater than 10% of its lower flammable limit (LFL)**
- **LFL - minimum concentration of flammable material which will ignite if an ignition source is present. You find this info on the ???????**



Flammable Atmospheres

- **Critical Factors:**
 - Oxygen content in the air.
 - Presence of a flammable gas, or vapor
 - Presence of dust (visibility of 5' or less)
- **Proper air/gas mixture can lead to an explosion**
- **Typical Ignition Sources:**
 - Sparking or electric tool.
 - Welding / cutting operations.
 - Smoking





Odd Shapes



- **Odd Shapes - I.e. sloping sides, floors that taper to a small section, confusing internal shapes that get you lost, trapped which can cause suffocation**
- **Internal baffles and or compartments**



Engulfment

- Loose, granular materials stored in bins and hoppers - grain, sand, coal, etc.
- Crusting and bridging below a worker.
- Flooding of confined space.
- Water or sewage flow.





Hazardous Conditions developed during entries

- Working in and or around the space.
- Rescue operations during emergencies.
- Conditions may change due to work activities:
 - Welding and cutting, use of bonding agents
 - Cleaning with solvents, use of other chemicals
 - Use of gas-powered equipment
 - Weather conditions
 - Temperature changes





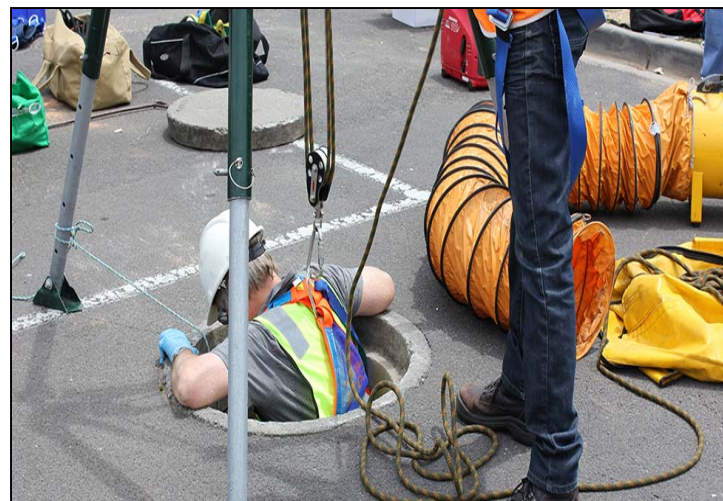
Confined Space Entry Permit Systems

- A system to ensure safe entry and continues through out the entry.
- Written permit signed by the entry supervisor.
- Verifies pre-entry precautions have been taken and the space is safe to enter.
- Posted at entry to confined space.
- Specifies apparent hazards and corrective actions taken prior to entry.
- Requires termination of permit when task is completed or when new conditions exist.



Entry Permit Requirements

- Name and phone numbers of rescue and emergency services.
- Communication procedures.
- Special equipment and procedures.
 - Personal protective equipment.
 - Alarm procedures.
 - Rescue equipment.
 - Respirators.



WORK PERMIT NUMBER:

CONFINED SPACE EVALUATION/PERMIT**SECTION A - GENERAL INFORMATION**

BUILDING/PLANT:

LEVEL:

COORDINATES:

PLANT JOB NUMBER:

EQUIPMENT/SPACE IDENTIFICATION:

TYPE OF OPERATION:

- ☐ Cleaning ☐ Inspection
☐ Repair/Maint. ☐ Construction
☐ Installation ☐ Sampling
☐ Isolation ☐ Other _____

DESCRIPTION OF WORK TO BE PERFORMED IN SPACE/AREA:

SECTION B - CONFINED SPACE/ENCLOSED AREA EVALUATION

WORK SPACE QUALIFIES AS A:

- ☐
- CONFINED SPACE
- ☐
- ENCLOSED AREA

SPACE ORIENTATION:

- ☐ VERTICAL ENTRY OR ☐ HORIZONTAL ENTRY
☐ BELOW GROUND OR ☐ ABOVE GROUND

HAZARDS
OF
SPACE

- ☐ HAZARDOUS ATMOSPHERE ☐ ENGULFMENT
☐ MECHANICAL/MOVING PARTS ☐ ELECTRICAL
☐ SPACE CONFIGURATION/ENTRAPMENT ☐ HEAT STRESS
☐ OTHER

ATMOSPHERIC TEST RESULTS

DATE	TIME	OXYGEN (%) 19.5-23.5	LEL (%) <10	CO (ppm) <25	H ₂ S (ppm) <10	CL ₂ (ppm) <1		ID # OF TESTER	INSTRUMENT ID NUMBER

THE SPACE HAS BEEN EVALUATED AND

☐ IS ☐ IS NOT A PERMIT-REQUIRED SPACE/AREA FOR THIS WORK

SAFETY SIGNATURE:

ID NO:

DATE:

SECTION C - CONFINED/ENCLOSED SPACE ENTRY PERMIT

All Personnel have Completed Confined Space Training	<input checked="" type="checkbox"/> Yes	PRECAUTIONS Natural Ventilation Only Mechanical Ventilation Additional Lighting Explosion-Proof Lights Safety Line and Harness Retrieval Equipment Rescue Procedure Discussed with Workers	REQ'D	DNA
Entry/Exit Points Evaluated	<input checked="" type="checkbox"/> Yes		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Monitoring Required	<input checked="" type="checkbox"/> Continuous <input checked="" type="checkbox"/> Periodic		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Attendant to Worker	<input checked="" type="checkbox"/> Voice <input checked="" type="checkbox"/> Sight <input checked="" type="checkbox"/> Radio		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Communication	<input checked="" type="checkbox"/> Other: _____		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Attendant to ERT	<input checked="" type="checkbox"/> Radio <input checked="" type="checkbox"/> Phone <input checked="" type="checkbox"/> Fire Alarm		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Communication				
Entry Debriefing Required at Completion of Work in Space/Area	<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No			

SPECIAL INSTRUCTIONS:

PERMIT ISSUE DATE:	TIME:	PERMIT EXPIRATION DATE:	TIME:
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PERMIT IS VOID IF CONDITIONS CHANGE FROM ORIGINAL ISSUANCE CONDITIONS**SECTION D - EMPLOYEE SIGNATURES**

I have Read and Understand ALL requirements of this Permit and have been given the opportunity to observe monitoring associated with this Evaluation.

Employee(s) Signature(s)	Badge Number	Date	Entrant/Attendant
1			<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
2			<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
3			<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
4			<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
5			<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>

ATTACH ADDENDUM SIGNATURE SHEET FOR ADDITIONAL EMPLOYEES

NO.	DISTRIBUTION OF COPIES
1	SUPERVISOR'S COPY (TO BE POSTED AT JOB)
2	SAFETY RECORD COPY

ENTRY AUTHORIZATION

Space is Prepared for Entry, All Applicable Worker Qualifications have been Met and are Current (confined space training, lock & tag, respirator training, medically qualified, etc.)

SUPERVISOR IN CHARGE:	BADGE NUMBER:	DATE:
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APPROVAL TO BEGIN WORK *(Atmosphere is Acceptable for Entry)*

SAFETY SIGNATURE:	BADGE NUMBER:	DATE:
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PERMIT TERMINATION *(Work Completed/Job Conditions Have Changed)*

SAFETY SIGNATURE:	BADGE NUMBER:	DATE:
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IN CASE OF EMERGENCY CALL 9-911

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CONFINED SPACE EVALUATION/PERMIT CONTINUATION SIGNATURE SHEET

WORK PERMIT NUMBER:

SECTION D - EMPLOYEE SIGNATURES (employees assigned to job)

I HAVE READ AND UNDERSTAND ALL REQUIREMENTS OF THIS PERMIT.

Employee(s) Signature(s)	Badge	Date	Entrant (or)	Attendant
1			/	/
2			/	/
3			/	/
4			/	/
5			/	/
6			/	/
7			/	/
8			/	/
9			/	/
10			/	/
11			/	/
12			/	/
13			/	/
14			/	/
15			/	/
16			/	/

Confined Space Hazard Assessments

- **CONFINED SPACE ENTRY PLAN**
- **Name of Confined Space:** _____ **Date revised:** _____
- **Location of Confined Space:** _____
- **Description Of Space:**(indicate frequency of entry, nature of entry, is entry horizontal or vertical, etc.)
- Vertical entry with 1 entry point at the top of the tank. No ladder. Tank is approximately 15-20
- ft. deep. Ferric Chloride is added to tank approx. every 2 weeks by outside contractor. Tank is
- filled from outside of the space. No entry.
- **Hazard Classification:** : Permit Required
- **Potential hazards of space:**
- ☐ Oxygen deficiency ☐ Ammonia
- ☐ Combustible gas ☐ Hydrogen sulfide
- ☐ Carbon monoxide ☐ Possible engulfment
- ☐ Energized equipment (LOTO) ☐ Temperature extreme (range: High : Low)
- Other: _____ ☐ Other:
- **Required equipment for entry:**
- : Combustible gas/oxygen meter ☐ Toxic gas monitor (H₂S, NH₃, CO, etc.)
- : Personnel-down alarm ☐ Flashlight 9 Intrinsically safe
- : Radio Intrinsically safe ☐ Ventilation
- : Mechanical Retrieval System (tripod, etc.) : Harness system\Lifeline
- : P.P.E.: (**check all that apply**)
- ☐ Self Contained Breathing Apparatus ☐ Hard Hat
- ☐ Safety glasses ☐ Bump Cap
- ☐ Hearing protection ☐ Other: _____
- ☐ Rain Suit ☐ Air Purifying Respirator
- ☐ Steel toe shoes
- **Required personnel for entry:**
- ☐ : Attendant ☐ : Rescue Team needs to be onsite and accessible
- **Special Entry Procedures/Precautions:**
- Entry into this space of any kind is *strictly prohibited*.
- We are to verify that proper Confined Space Entry procedures are being followed by any
- contractors entering into this space. We are also to inform them prior to entry of our evaluation
- of the space, to include: known potential hazards, past experiences, etc.



Duties of Entry Supervisors

- **Verifies the Entry Permit is completed correctly;**
- **Verifies that all test specified by the permit have been performed and are at acceptable levels;**
- **Verifies rescue services are available and the communication means to them works;**
- **Sign permit allowing entry to begin;**
- **Terminate entry and cancel the permit;**
- **Ensures the removal of unauthorized individuals who enter or attempt to enter the permit space during entry ops;**
- **Determine that entry ops remain consistent throughout entry and acceptable condition are maintained at required intervals and or when responsibility for entry is transferred**
- **Entry supervisor must have the same level of training as an entrant**



Duties of Authorized Attendants

- **Unauthorized Personnel:**
 - **Attendants MUST take the following actions when unauthorized persons approach or enter a permit space while entry is ongoing:**
 - **Warn unauthorized person they must stay away from the permit space;**
 - **Advise unauthorized persons that they must exit IMMEDIATELY if they have entered the permit space;**
 - **Inform authorized entrants and entry supervisor that an unauthorized person has entered the permit space**
 - **An attendant must have the same level of training as the entrant.**



Duties of AUTHORIZED ENTRANTS

- **Communications**
- **Alerting the Attendant:**
 - Entrant recognizes ANY warning sign or symptom of exposure to a dangerous situation;
 - Entrant detects a prohibited condition
- **Evacuating the Space:**
 - Order to evacuate given by the attendant;
 - Entrant recognizes ANY warning sign or symptom of exposure to a dangerous situation;
 - Entrant detects a prohibited condition
 - Evacuation alarm is activated





Testing The Atmosphere

- Verify presence of safe work atmosphere.
- 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 (Below 19.5%)





Testing The Atmosphere

- Meters must test for Oxygen, LEL, and Toxins
- Flammability Meters
- Calibrated before and after use
- Follow manufactures instructions at all times





Ventilation

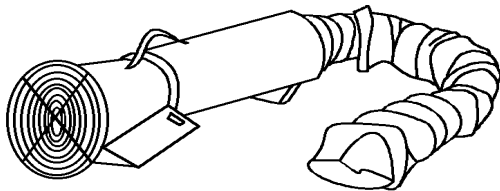
- **First option to correct atmospheric problems.**
- **Must be aware of hazards you are trying to correct in the confined space.**
- **Air intake in a safe location to draw fresh air only.**
- **Continuous ventilation whenever possible.**
- **Retest the confined space before entry and periodically throughout the entry.**





Ventilation

- **Flushing or Purging** - get rid of gases, vapors or airborne impurities;
- **Inerting** - makes the confined space non-flammable, non-explosive, or otherwise chemically non-reactive by displacing or diluting the original atmosphere with steam or a gas that is non-reactive to that space.





Methods of Controlling Energy Sources

- Locking and tagging out electrical sources.
- Blanking and bleeding pneumatic and hydraulic lines.
- Disconnecting mechanical drives and shafts.
- Securing mechanical parts.
- Blanking sewer and water flow.
- Locking and tagging out shutoff valves





Fall Protection Equipment

Class I- Harness that fastens around waist; designed to be used for securing to ladder or emergency escape with one person load. Not approved for confined space work.





Fall Protection Equipment Class II

Class II- Harness that fastens around the waist and around thighs or under buttocks; designed for rescue where two-person loads may be encountered. Not recommended for confined space entry.





Fall Protection

Class Three Harness



- **Class III- Harness that fastens around waist, around thighs or under buttocks, and over the shoulders; designed for rescue where two person loads may be encountered and inverting may occur**



Harness Storage and Care



- Harnesses need to be stored in a clean area.
- Harnesses need to be inspected at least monthly and documented
- Harnesses need to be inspected by the user prior to donning.



Fall Protection Devices





Fall Protection Devices used with Confined Space





Other Protection during Confined Space Entry

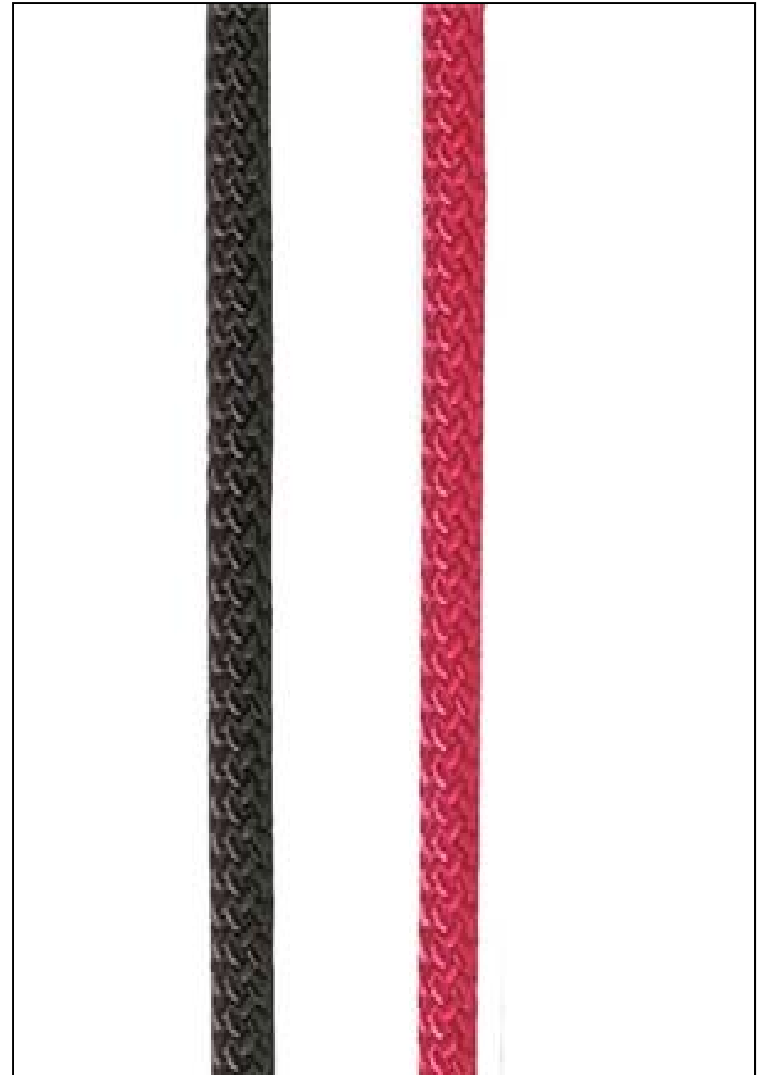
- **Safety Barriers to protect the entrance of the confined space entry area.**
- **Ground Fault Electrical Circuit Interrupters**
- **Electrical adapters for Class II Classifications for Dust Environments**
- **Class I Classifications for Flammable Vapor Environments**





Ropes Classification

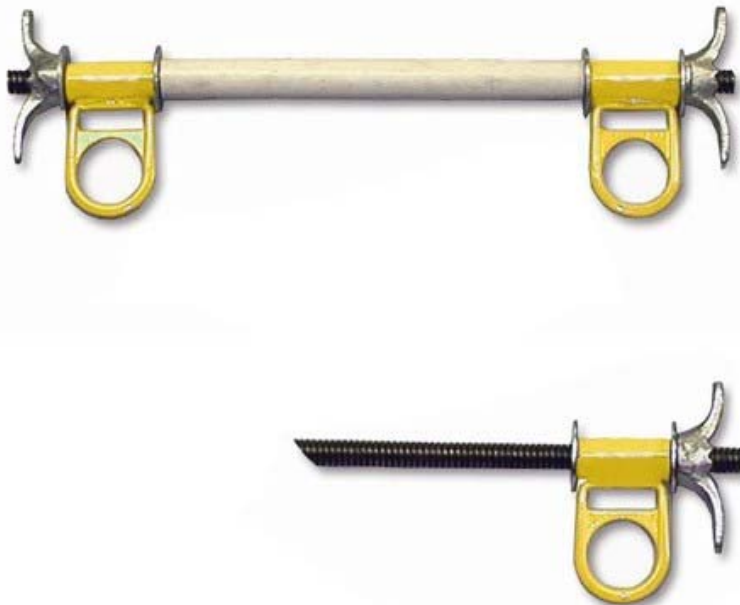
- **Rope used in Confined Space Entry and Rescue**
 - Rope used for fire and rescue must meet NFPA 1923 standards
 - ½ inch or 5/8 inch kernmantle rope is acceptable for life line use.
 - Rope designated for “life Line” should be used for that purpose only.
 - A record of inspection and use must be maintained for all ropes.





Anchor Points

Must hold at least 5000 pounds





Summary

- **Discussed how to classify confined spaces**
- **Discussed the potential hazards of confined spaces**
- **Discussed Confined Space Permit System**
- **Discussed the Role and Responsibilities of the Entry Supervisor, Attendant, and Entrant.**
- **Discussed Monitoring Confined Spaces**
- **Discussed Fall Protection**
- **Discussed Methods to control hazards in confined spaces**



Practical Sessions

- **Participants will have the opportunity to understand the characteristics of confined spaces through the use of a simulated confined space training unit.**
- **Participants will have the opportunity to actively engage by being an entrant, attendant, and or entry supervisor.**
- **Participants will have the opportunity to enter the simulated confined space both horizontal and vertically.**



Practical Session

**Please meet at the
Perdue Safety Training
Unit**



Confined Space Rescue

First Responder



Confined Space Rescue Objectives

- **Participants will understand the requirements of confined space rescue per OSHA 1910.146**
- **Participants will understand between non-entry and an entry rescue.**
- **Participants will participate with a simulated confined space rescue in a controlled training environment.**



Why the need for a confined space rescue plan

- 60% of workers who die in confined spaces are would-be rescuers.
- Deaths from confined space rescues are due to personnel attempting to rescue a co-worker not properly trained.
- Deaths from confined space rescues are due to not having the correct equipment and the readiness of the equipment to perform a rescue.



Why the need for a confined space rescue plan.

- It took six hours for rescue teams to free two workers buried in corn inside a grain bin on N.C. 211 between Clarkton and Council.
- Two of the workers went inside the bin to scrape the walls and stepped into a hollow space in the pile of corn – leaving them trapped inside.
- The third worker tried to pull the other workers out of the bin but was unsuccessful.



Having a rescue plan

- [http://www.youtube.com/watch?v=5nqp-3vcfUA&feature=relmfu.](http://www.youtube.com/watch?v=5nqp-3vcfUA&feature=relmfu)



Confined Space Rescue OSHA Standard Elements

Employers must develop and implement procedures for summoning rescue and emergency services, for rescuing entrants from permit spaces, for providing necessary emergency services to rescued employees, and preventing unauthorized personnel from attempting a rescue 1910.146 (d)(9).



Confined Space Rescue OSHA Standard Elements

- **The employer must evaluate prospective rescuer's ability to respond to a rescue summons in a timely manner, considering the hazard(s) identified.**
- **Evaluate a prospective rescue services ability, in terms of proficiency with rescue related tasks and equipment to function appropriately while rescuing entrants from a permit required.**



Confined Space Rescue OSHA Standard Elements

- **A rescue team or service is to be selected by:**
 - **the ability to reach the victim(s) within a time frame that is appropriate for the permit space hazard(s) identified.**
 - **Is equipped for and proficient in performing the needed rescue services.**



Confined Space Rescue

OSHA Standard Elements

- **Employees designated to perform confined space rescue must be:**
 - **Trained to be proficient as an authorized entrant, be familiar with the hazards of the site confined spaces.**
 - **Trained in the appropriate PPE for performing rescue.**
 - **Affected employees are trained in basic first aid and CPR**
 - **Affected employees practice making permit space rescues at least once every 12 months by means of simulated rescue operations from a representative permit spaces.**



Confined Space Rescue Pre-plan

- **The Pre- Plan should be:**
 - **In writing**
 - **All affected employees must be trained.**
 - **Based off the hazard assessments.**
 - **Included vertical and horizontal type of rescues.**
 - **Reviewed and updated when changes are made to the spaces**
- **Practice one vertical and horizontal plan at least once per year.**



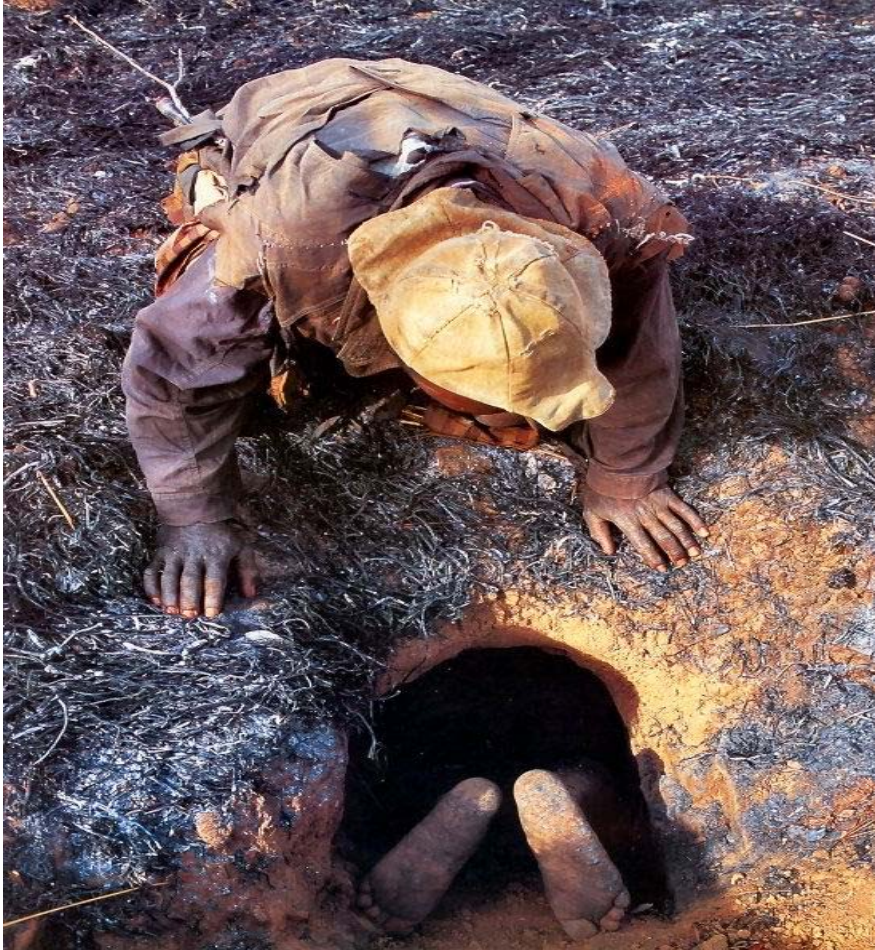
Confined Space Rescue Plan





Confined Space Rescue

Questions to ask



- What is the nature of the incident?
 - Medical
 - Trauma
 - Entanglement
- Can the rescue be accomplished without entering the space?
- Is there vertical and or horizontal challenges



Confined Space Rescue

Questions to ask



- What equipment will be needed to accomplish the rescue?
 - PPE
 - Retrieval/Fall Arrest
 - Hoisting
 - Immobilization
- What resources will be needed to accomplish the rescue? (Internal and External)



Confined Space Rescue

Incident Command System (ICS)

- **Entry Supervisor/Incident Commander**
- **Entry Rescue Team (2 Members)**
- **Back Up Rescue Team (2 Members)**
- **Attendants (2 Members)**
- **SABA Attendant (1 Member)**
- **Support Personnel**





Confined Space Rescue Equipment





Confined Space Rescue Practical

- **Participants will demonstrate the skills learned during the entry and rescue sessions.**
- **Participants will use the ICS structure and complete an entry permit for a simulated rescue.**
- **Participants will demonstrate the skills for a horizontal and vertical first responder rescue.**



Practical Session

**Please meet at the
Perdue Safety Training.**