Is there a Grizzly in your Confined Space?
Maybe not,

But that’s how we should treat them.
Why do we have a Confined Space standard?

- 122 confined space accidents each year lead to 176 fatalities.
- 60% of the fatalities occurred during rescue attempts.
Intended to protect workers from:

• toxic, flammable, explosive, or asphyxiating atmospheres
• possible engulfment
• any other recognized serious hazard (e.g. - hazardous energy)

• The standard focuses on areas with immediate health or safety risks, denoting them as “Permit Required Confined Space”
In other words:

When it comes to confined spaces, you’re guilty until proven innocent.
OSHA assumes every confined space you have requires a permit to get into unless you prove otherwise.
You’ve got to prove AND document the status of every confined space on your property.
Common Confined Spaces

- Scale Pit
- Shredder
- Baler/Logger
- Bag House
- Oil/Water Separator
- Tank
- Z-box
Cyclone
Trommel
How to Identify Confined Spaces

1. Limited Openings for Entry and Exit; AND

2. Is large enough and so configured that an employee can **bodily enter** and perform assigned work; AND

3. Not Designed for Continuous Worker Occupancy
Definition of “Bodily Enter”

• **Bodily enter** means the action by which a person passes through an opening into a confined space. Entry includes ensuing work activities in that space and is considered to have occurred as soon as any part of the entrant's body breaks the plane of an opening into the space.
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
  – Cleaning with solvents, use of other chemicals
  – Use of gas-powered equipment
Permit Required Confined Space

1. Contains or has a 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 by inwardly converging walls or by a floor which slopes downward and tapers to a smaller cross section; or

4. Contains any other recognized serious safety or health hazard.
### Confined Space

1. Limited Openings for Entry & Egress
2. Large enough to bodily enter and perform work
3. Not designed for continuous worker occupancy

### Permit-Required Confined Space

1. Hazardous atmospheres
2. Engulfment
3. Trapped or asphyxiated by inwardly converging walls or by a floor
4. Contains any other recognized serious safety or health hazard
Hazardous Atmosphere

1. Flammable gas, vapor, or mist in excess of 10% of its lower flammable limit (LFL);
2. Airborne combustible dust at a concentration that meets or exceeds its LFL;
3. Atmospheric oxygen concentration below 19.5% or above 23.5%;
4. Atmospheric concentrations of any substance for which a dose or PEL is published in Subpart G or Z of this Part and which could result in employee exposure in excess of its dose or PEL;
5. Any other atmospheric condition that is IDLH
Employers are required to evaluate workplaces to determine if any spaces are permit-required confined spaces.
Employees must be informed of the existence of confined spaces through the use of signs and/or labels.
Entering Permit Spaces

• If employees will enter permit spaces, the employer shall develop and implement a written permit space program

• The written program shall be available for inspection by employee and their authorized representatives
Contractor

- Obtain any available information regarding permit space hazards and entry operations
- Coordinate entry operations with host employer
- Inform the host employer of any hazards confronted or created in permit spaces, either through debriefing or during entry operations
Hazards of Confined Spaces

- Oxygen Deficient Atmospheres
- Oxygen Enriched Atmospheres
- Flammable Atmospheres
- Toxic Atmospheres
- Temperature Extremes
- Engulfment Hazards
- Noise, Slick/Wet Surfaces, Falling Objects
### Oxygen Deficient Atmospheres

<table>
<thead>
<tr>
<th>Oxygen Level</th>
<th>Symptoms</th>
</tr>
</thead>
<tbody>
<tr>
<td>19.5%</td>
<td>Minimum acceptable oxygen level.</td>
</tr>
<tr>
<td>15 - 19%</td>
<td>Decreased ability to work strenuously. Impair coordination. Early symptoms.</td>
</tr>
<tr>
<td>12 - 14%</td>
<td>Respiration increases. Poor judgment.</td>
</tr>
<tr>
<td>10 - 12%</td>
<td>Respiration increases. Lips blue.</td>
</tr>
<tr>
<td>6 - 8%</td>
<td>8 minutes - fatal, 6 minutes - 50% fatal 4-5 minutes - possible recovery.</td>
</tr>
<tr>
<td>4 - 6%</td>
<td>Coma in 40 seconds. Death</td>
</tr>
</tbody>
</table>
Oxygen Deficient Atmospheres

- Exposure to atmospheres containing 12% or less oxygen will bring about unconsciousness without warning and so quickly that individuals cannot help or protect themselves.
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.
Flammable Atmospheres

• The byproducts of work procedures can generate flammable or explosive conditions within a confined space.
Confined Space Testing

FOUR-GAS DETECTOR
- Oxygen content
- Flammability / explosion potential
- Carbon monoxide
- Hydrogen sulfide

CRITICAL ISSUES
- Training
- Procedures
- Calibration
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.
Lockout/Tagout

• First option to eliminate hazards.
• Locking and tagging out electrical sources.
• Blanking and bleeding pneumatic and hydraulic lines.
• Disconnecting mechanical drives and shafts.
• Securing mechanical parts.
• Locking and tagging out shutoff valves.
Ventilation

• 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.
Ventilation Option
Engulfment Hazards

• Material on Feed conveyors
• Fluff
• Flooding of confined space.
• Water or sewage flow.
Authorized Entrants

Entrants must:

- Know the hazards they are facing
- Be able to recognize signs and symptoms of exposure
- Understand the consequences of exposure to hazards
- Communicate with attendants as necessary
- Alert attendants to warning signs or existence of a hazardous condition
- Exit when ordered or alerted
Attendants

Attendants must:

• Be aware of behavioral effects of potential exposures
• Maintain count and identity of entrants
• Remain outside the space until relieved
• Communicate with entrants
• Monitor activities inside and outside the space and order exit if required
Attendants (cont)

Attendants must:

- Summon rescuers if necessary
- Prevent unauthorized entry
- Perform non-entry rescue

Attendants may NOT perform other duties that interfere with their primary duty to monitor and protect!
Entry Supervisors must:

- Issue confined space permits
- Know hazards
- Verify that all tests have been conducted
- Verify that all procedures and equipment are in place before signing a permit
- Terminate entry if necessary and cancel permits
Entry Supervisors (cont.)

• Verify availability of rescue services and means for summoning them
• Remove unauthorized individuals, terminate entry if necessary, and cancel permits
• Coordinate shift change
Permit Entry Systems

• Written permit signed by 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

• Date, location, and name of confined space.
• Purpose of entry and known hazards.
• Duration of entry permit time.
• Authorized entrants, attendants, supervisors.
• Air testing results - signature of tester.
• Protective measures to be taken.
  – Ventilation, Isolation, Flushing
  – Lockout / Tagout, Purging
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.
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.
Training and Education

• Training and emergency drills should be conducted once a year or whenever the procedure or process changes

• Records for training must include:
  – Name of employee(s)
  – Signature of trainer(s)
  – Date(s) of training and
  – Must be retained for 3 years
Sample Confined-Space Entry Permit

ENTRY PERMIT

PERMIT VALID FOR 8 HOURS ONLY. ALL COPIES OF PERMIT WILL REMAIN AT JOB SITE UNTIL JOB IS COMPLETED

DATE: ________________________ SITE LOCATION and DESCRIPTION ______________________________ PURPOSE OF ENTRY ______________________________

SUPERVISOR(S) in charge of crews Type of Crew Phone #

COMMUNICATION PROCEDURES ____________________________________________

RESCUE PROCEDURES (PHONE NUMBERS AT BOTTOM) ___________________________

* BOLD DENOTES MINIMUM REQUIREMENTS TO BE COMPLETED AND REVIEWED PRIOR TO ENTRY*

REQUIREMENTS COMPLETED DATE TIME
Lock Out/De-energize/Try-out _______ _______
Line(s) Broken-Capped-Blanked _______ _______
Purge-Flush and Vent _______ _______
Ventilation _______ _______
Secure Area (Post and Flag) _______ _______
Breathing Apparatus _______ _______
Resuscitator - Inhalator _______ _______
Standby Safety Personnel _______ _______
Full Body Harness w/"D" ring _______ _______
Emergency Escape Retrieval Equip _______ _______
Lifelines _______ _______
Fire Extinguishers _______ _______
Lighting (Explosive Proof) _______ _______
Protective Clothing _______ _______
Respirator(s) (Air Purifying) _______ _______
Burning and Welding Permit _______ _______

Note: Items that do not apply enter N/A in the blank.

**RECORD CONTINUOUS MONITORING RESULTS EVERY 2 HOURS**

CONTINUOUS MONITORING** Permissible TEST(S) TO BE TAKEN Entry Level

PERCENT OF OXYGEN 19.5% to 23.5% ___ ___ ___ ___ ___ ___ ___ ___
LOWER FLAMMABLE LIMIT Under 10% ___ ___ ___ ___ ___ ___ ___ ___
CARBON MONOXIDE +35 PPM ___ ___ ___ ___ ___ ___ ___ ___
Aromatic Hydrocarbon + 1 PPM * 5PPM ___ ___ ___ ___ ___ ___ ___ ___
Hydrogen Cyanide (Skin) * 4PPM ___ ___ ___ ___ ___ ___ ___ ___
Hydrogen Sulfide +10 PPM *15PPM ___ ___ ___ ___ ___ ___ ___ ___
Sulfur Dioxide + 2 PPM * 5PPM ___ ___ ___ ___ ___ ___ ___ ___
Ammonia *35PPM ___ ___ ___ ___ ___ ___ ___ ___

* Short-term exposure limit: Employee can work in the area up to 15 minutes.
+ 8 hr. Time Weighted Avg.: Employee can work in area 8 hrs (longer with appropriate respiratory protection).

REMARKS: ________________________________________________________________

GAS TESTER NAME _______ INSTRUMENT(S) _______ MODEL _______ SERIAL &/OR &/OR TYPE UNIT #
& CHECK # _______ & CHECK # _______ &/OR TYPE UNIT #

SAFETY STANDBY PERSON(S) PERSON IS REQUIRED FOR ALL CONFINED SPACE WORK

SAFETY STANDBY CHECK # CONFINED CONFINED
PERSON(S) SPACE CHECK # SPACE CHECK #
ENTRANT(S) ENTARNT(S)

SUPERVISOR AUTHORIZING - ALL CONDITIONS SATISFIED DEPARTMENT/PHONE

AMBULANCE 2800 FIRE 2900 Safety 4901 Gas Coordinator 4529/5387
Reclassification Form for Permit-Required Confined Space
For Potential Lockout Hazards Only

Permit Confined Space can be reclassified into a non-permit confined space if:

1. The space does not contain actual or potential atmospheric hazards:
   Examples: If you are torching or welding you could create an atmospheric hazard. If you are welding or torching complete both sides of this form.

If you are using any chemicals then the space is permit required.

If you must enter the permit confined space to lockout, tagout, blankout or block any hazard then a confined space entry permit must be completed.

The permit is valid only while the confined space remains free from hazards. If hazards arise during the course of entry, the space must be evacuated immediately and re-evaluated for hazards.

The reclassification is valid only for the specific entry indicated below.

__________________________________________________________________________________________

Location

__________________________________________________________________________________________

Space Description: Baler Box and Ram Area / Shear Box and Shear Area
Shredder Mill / Shredder UMO / Scale Pit

Other: __________________________________________________________________________________

Purpose of entry: Cleaning / General Maintenance / Inspection / Weld/Torch

Other: __________________________________________________________________________________

<table>
<thead>
<tr>
<th>Originally In Space (Iatational, Fall, etc)</th>
<th>Methods of Elimination of Hazard</th>
<th>Verified By</th>
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</tbody>
</table>

Comments: __________________________________________________________________________________

__________________________________________________________________________________________

Certified By: ________________________________ Date: ________________________________

Entrant(s): ____________________________________________________________

Print                          Initials                          Print                          Initials

This form must be maintained by the plant for inspection for 1 year.
Confined Space Reclassification Form
For Welding /Torching Operation or Potential Toxic Spaces

Location of Confined Space (be specific) _____________________________________

Complete the following PRIOR to entry into each confined space considered for reclassification to a non-confined space. If any of the questions below are answered yes, describe how the hazard has been eliminated.

Description of work activity: ___________________________________

Atmospheric conditions:

1) Are there any potential for an oxygen enriched atmosphere caused by leaking tanks, hoses, etc? Y N
2) Are there any potential for toxic contaminants i.e.: carbon monoxide, hydrogen sulfide, methane, etc? Y N
3) Are there any potential for an explosive or flammable atmosphere (leaking pipes, hoses, etc – Propane, Acetylene, painting or cleaning chemicals?) Y N

Atmosphere in the area of the space create a hazardous atmosphere as explained above?

Y N

That all known or potential hazards have been appropriately eliminated prior to entry into the space, thereby allowing for the reclassification of the space as a Non-Permit Confined Space.

Reclassification Authorization By: _________________________________________________________

Print Signature Date / Time

If at any time during the entry the hazards change entrants MUST immediately vacate the space.

Time Location of reading % Oxygen 19.5 – 23.5% % LEL Below 10% Carbon Monoxide Below 35 ppm Notes i.e. – pre entry reading, start of work, closed...

Atmosphere Tested By: Initials.

Ion / Model Serial Number Calibration Date

Comments / Problems or Hazards found: _________________________________________________________

_______________________________________________

Job completed and all employees out of space at ______________________

Final inspection by: _________________________________________________________________________

Print Signature Date

Entrants: _______________________/ ___________________________________________ / _______________________________________

Print Initials Print Initials Print Initials

This form must be maintained by the plant for inspection for 1 year.
RESCUE
The Necessity of Rescue

• Entrants are in spaces that could quickly render them unconscious
• Over 60% of fatalities in confined spaces are would-be rescuers
• A pre-planned and effectively executed rescue saves lives
• Entry programs that by-pass safeguards will eventually end up requiring rescue
Rescue Members are Trained:

• To perform assigned duties
• As entrants
• In first aid and CPR (at least one member holds current certification)
• To be proficient in use of personal protective equipment
• To practice rescue at least once every 12 months
Questions?

THANK YOU!

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