Grain Bin and Confined Space Entry

OSHA 1910.272 & 1910.146

NGFA – AAI Safety Seminar
Johnston, IA

Presenter: Jim Maness, JEM Consulting

June 13, 2013

Source: Bill Field, Purdue University

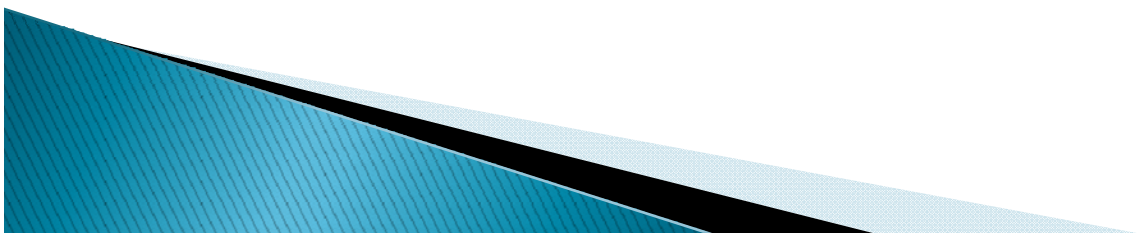
August 4, 2010 Speech, Dr. David Michaels, Head of OSHA

"OSHA has investigated several cases involving worker entry into grain storage bins where we have found that *the employer was aware of the hazards* and of OSHA's standards, *but failed to train or protect the workers* entering the bin," wrote OSHA Administrator David Michaels.

In an August 4th, 2010 Letter, Dr. David Michaels Stated:

"*We are putting these employers on notice. OSHA will use the full extent of the law to ensure that any employer who violates these standards is held accountable for its lack of concern for worker safety*."

OSHA states they will consider referring all future cases that involve grain engulfment fatalities to the Department of Justice for criminal prosecution.



How are Confined Spaces Regulated?

Confined Space Entry

- 1910.146
- Promulgated 1993.
- Applies to all industries who have permit required confined spaces.
- Does not apply to grain storage structures.

Grain Storage Structure Entry

- 1910.272 (g) & (h)
- Promulgated 1987.
- Revised 1996.
- Applies to grain storage structures.
- Grain industry specific.

What is a Confined Space?

OSHA 1910.146:

- Has a size & shape that allows a person to enter and work.
- Has a limited or restricted opening for entry & exit.
- Is not designed for continuous human occupancy.

Examples of Confined Spaces Potentially Found at Grain Locations*

- Liquid storage tanks
- Scales / Garners
- Hoppers
- Receiving Pits
- Rail cars, barges
- Distributors (turn heads)
- Dust control systems
- Tunnels
- Boot pits
- Manholes
- Vaults
- Sewers
- Equipment or space you can enter to work. (e.g. legs, conveyors, mixers)
- Extractor

* Grain storage spaces are regulated under 1910.272 g & h. OSHA's grain handling standard and includes bins, silos, tanks, and flat storage locations where grain is stored.

Non-Permit Confined Space

- A confined space that does not contain or, with respect to atmospheric hazards, have the potential to contain any hazard capable of causing death or serious physical harm.
- “Maybe” Examples:
  - Boot pits, tunnels, basements, control rooms, etc.

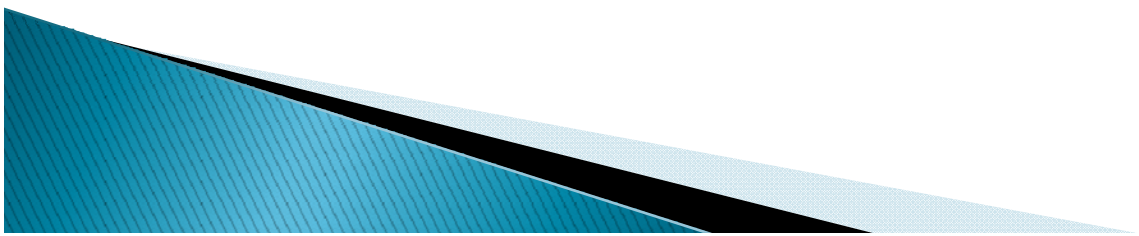
Permit Required Confined Space

- Contains or has the potential to contain a *hazardous atmosphere.* *OR*
- Has the *potential to engulf* an occupant by a liquid or finely divided material. OR
- Has *inwardly converging walls* or a *floor that slopes downward.* *OR*
- Any other characteristic recognized as a *serious safety or health hazard* such as a mechanical hazard.
- All confined spaces must be considered permit-required until proven otherwise!
- www.osha.gov then search for Confined Space Advisor

Potential Hazards in Confined Spaces

- Atmospheric
- Mechanical
- Electrical
- Other hazards
  - Engulfment
  - Falling objects
  - Harmful substances or residues
  - Noise
  - Temperature

- Conditions that exist or may develop
- Examples:
  - Oxygen enrichment or deficiency
  - Engulfment & entrapment
  - Lockout & isolation
  - Weather, electrical, etc.



Atmospheric Hazards

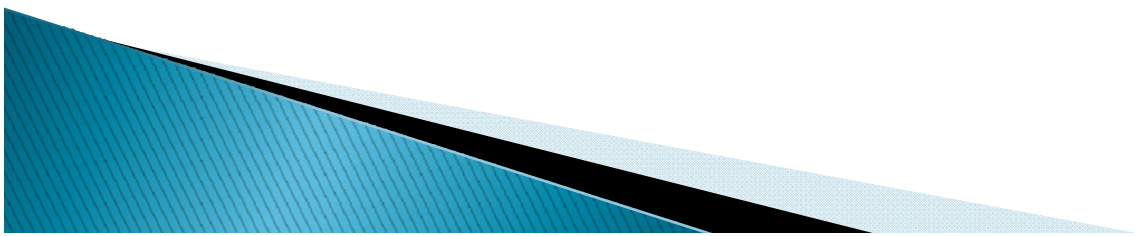
- Oxygen Conc. <19.5% or >23.5% (too much or too little oxygen)
- Flammable gases greater than 10% LEL
- Carbon monoxide >25 ppm
- Hydrogen sulfide >10 ppm
- Exposure to toxins above their P.E.L.
  - Phosphine 0.3 ppm
- Dust obscuring vision to $\leq$5’

Air Monitoring Equipment for Atmospheric Hazards

- Air monitoring equipment must be equipped with an alarm to inform of sensor or equipment failure.
- Use manufacturer's specifications to calibrate and maintain air monitoring device, and certify employees to perform testing.
- Air monitoring must detect the following gases:
  - Oxygen (O_2) (19.5%-23.5%)
  - (LEL) Flammable gases-Methane (CH4)
  - Carbon Monoxide (CO) (<25ppm)
  - Phosphine (PH_3) (<.3ppm)

Mechanical Hazards

- Mechanical equipment presents the potential for injury when there is contact with the worker
  - Mechanical equipment:
    - Bin sweeps
    - Reclaim conveyors
    - Augers
    - Slide gates
    - Shovel machine cables
    - Fill and discharge equipment
    - Tractors or other Powered Industrial Trucks



Written Confined Space Program

- Make an evaluation of all confine spaces.
- Compile a list of all confined spaces. Use OSHA's Confined Space Advisor or do a hazard evaluation of each space to determine whether it is a permit or non-permit required space.
- Place signs on all Permit Required confined spaces.

Hazard Evaluation of Spaces

A hazard analysis for affected space at your location must be conducted

HAZARD EVALUATION OF CONFINE SPACES Page 1 of 2

Name of Space:	Location:
Place of Entry Into Space:	

Entry into the above listed permit space requires compliance with the checked items that follow during normal entry situations. This checklist should be reviewed prior to issue of a permit to ensure the space is properly prepared and the entrants are aware of the hazards within. This (These) confined space(s) has (have) the following potential hazards that will need to be checked and/or controlled during entry.

☐ Engulfment Atmospheric: ☐ Respirable ☐ Flammable
☐ Electrical ☐ Mechanical (moving equipment)
☐ Other (List converging walls, falls, hot surfaces, etc.)
☐ List harmful substances (steam, acids, caustic, chemicals, etc__ _

REQUIRED CHECKS FOR AIR CONTAMINANTS

Enter a check in the space provided if the contaminant may be present in the space:
Numbers in parentheses show PEL/TLV.

☐ Ammonia (35 ppm)
☐ Carbon Monoxide (35 ppm)
☐ Hydrogen Sulfide (10 ppm)
☐ Sulfuric Acid (1 mg/m^3)
☐ Welding fumes (5 mg/m^3)
☐ Propane (1000 ppm)
☐ Gasoline (300 ppm)
☐ Carbon Dioxide (5000 ppm)
☐ Airborne dust (visible or opaque)
☐ Methane (5530 ppm)
☐ Other _____

☐ One of the following insecticides/fumigants: (circle one) ACTELLIC / RELDAN (.1 mg/m^3) / MALATHION (15 mg/m^3) / PHOSPHINE (.3 ppm) / METHYL BROMIDE (15 ppm) / OTHER _____
☐ MSDS ON FILE FOR THE CONTAMINANTS LISTED. IF NOT, OBTAIN PRIOR TO ENTRY

ATMOSPHERIC CONTROLS

The following are controls for potential atmospheric hazards such as air contaminants, oxygen deficiencies or flammable gases, vapors or dust. These can be utilized for entry during **routine shutdowns and other controlled entries**.

Control Methods:	Natural Ventilation Provided:	Forced Ventilation Provided:
☐ Air purged	☐ Open doors	☐ Purge blower
☐ Steam purged	☐ Hatches/Portals	☐ Ventilation fans
☐ Water wash	☐ Gates	☐ Exhaust fans
☐ Other _____	☐ Other_____	☐ Dust collection system

ISOLATION The following methods are to be used to isolate entrants from potential hazards posed by mechanical, electrical, engulfment or harmful substances.

List starters, other electrical equipment and locations that shall be locked and tagged out:
1._____ 2._____ 3._____4._____5._____ 6._____

List the valves and locations that shall be locked and tagged out:
1._____ 2._____ 3._____4._____5._____ 6._____

List the lines and their locations to be isolated and the isolation method (disconnected, blanked or blinded):
1._____ 2._____ 3._____4._____5._____ 6._____

List gates to be locked and tagged closed to prevent harmful substances from contacting or engulfing entrants:
1._____ 2._____ 3._____4._____5._____ 6._____

List the locations that shall have barriers, rope or safety tape installed to control vehicles and pedestrians:
1._____ 2._____ 3._____4._____5._____ 6._____

List other energy sources and their locations to be isolated:

1._____ 2._____ 3._____4._____5._____ 6._____

REQUIRED EQUIPMENT

Determine which of the following special safety equipment is typically required for entry into this space. If special conditions exist, such as the presence of hazardous chemicals, engulfment potential, or other mechanical hazard, the entry supervisor shall determine what additional personal protective equipment is required to ensure safe entry into the space.

Personal Protective Equipment

- ☐ Harness and safety line
- ☐ Mechanical winch
- ☐ Respiratory equipment
  - ☐ Dust/mist mask
  - ☐ Half mask for _____
  - ☐ Full-face mask for _____
  - ☐ Air line respirator for _____
- ☐ Gloves for _____
- ☐ Eye protection
  - ☐ Safety glasses
  - ☐ Safety Goggles
  - ☐ Full face shield

Atmospheric Monitoring Equipment

- ☐ Oxygen meter
- ☐ Combustible gas meter
- ☐ Indicator tube and pump for _____

Illumination

- ☐ Rated drop light
- ☐ Rated flash light
- ☐ Other _____

Rescue Equipment (need not be at the space, but should be readily obtainable)

- ☐ Emergency oxygen
- ☐ Stretcher
- ☐ Harness, Ropes, etc
- ☐ Mechanical winch
- ☐ First aid kit ☐ Stretcher
- ☐ SCBA(s)
- ☐ Grain Rescue Tube _____
- ☐ Other _____

Miscellaneous Equipment

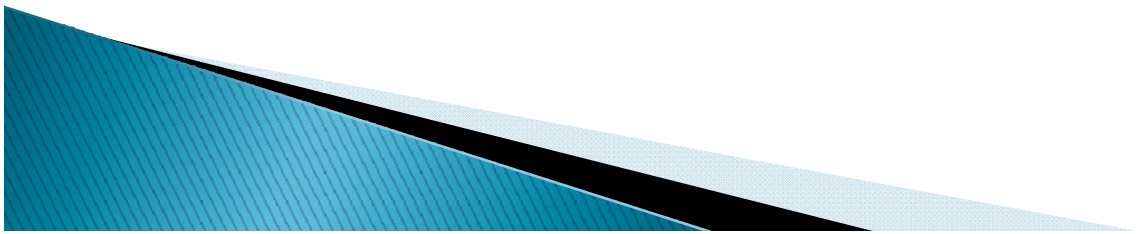
- ☐ Radios
- ☐ Phone
- ☐ Intercom
- ☐ Other _____

Type of Space based on this evaluation (circle one and record on Appendix A)
Permit required Confine Space
Reclassified confine Space
Confine space using Alternate Method
Grain storage space with grain.

EVALUATED BY: _____
DATE: _____

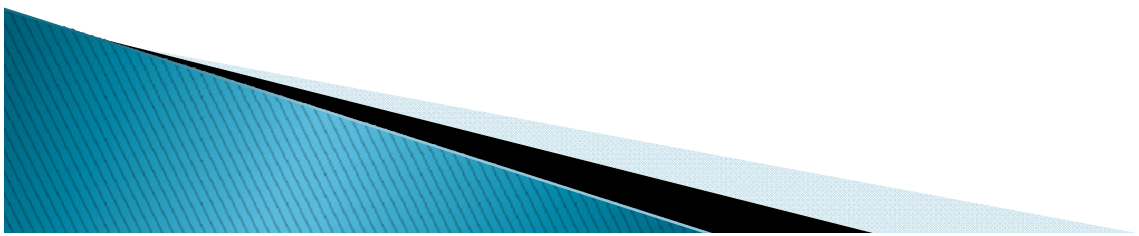
Written Confined Space Program

- Establish procedures for safely entering and working in the space.
- Train all affected workers regarding hazards and their duties to avoid hazards.
  - Train entry supervisors, attendants and entrants.
  - Certify the training with each worker signing that they were trained.
- Describe your confined space rescue plan.
- Obtain needed equipment including meter to measure for air quality, harnesses, lifelines, hoists, etc.
  - Get a grain rescue tube to aid in rescue.
- Determine if any spaces can be reclassified as a non-permit space thru 1910.146(c)(7)



Reclassified Permit Required Space
1910.146(c)(7)(ii) & (iii)

- If there is no atmospheric hazard in a space **and** if all hazards are eliminated without entry into the space, it can be reclassified.
- If so, the space can be entered as a normal space once the hazard is eliminated or shown not to exist.
- You can also use an alternate procedure for working in a space with forced air ventilation to eliminate an atmospheric hazard.
- Reclassification must be documented for each entry.



Reclassification of Permit Required Space

- If it is necessary to enter the permit space to eliminate hazards, such entry shall be performed "using Confined Space Entry procedures". If testing and inspection during that entry demonstrate that the hazards within the permit space have been eliminated, the permit space may be reclassified as a non-permit confined space for as long as the hazards remain eliminated.

PERMIT REQUIRED CONFINED SPACE RECLASSIFICATION PERMIT

This permit is to be completed if the Permit Required Confined Space (PRCS) is to be reclassified as a Non-Permit Confined Space. This can be done **ONLY** if:

1. The PRCS is indicated as subject to reclassification in the Inventory, and;
2. The hazards identified on the Confined Space Inventory have been eliminated.

List the reclassification steps below and sign when the step is completed. Have the area and equipment reviewed and approved by your supervisor. Place this permit in the work area in a prominent location.

Confined Space ID: _____ Date: _____

Reclassification Steps	Completed by:

RECERTIFICATION APPROVAL

I HAVE VISUALLY INSPECTED THIS PERMIT-REQUIRED CONFINED SPACE AND CERTIFY THAT THE REQUIRED STEPS TO RECLASSIFY AS A NON-PERMIT CONFINED SPACE HAVE BEEN PROPERLY COMPLETED.

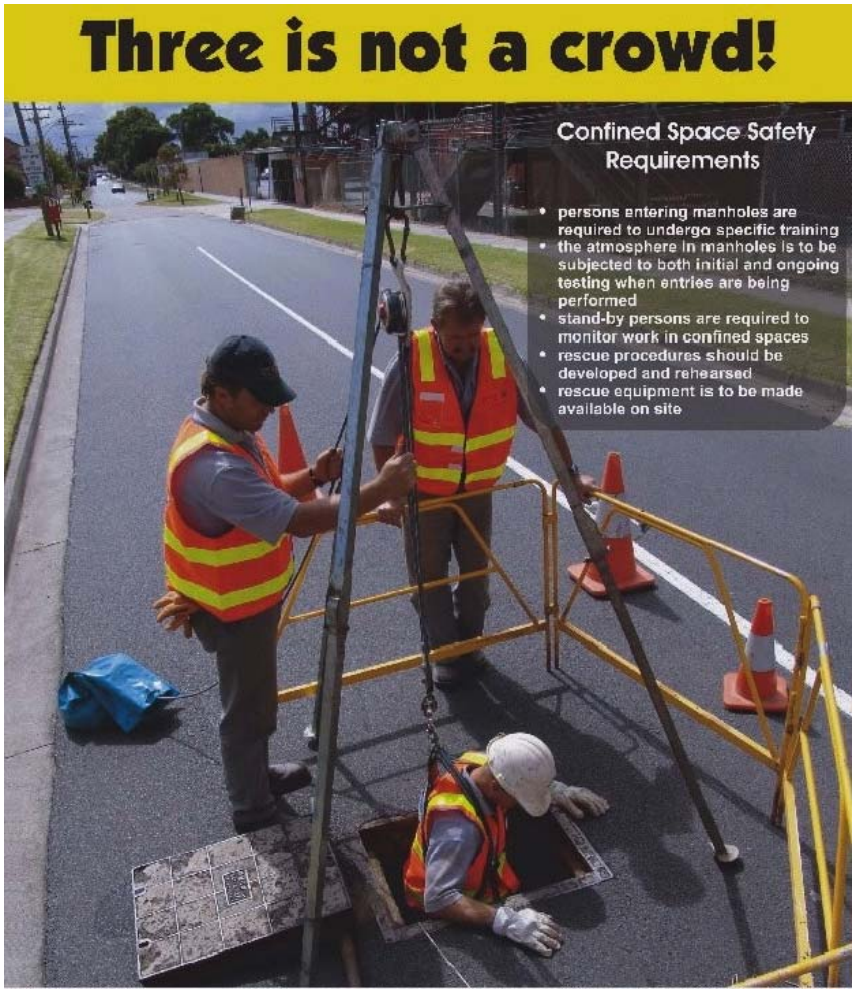
Signature: _____ **Date:** _____
Entry Supervisor

Comments and any problems encountered:	

Keep this form on file for a period of 12 months.

Roles and Duties

- Train the workers in their duties to ensure safe entries.
  - Entry Supervisor
  - Attendant
  - Entrant

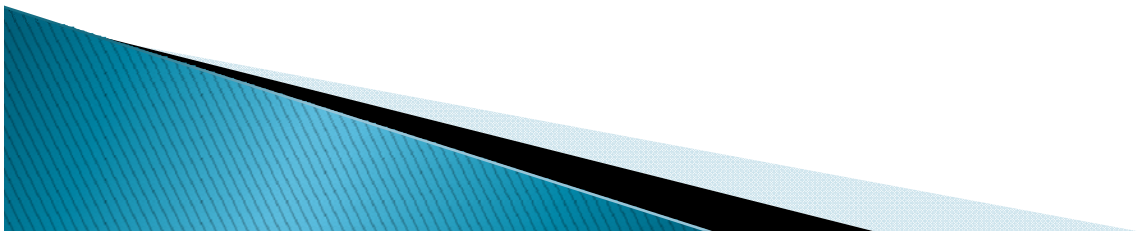


Entry Supervisor & Responsibilities

- Know the potential hazards of confined space entry.
- Personally inspect the confined space to be entered.
- Verify that all permit requirements have been met, including atmospheric testing, protective equipment, and proper authorization.
- Ensure that the safe work plan and rescue plan has been discussed with all involved employees.
- Ensure that entry and operations are within the terms of the entry permit and entry conditions are maintained.
- Ensure that the entrant and attendant fully understand their respective responsibilities.

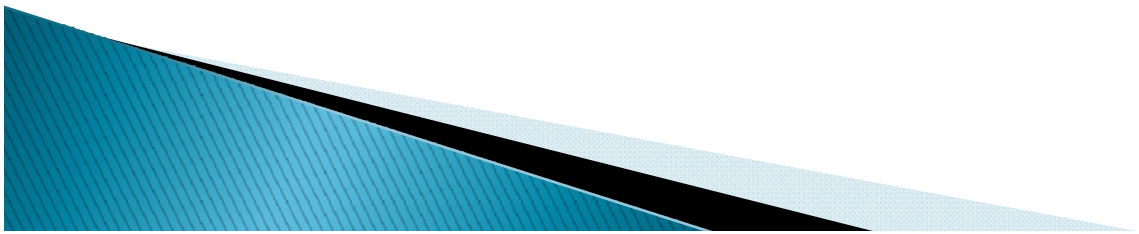
Entry Supervisor Responsibilities

- Complete the permit and receive proper authorization.
- Monitor the entry operation for potential hazards due to changing conditions and terminate the permit if unsafe conditions arise.
- Must be familiar with facility design and operation.
- Must be on-site during the entire entry.
- *The entry supervisor may also serve as the attendant or entrant if he/she is properly trained and equipped for the task.*
- Responsible to terminate the permit if hazardous conditions so dictate.



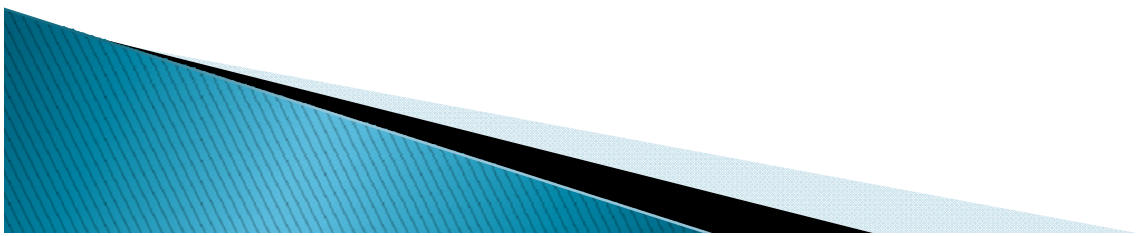
Attendant & Responsibilities

- Monitor entrants during the job and during entry & exit to help ensure their safety.
  - The attendant may not abandon his/her post for any reason while personnel are in the space unless relieved by another qualified attendant.
- Recognize and distinguish the hazards that may exist during the entry.
- Be able to recognize the signs and symptoms of exposure.
- Communicate with entrants to monitor their status and any possible affects of hazards.



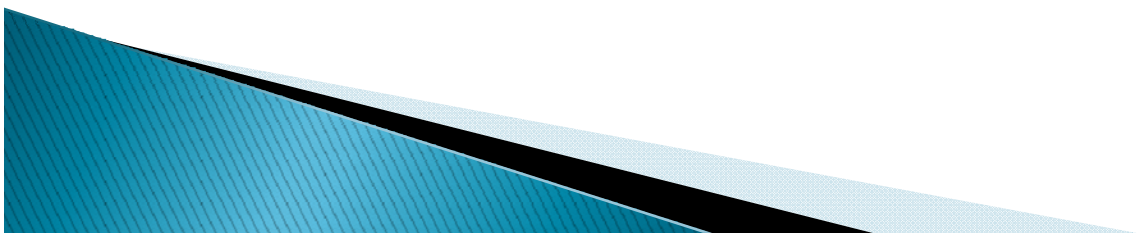
Attendant Responsibilities

- Alert entrants of any hazards or conditions that would make an evacuation necessary.
- These conditions may be:
  - A prohibited condition is detected.
  - A change in atmospheric condition.
  - A change in material condition.
  - An entrant show signs of exposure.
  - The attendant cannot effectively and safely perform duties, or communication with or between entrants is lost.
  - An endangering situation is detected outside of the space.



Attendant Responsibilities

- Monitor conditions inside and outside the space to determine if it is safe for entrants to remain in the space.
- Ensure that no unauthorized workers enter the permit space.
- Ensure there is a means of communications to summon help is available and working properly.
- Initiate the procedures to summon rescue and emergency services.



Citation 2 Item 2 Type of Violation: Willful

29 CFR 1910.272(g)(3): In the grain handling facility an observer, equipped to provide assistance, was not stationed outside the bin, silo, or tank being entered by an employee:

a) On or about and times prior to November 8, 2011, at the [redacted] facility, the employer did not ensure that employees who entered grain storage bins were protected from bin entry hazards because an observer, equipped to provide assistance in an emergency, was not always stationed outside the bin entered by employees.

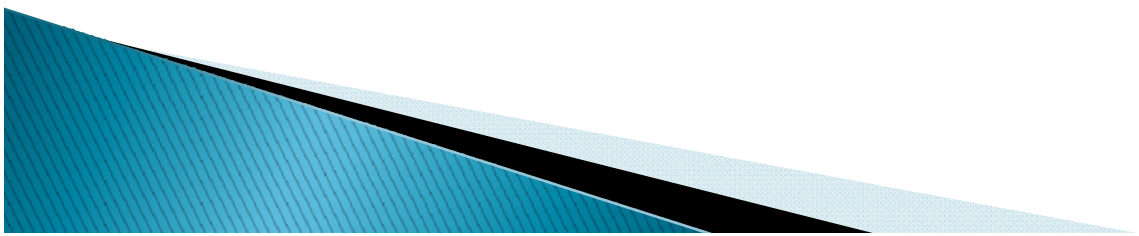
ABATEMENT CERTIFICATION AND DOCUMENTATION ARE REQUIRED.

Date By Which Violation Must be Abated:	05/28/2012
Proposed Penalty:	$ 38500.00

Robert E. Vazzi
Area Director

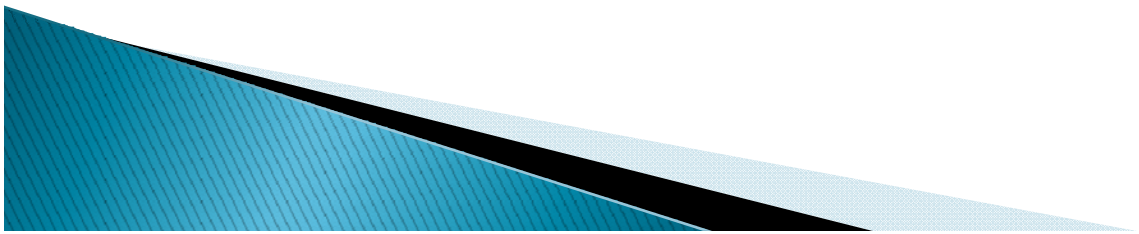
Entrant & Responsibilities

- Know and identify potential hazards of the confined space and terminate the permit and exit the space if conditions are detected.
- Be aware of and avoid mechanical and engulfment hazards.
- Recognize and distinguish signs and symptoms of exposure.
  - Difficulty concentrating and loss of coordination.
  - Feeling faint, dizzy, confused or passes out.
- Identify the consequences of exposure hazards.



Entrant Responsibilities

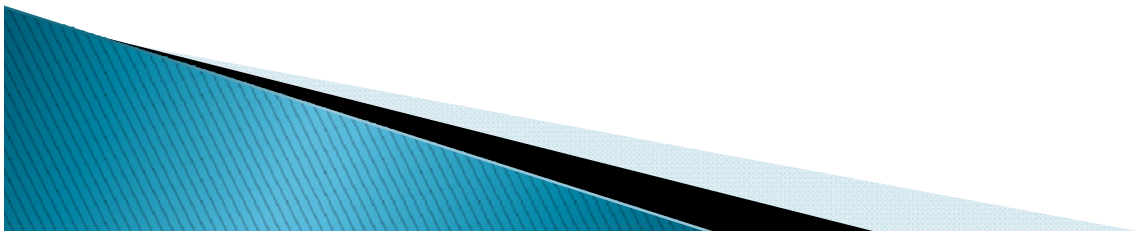
- Know how to use the equipment necessary to complete the task.
- Continuously communicate with attendant and, if necessary, alert attendant.
- Know how to exit the space.
- Continuously monitor the space for potential hazards due to changing conditions.



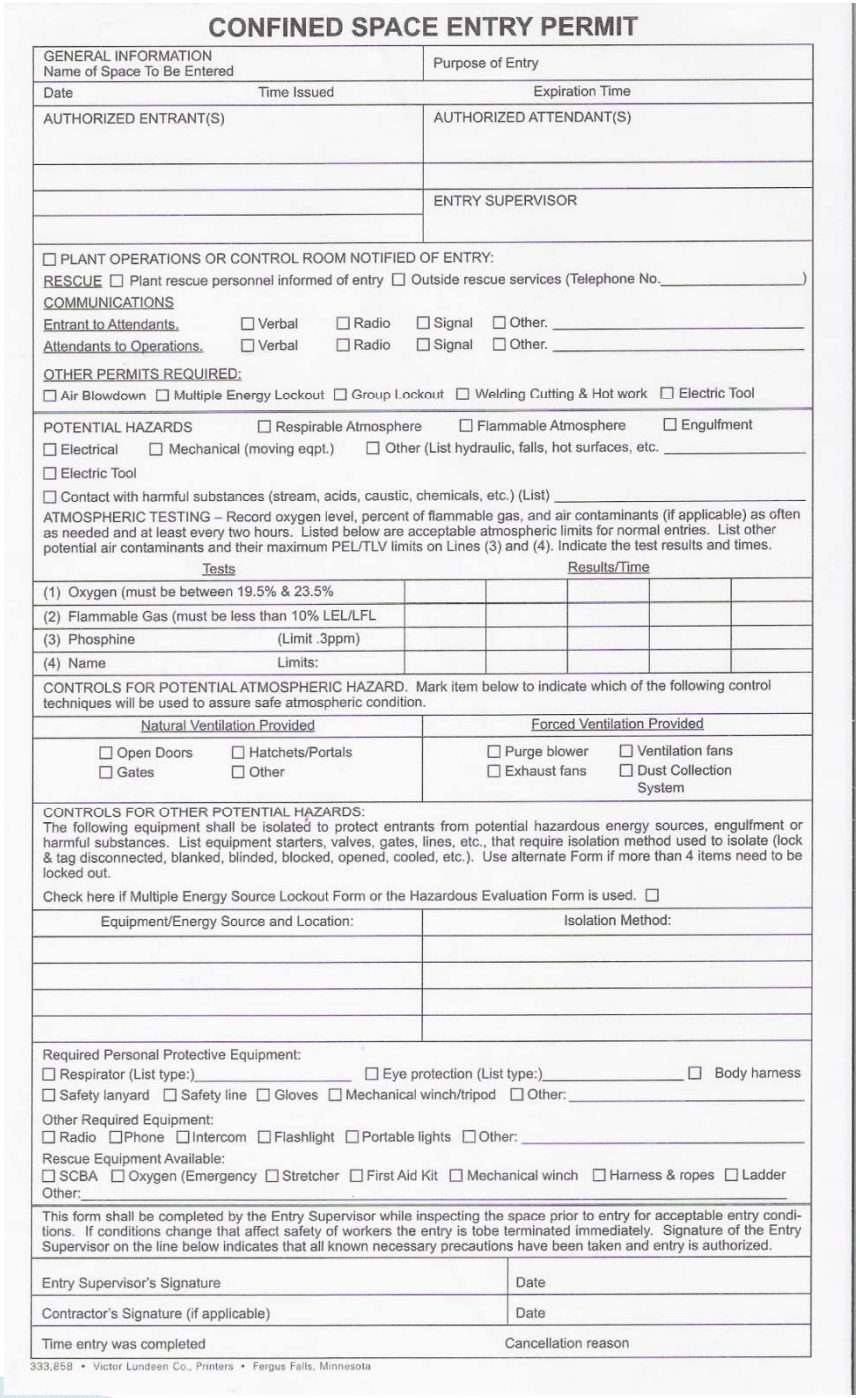
CSE Training Requirements

All trainers must sign off that employees have been trained.

- New employees must be fully trained before being a part of an entry procedure.
- Re-training experienced employees:
  - All affected employees must receive training annually.
  - Review any incidents that happen and apply new knowledge.
  - You may want to have workers take a written test for each role they may perform to demonstrate proficiency.



Confined Space Entry Permit



CONFINED SPACE ENTRY PERMIT

GENERAL INFORMATION Name of Space To Be Entered	Purpose of Entry
Date Time Issued	Expiration Time
AUTHORIZED ENTRANT(S)	AUTHORIZED ATTENDANT(S)
	ENTRY SUPERVISOR

☐ PLANT OPERATIONS OR CONTROL ROOM NOTIFIED OF ENTRY:

RESCUE ☐ Plant rescue personnel informed of entry ☐ Outside rescue services (Telephone No._____)

COMMUNICATIONS

Entrant to Attendants. ☐ Verbal ☐ Radio ☐ Signal ☐ Other. _____

Attendants to Operations. ☐ Verbal ☐ Radio ☐ Signal ☐ Other. _____

OTHER PERMITS REQUIRED:

☐ Air Blowdown ☐ Multiple Energy Lockout ☐ Group Lockout ☐ Welding Cutting & Hot work ☐ Electric Tool

POTENTIAL HAZARDS ☐ Respirable Atmosphere ☐ Flammable Atmosphere ☐ Engulfment

☐ Electrical ☐ Mechanical (moving eqpt.) ☐ Other (List hydraulic, falls, hot surfaces, etc. _____

☐ Electric Tool

☐ Contact with harmful substances (stream, acids, caustic, chemicals, etc.) (List) _____

ATMOSPHERIC TESTING – Record oxygen level, percent of flammable gas, and air contaminants (if applicable) as often as needed and at least every two hours. Listed below are acceptable atmospheric limits for normal entries. List other potential air contaminants and their maximum PEL/TLV limits on Lines (3) and (4). Indicate the test results and times.

Tests	Results/Time				
(1) Oxygen (must be between 19.5% & 23.5%					
(2) Flammable Gas (must be less than 10% LEL/LFL					
(3) Phosphine (Limit .3ppm)					
(4) Name Limits:					

CONTROLS FOR POTENTIAL ATMOSPHERIC HAZARD. Mark item below to indicate which of the following control techniques will be used to assure safe atmospheric condition.

Natural Ventilation Provided	Forced Ventilation Provided
☐ Open Doors ☐ Hatchets/Portals ☐ Gates ☐ Other	☐ Purge blower ☐ Ventilation fans ☐ Exhaust fans ☐ Dust Collection System

CONTROLS FOR OTHER POTENTIAL HAZARDS:
The following equipment shall be isolated to protect entrants from potential hazardous energy sources, engulfment or harmful substances. List equipment starters, valves, gates, lines, etc., that require isolation method used to isolate (lock & tag disconnected, blanked, blinded, blocked, opened, cooled, etc.). Use alternate Form if more than 4 items need to be locked out.

Check here if Multiple Energy Source Lockout Form or the Hazardous Evaluation Form is used. ☐

Equipment/Energy Source and Location:	Isolation Method:

Required Personal Protective Equipment:

☐ Respirator (List type:)_____ ☐ Eye protection (List type:)_____ ☐ Body harness

☐ Safety lanyard ☐ Safety line ☐ Gloves ☐ Mechanical winch/tripod ☐ Other: _____

Other Required Equipment:

☐ Radio ☐ Phone ☐ Intercom ☐ Flashlight ☐ Portable lights ☐ Other: _____

Rescue Equipment Available:

☐ SCBA ☐ Oxygen (Emergency ☐ Stretcher ☐ First Aid Kit ☐ Mechanical winch ☐ Harness & ropes ☐ Ladder

Other: _____

This form shall be completed by the Entry Supervisor while inspecting the space prior to entry for acceptable entry conditions. If conditions change that affect safety of workers the entry is tobe terminated immediately. Signature of the Entry Supervisor on the line below indicates that all known necessary precautions have been taken and entry is authorized.

Entry Supervisor's Signature	Date
Contractor's Signature (if applicable)	Date
Time entry was completed	Cancellation reason

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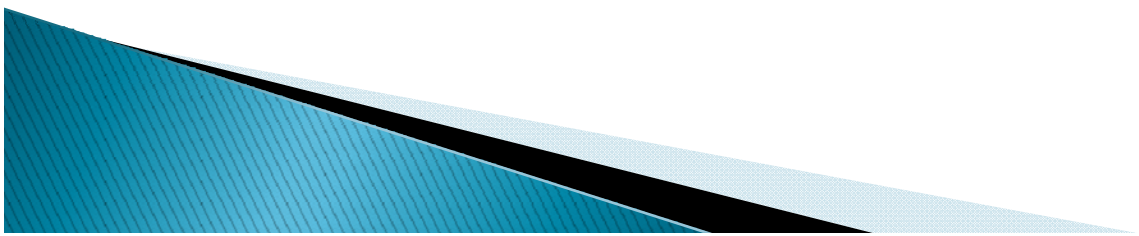
Entry Permit

- The entry permit needs to be completed and signed by the entry supervisor.
- It verifies that pre-entry precautions have been taken and the space is safe to enter.
- Specifies apparent hazards and corrective actions taken prior to entry.
- Requires termination of permit when task is completed or when conditions develop that the entry permit was not written for.



Entry Permit

- States the date, location, and name of confined space.
- Purpose of entry and known hazards.
- Duration of entry permit time.
- Authorized entrants, attendants, and supervisor are listed.
- Air testing results (initial and periodic)
  - O_2 and LEL at a minimum + other substances (toxics-such as Phosphine, Carbon Monoxide, H_2S) need to be checked if there if is a reason to believe they exist.

Entry Permit

- Name and phone number of rescue and emergency services.
- Communication procedures.
- Special equipment and protective measures to be taken
  - ventilation, lockout/tagout,
  - personal protective equipment and respirators
  - alarm procedures
  - rescue equipment
- Keep on site for one year (as per 1910.146).

U.S. Department of Labor
Occupational Safety and Health Administration

Inspection Number: 314096355
Inspection Dates: 11/08/2011 - 12/08/2011
Issuance Date: 05/02/2012

Citation and Notification of Penalty

Company Name:
Inspection Site:

Citation 2 Item 1 Type of Violation: Willful

29 CFR 1910.272(g)(1)(ii): Prior to entry, all mechanical, electrical, hydraulic, and pneumatic equipment which presented a danger to employees inside bins, silos, or tanks in the grain handling facility were not disconnected, locked out and tagged, blocked off, or prevented from operating by other means or methods:

a) On or about November 8, 2011, at the facility, the employer did not ensure employees were protected from bin entry hazards. The screw auger was not locked out or otherwise prevented from operating, which exposed the employee inside grain storage bins to amputation hazards.

ABATEMENT CERTIFICATION AND DOCUMENTATION ARE REQUIRED.

Date By Which Violation Must be Abated: 05/28/2012
Proposed Penalty: $ 38500.00

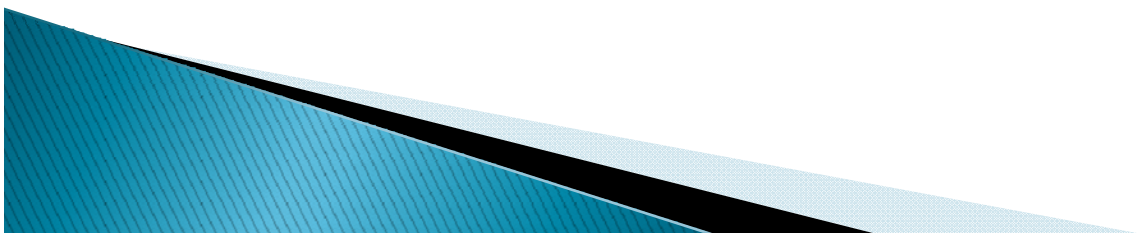
Confined Space Safe Work Plans

- Safe Work Plan
  1. Evaluate alternatives to eliminate entry.
  2. Specify acceptable entry conditions.
  3. Workers must be trained in the specific task procedure before entry.

     Examples include:
     - Bin shoveling procedures
     - Bin sweep operation and procedures
     - Bin cleaning
     - Probing and monitoring grain conditions
     - End-loader operation
     - Boatswain chair procedures
  3. Identify potential hazards and conditions that may develop during the entry.
  4. Provide pedestrian, vehicle or other barriers as necessary to protect entrants from external hazards.

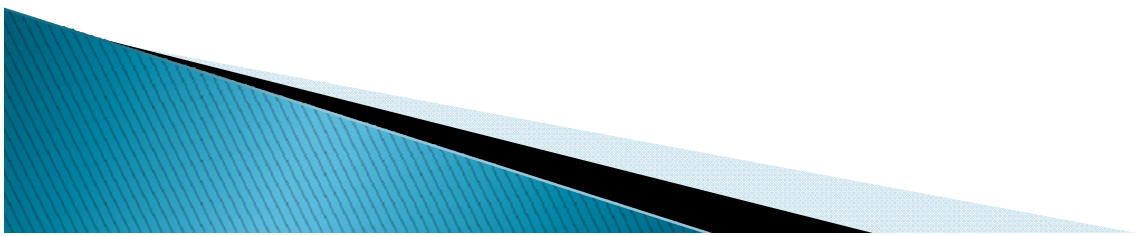
Confined Space Safe Work Plans

- Work requiring a body harness and life line:
  - If a potential engulfment hazard exists, **NEVER** stand or walk on any loose product where the depth is potentially greater than waist deep (recommend one foot deep), unless appropriate harness and lifeline is worn to preventing entrant from sinking further than waist deep.
  - To evaluate avalanching hazard, if you are at a distance that is at least at twice the height from the grain you will not become engulfed.
  - When lowering or raising a person on a boatswain chair, the lifeline must be attached to a mechanical device designed for human retrieval.



Contractor Confined Space Entry

- Contractors need to show proof of certification of training.
- Contractor must be informed that the workspace they will be entering is a permit-required confined space.
- Contractors must follow a confined space entry procedure program and complete a permit form that follows the guidelines as established through OSHA's permit required confined spaces guidelines (1910.146).



Open Flames / Hot Work

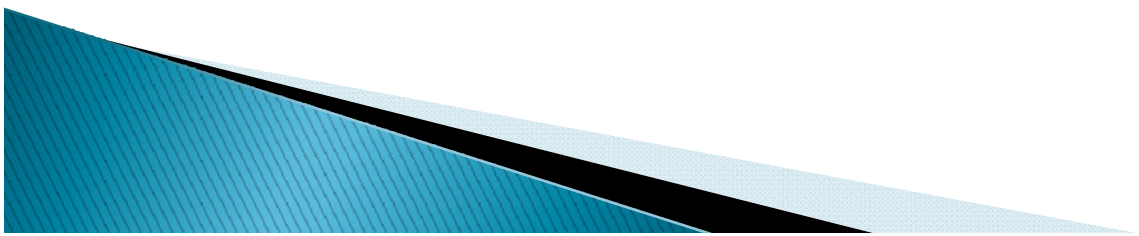
- Before performing hot work inside a confined space:
  - Test for combustible gases and vapors.
  - Continuously ventilate the space.
  - Arrange a fire watch with an ABC dry chemical portable fire extinguisher.
  - Do not allow tanks of welding of compressed gases inside the confined space.

Grain Bin Entry

- Covers entry into bins, silos, tanks and flat storage.
- Entry into any structure that requires the worker to enter from the top or high up on the side of a tank is covered by 272(g).
- Entry into flat storage at the bottom of the structure "through a ground level unrestricted entrance" where you are able to step or walk through the opening is a 272(h) entry.

Entry into Grain Storage

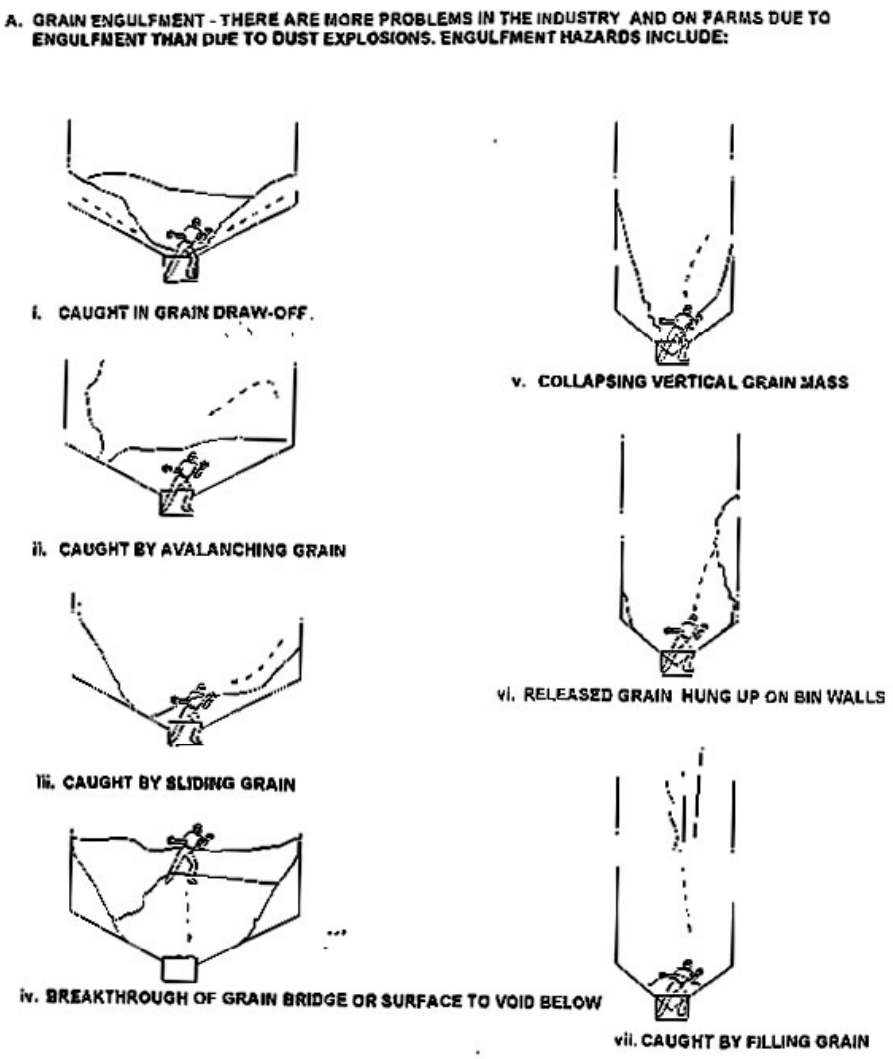
- Must issue a entry permit.
- Must evaluate atmospheric hazards.
- Ensure workers will not be exposed to mechanical hazards by locking-out all equipment.
- Check that no grain hazards exists such as grain hung on the sides, too steep of grain mass that can avalanche or bridging grain conditions.



Workers most often are engulfed when they go in to unplug the grain flow

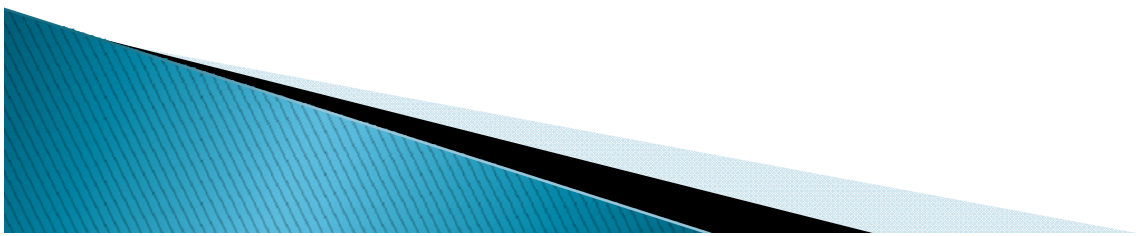
Typical Engulfment Hazards

Efforts are needed to improve the ability to clean out from outside the bin.



Entry into grain storage

- Ensure there are no engulfment hazards when workers are inside and on the grain. Turn off all reclaim conveyors and lock them out. Same with turnheads / distributors.
- NEVER walk down grain to make it flow as that is an unsafe practice and forbidden.
- Workers must wear a full body harness and lifeline when on the grain over waist deep and be secured so they can not sink into the grain further than waist deep.



In-Bin Restraint System
GSI Top Guard

WARNING: Entering grain storage bins is EXTREMELY DANGEROUS!

Always avoid entering a grain storage bin - if at all possible.

If you have to enter, you MUST follow these rules - they SAVE LIVES:

- ✓ **TURN OFF** and disconnect, lock out, or block-off all powered equipment, especially grain-moving equipment (like augers).
- ✓ **USE** a body harness with an anchored lifeline or boatswain chair when entering from a level at or above stored grain.
- ✓ **TEST** the bin's air to ensure there is enough oxygen and no toxic and/or flammable gas.
- ✓ **DO NOT** walk on or "down" the grain to make it flow.
- ✓ **DO NOT** enter onto or below bridged grain or when grain is built up on sides.
- ✓ **DO NOT** enter without having rescue equipment and a rescue-trained observer stationed outside who is in constant contact with you.
- ✓ **CONFIRM** from your employer's issued entry permit that all safety precautions are in place and it is safe to enter.

OSHA® Occupational Safety and Health Administration
www.osha.gov

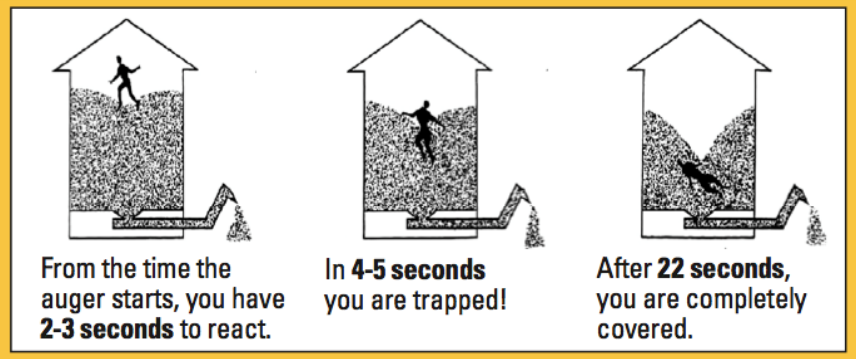
OSHA 3329-06-11N

WARNING:

Entering grain storage bins is EXTREMELY DANGEROUS!

Workers under 16 years old are prohibited from entering grain bins!

Moving grain acts like "quicksand" and can bury and suffocate you in seconds! **NEVER** stand on moving/flowing grain.

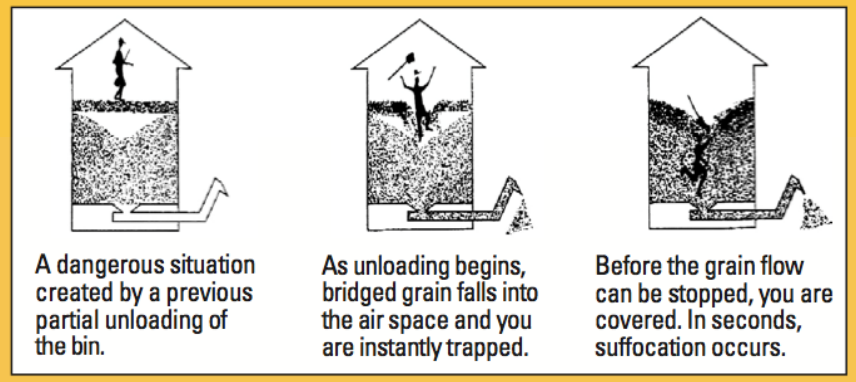


From the time the auger starts, you have **2-3 seconds** to react.

In **4-5 seconds** you are trapped!

After **22 seconds**, you are completely covered.

NEVER stand on or below bridged grain; **NEVER** stand next to grain accumulated on the side of bins or try to dislodge it.



A dangerous situation created by a previous partial unloading of the bin.

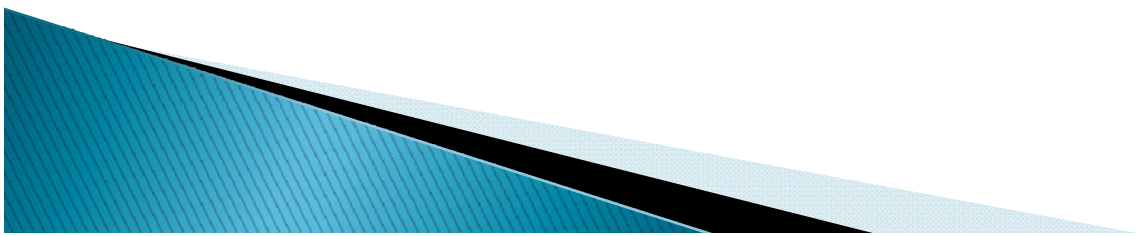
As unloading begins, bridged grain falls into the air space and you are instantly trapped.

Before the grain flow can be stopped, you are covered. In seconds, suffocation occurs.

For more information or to file a complaint, call the Occupational Safety and Health Administration (OSHA) at 1-800-321-OSHA (6742).

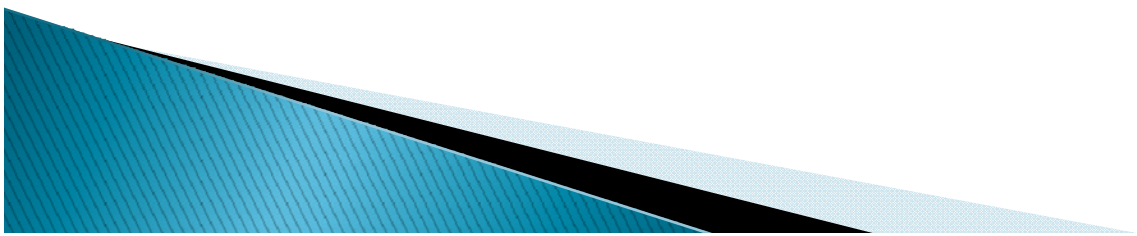
Entry into grain storage

- A standby observer must serve as an attendant to ensure proper practices are followed and help the entrants with monitoring conditions and keep the worker secured.
- Employees shall be trained in the hazards of engulfment and in avoiding mechanical hazards.
- Training is to be given annually.



Entry into grain storage

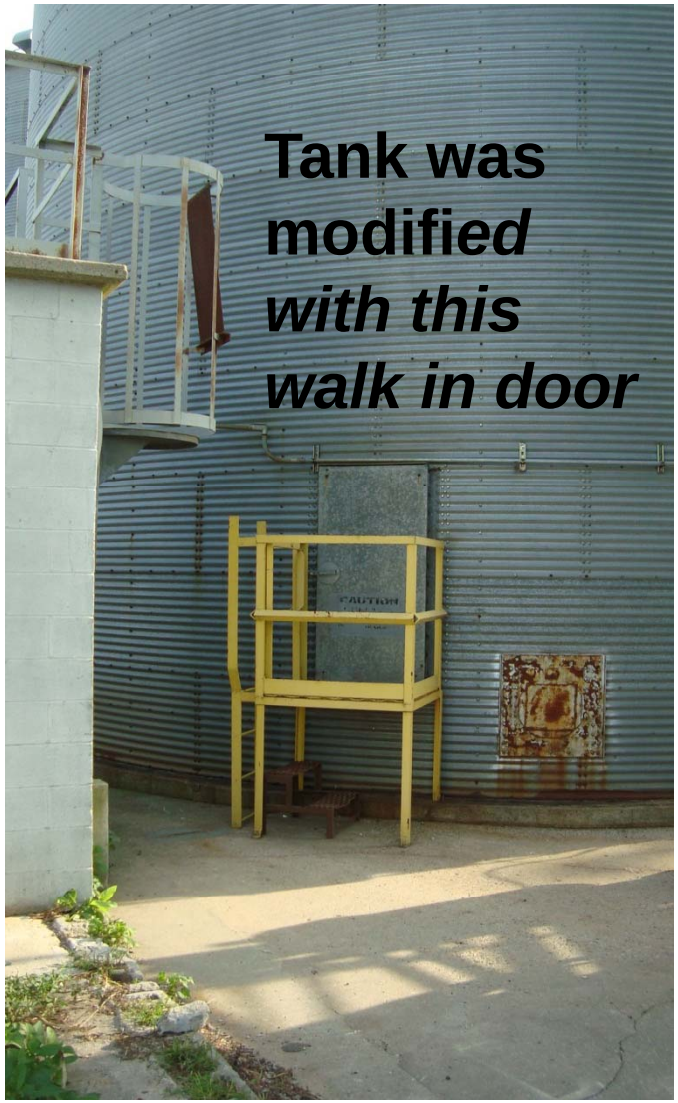
- If you are entering a bin of any type above the grain follow 272(g). If you are entering the bottom of a bin through unrestricted ground level opening and there is no atmospheric concerns follow 272(h).
- You can turn aeration on or use forced air fans to ensure there is no question about the atmosphere issue.



Entry into grain storage

Ground level & unrestricted

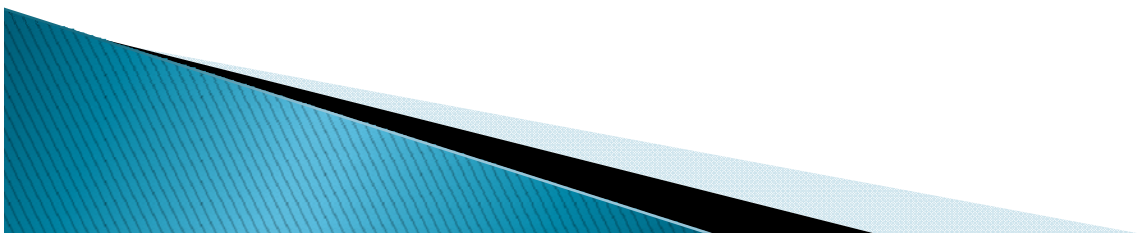
This type of 2 ring door (5’) is available for most new tanks



Tank was modifi*ed with this walk in door*

Evacuation

- The entrant immediately evacuates the space when:
  - An IDLH (Immediately Dangerous to Life and Health) situation develops.
  - Safety equipment fails.
  - The entrant is using unsafe work practices within the confined space.
  - The work being done is creating a hazardous atmosphere.
  - A hazard is detected during monitoring.



Self-Rescue

- The entrant exits the space immediately when:
  - He detects signs or symptoms of exposure to hazards associated with the confined space.
  - The attendant detects a hazardous condition.
- If a rescue is needed, the attendant will:
  - Summon emergency responders.
  - Attempt to rescue entrant using only non-entry rescue equipment.

The attendant must never enter the confined space for rescue, unless trained for rescue, equipped, and relieved.

Non-Entry Rescue

Vertical Entry

If > 5’ deep, must provide a mechanical device that provides for retrieval.

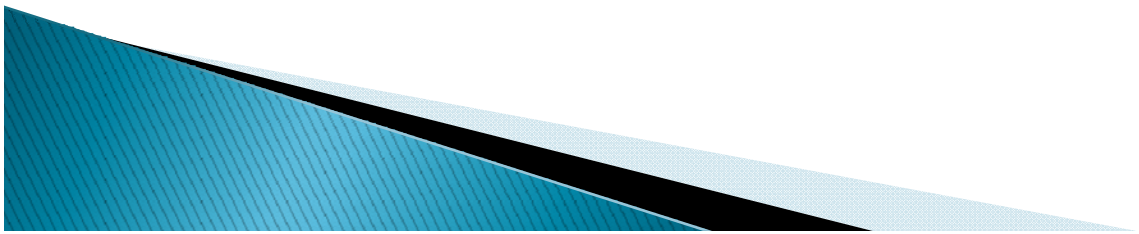
Rescue & Emergency Services

- Who is your rescue team?
  - Have you evaluated them? 1910.146 App. F
  - Do THEY know they are your rescue team?
  - Notify your rescue team prior to every entry. (phone call? e-mail? other?)

Rescue & Emergency Services

- What are your options?
  - Local Fire Department
  - Contracted Rescue Team
  - Internal Rescue Team
  - Combination Response

- If an Employee-based Rescue Team is the only choice, the company must be prepared to dedicate the time and funding needed to properly establish and train the team.



GREAT FALLS FIRE RESCUE

105 9th Street South
Great Falls, MT 59401

Phone: 406-727-8070
Fax: 406-454-2454

8/10/2009

Columbia Grain CGI
Attn James Beardsley
1820 12th Ave N
Great Falls, MT 59401

Dear Sir or Madame:

This letter is formal notification to all organizations, businesses and contractors, that Great Falls Fire Rescue (GFFR) will no longer provide confined space rescue operations for permitted confined space entries according to Occupational Safety and Health Administration's (OSHA) 29 CFR 1910.146 (d) (9) & (k) which states:

19110.146(d) (9)

"Develop and implement procedures for summoning rescue and emergency services, of rescuing entrants from permit spaces, for providing necessary emergency services to rescued employees and for preventing unauthorized personnel from attempting a rescue."

1910.146(k)

Title "Rescue and Emergency Services" "An employer who designates rescue and emergency services, pursuant to paragraph (d)(9); select a rescue team from those evaluated that has the capability to reach the victim(s) within a time frame that is appropriate for the permit space..."

Those organizations with permitted entries and who have written into their confined space plan as required and defined in 1910.146 will no longer name Great Falls Fire Rescue in that plan as the rescue team as required by 1910.146 (k). The organization with "permitted entries" will have to contract with an organization to provide a rescue team or will have to train their staff to conduct rescue operations.

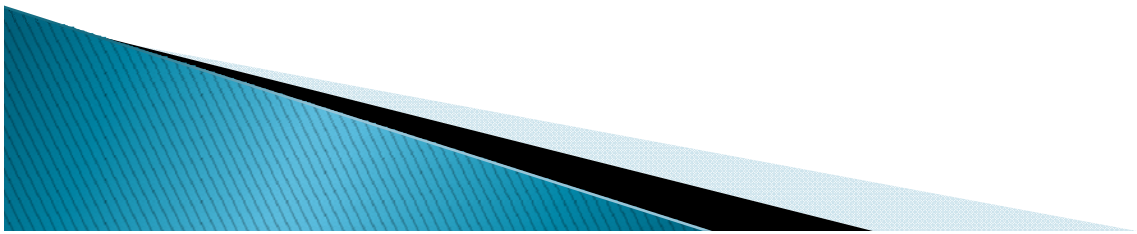
Great Falls Fire Rescue will continue to respond to emergency 911 calls but the department will no longer be trained or equipped to monitor, or enter an Immediately Dangerous to Life and Health (IDLH) atmosphere in a confined space as defined by OSHA.

Sincerely

Randall E. McCamley
Fire Chief
Great Falls Fire Rescue

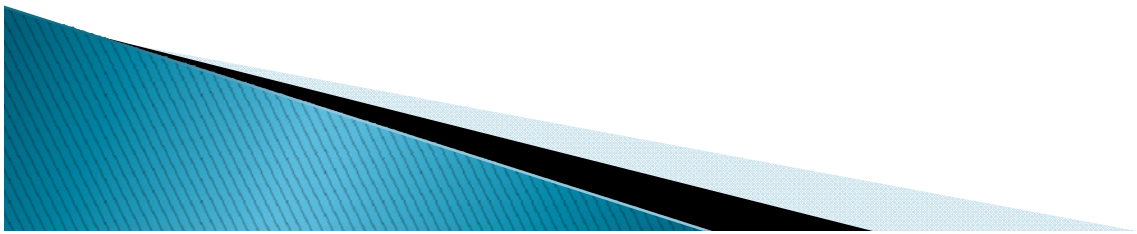
Internal Rescue Team

- What does OSHA require for rescue team training?
  - Standard is “performance based”.
  - Does not specify how many hours of training is required.
  - PPE; Entry Rescue Equipment; First-Aid and CPR trained.
  - Must practice rescues at least once every 12 months from “representative” spaces.



Typical 40 Hour Rescue Training Course

- All topics covered in the Confined Space Entry course plus:
  - Equipment basics
  - Pre-emergency Planning
  - Rescue team organization/operation
  - Basic rigging and knots
  - Building rescue systems for hauling/lowering
  - Patient packaging
  - Positive and Negative pressure ventilation
  - Donning and doffing SCBAs and SARs



External Rescue Team

- Make them aware of hazards specific to your mill.
- Offer access to spaces for training.
- Possibly offer buying rescue or safety equipment that they are in need of.
- Review 1910.146 Appendix F regarding Rescue Team or Rescue Service Evaluation Criteria.

Combination Rescue Response

- Many times, this is the likely choice for grain elevators and feed mills.
  - If local Fire Department can not arrive on-site quickly enough.
  - Employees provide *Non-Entry Rescue* and immediately contact rescue team.
- Example: City of Portland
  - Make pre-entry notification call.
  - Department is NOT available as Immediate Rescue Source (thus our Non-Entry Rescue plan is critical).
  - In case of emergency, specifically request Confined Space rescue team via 911.