Identifying Confined Space

By

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Knowledgeable Customer Service

Overview

- Confined Space Entry
- Permit Required
- Grain Bin Entry
- Hazards
- Examples
- Summary

Grain Industry

- 1910.146 Confined Space
- “Special Hazard Industry”
- 1910.272 Grain Storage

OSHA 1910.146

CONFINED SPACE ENTRY

Must meet all three

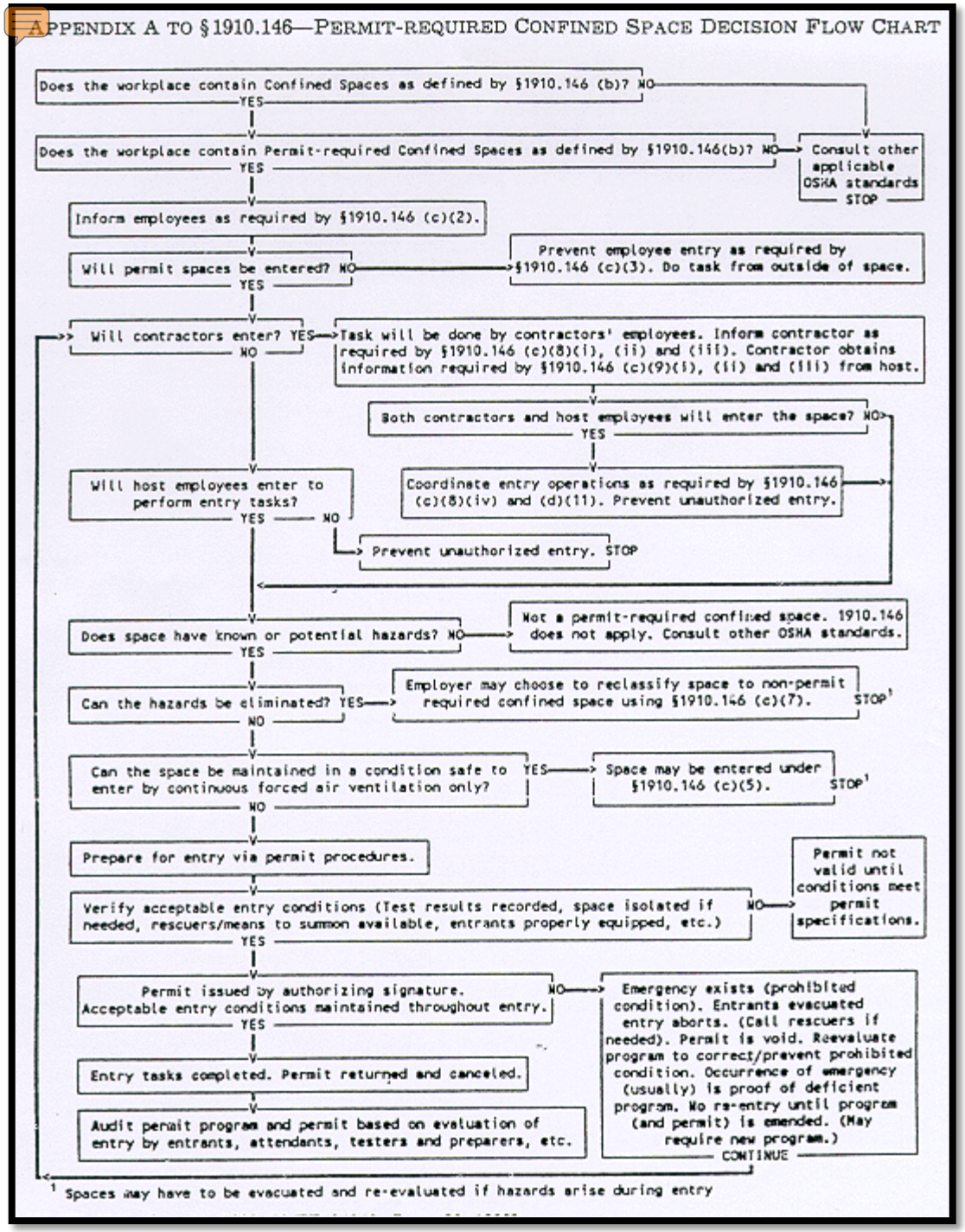
- Large enough to enter and perform work
- Limited entry or exit
- Not designed for continuous occupancy

OSHA 1910.146

PERMIT REQUIRED (PRCS) – potential for:

Only needs ONE of the following:

- Atmosphere hazard
- Engulfment hazard
- Internal design which could trap or suffocate entrant
- Any other recognized hazard
  - (electrical and mechanical included)



OSHA 1910.146 Appendix A

Permit-Required Confined Space Decision Flow Chart

OSHA 1910.272 (g) & (h)

GRAIN HANDLING FACILITIES

- Raw or Processed Grain & Grain Products
  - Bin, Silo, Tank and other grain STORAGE structures

- **Exception**: Unrestricted ground level opening w/o atmospheric hazard

OSHA 1910.272 (g), (h)

- Does NOT address:
  - Basements
  - Boot Pits
  - Receiving Pits
  - Tunnels

OSHA New Hazard Alert

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.

Hazards Overview

- Atmosphere
- Chemical Exposures
- Electrical
- Engulfment
- Falls
- Mechanical Hazards
- Psychological
- Temperature

Oxygen

Safe Range – 19.5% to 23.5%

- 23.5% + Extreme Fire Hazard
- 15 – 19% = Impairs coordination
- 12 – 14% = Difficult breathing
- 8 – 10% = Mental failure
- 6 – 8% = Death w/in 8 minutes
- 4 – 6% = Coma w/in 40 seconds

Other Atmosphere

- Phosphine (Ph3)
  - Acceptable Range =< 0.3ppm
- Hydrogen Sulfide (H2S)
  - Acceptable Range =< 10ppm
- Carbon Dioxide (CO2)
  - Acceptable Range =< 5000 ppm
- Carbon Monoxide (CO)
  - Acceptable Range =< 35 ppm

Flammable Atmosphere

- a.k.a Combustible Gas and LEL
- Acceptable Range =< 10% LEL
- Propane
- Acetylene

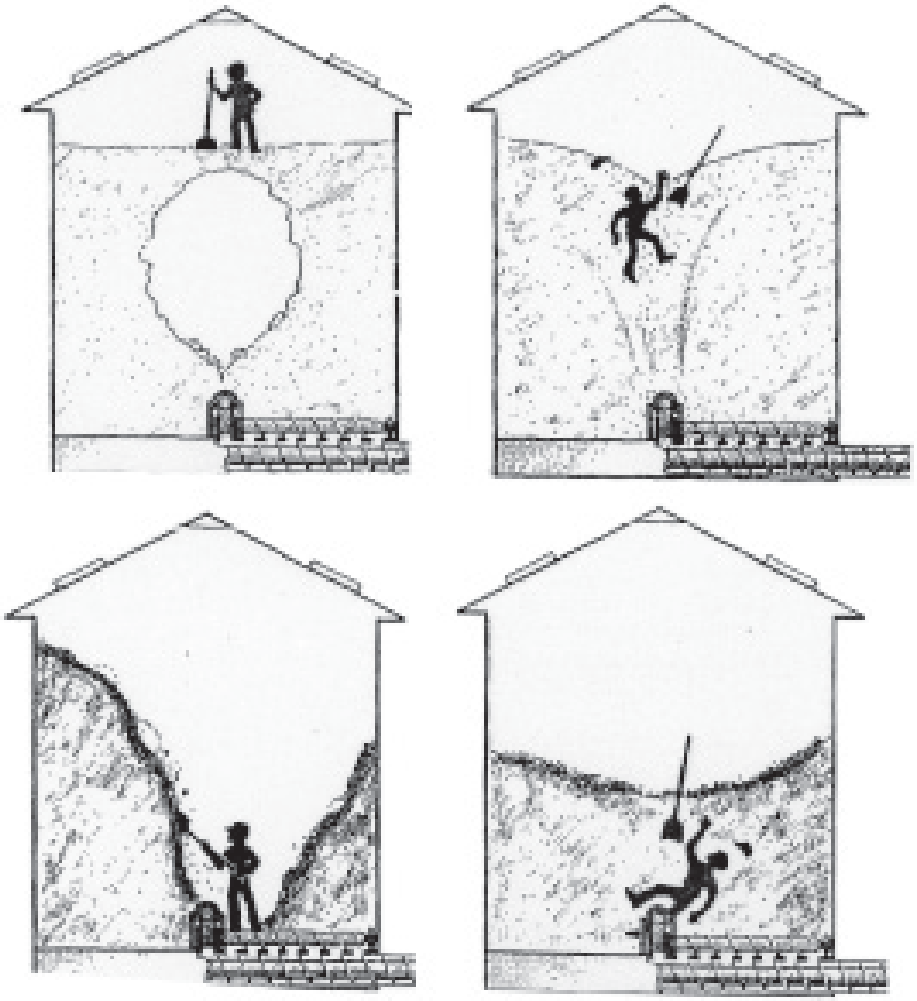
- **DOES NOT REFER to grain dust**

Atmosphere More

- Respirators filter 95-99% of particles
- Otherwise lungs collect
- Fungus
  - Allergic reaction
- Dust
  - Can accumulate and harden lung tissue
  - Encourages growth of bronchitis

Engulfment

- Bridging
- Avalanche
- Unloading (walking on grain)

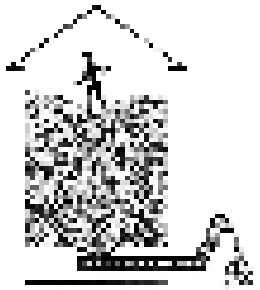


WARNING:

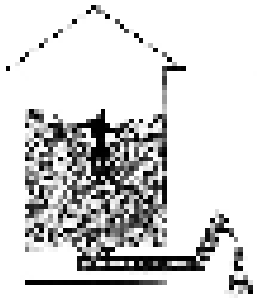
Entering grain storage bins is EXTREMELY DANGEROUS!

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.



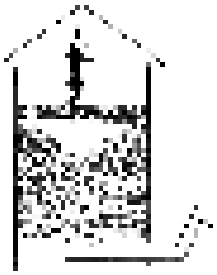
From the time the auger starts, you have 2-3 seconds to react.



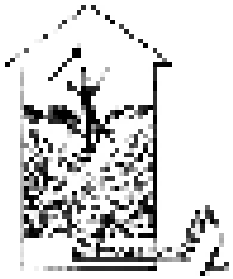
In 4-5 seconds you are trapped!

After 22 seconds, you are completely covered.

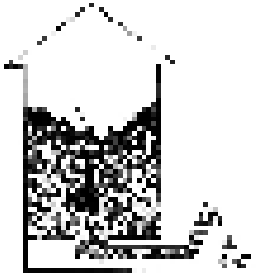
NEVER stand on or below bridged grain; **NEVER** stand next to grain accumulated on the side of bins or try to dislodge it.



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

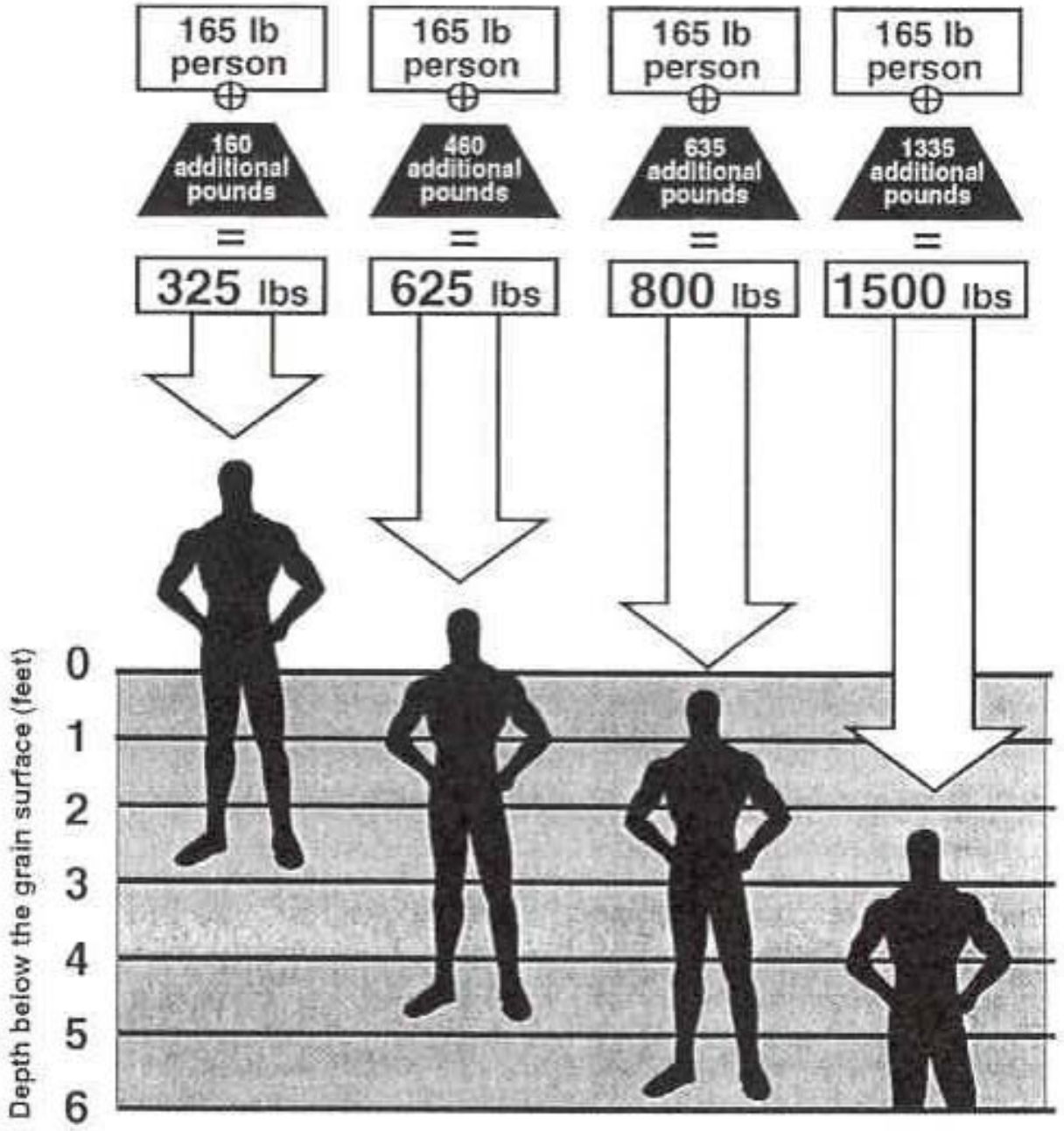


As unloading begins, bridged grain falls into the air space and you are instantly trapped.



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



Force to Rescue Engulfed Victim

- 30 – 50 lbs to manipulate spine
- Not all of the force is focused on specific area – but increases to a smaller area the deeper you are buried.

Psychological Hazards

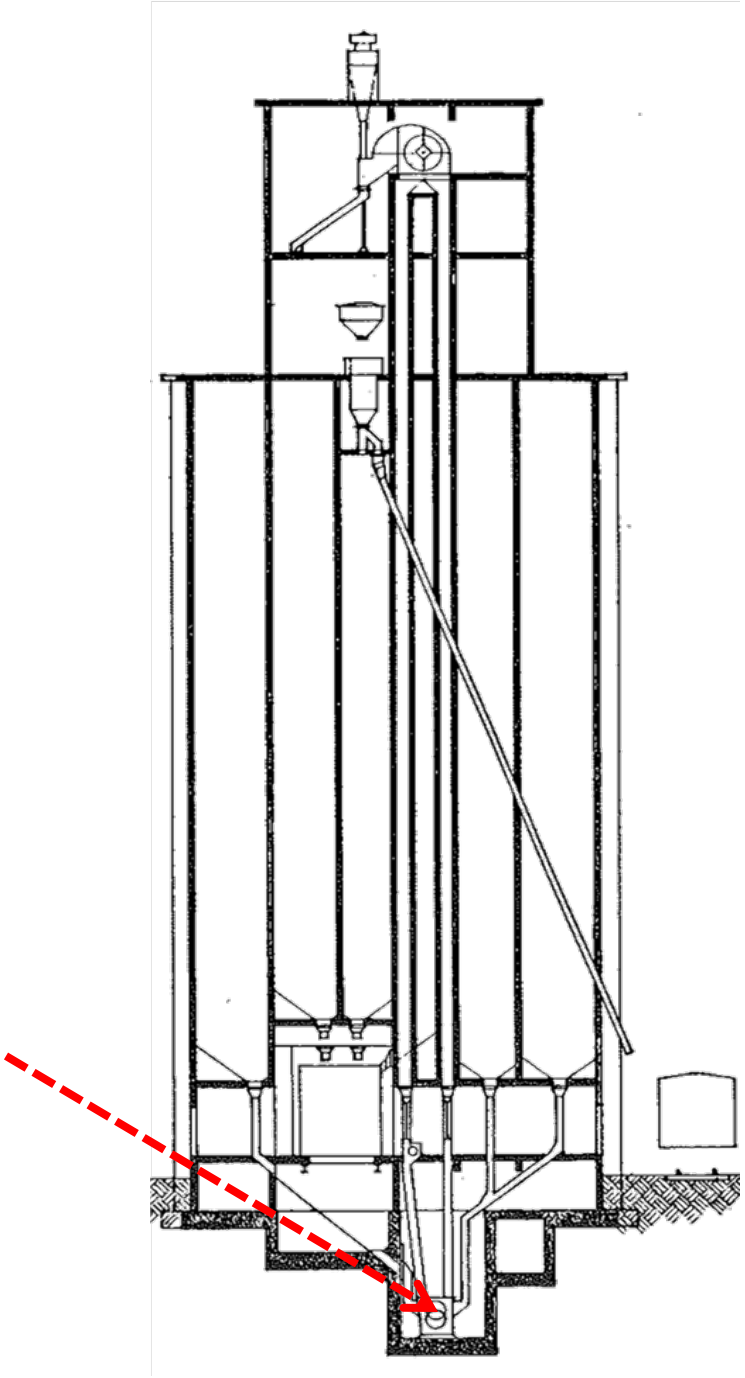
- Claustrophobia
  - Dark, cramped space
  - Reluctant
  - Increased heart rate
  - Increased breathing rate
- Poor physical condition
  - Easily Fatigued
  - Increased panic
  - Increase fear of doing tasks

Examples

- **1st Set of Questions – All Three Yes?**
  - Size – can you bodily enter?
  - Entrance / Exit restricted?
  - Continuous occupancy?
- **2nd Set of Questions – Any One Yes?**
  - Atmosphere Hazard
  - Engulfment Hazard
  - Internal design hazard
  - Other Recognized Hazard

Ammonia Tanks

Boot Pits



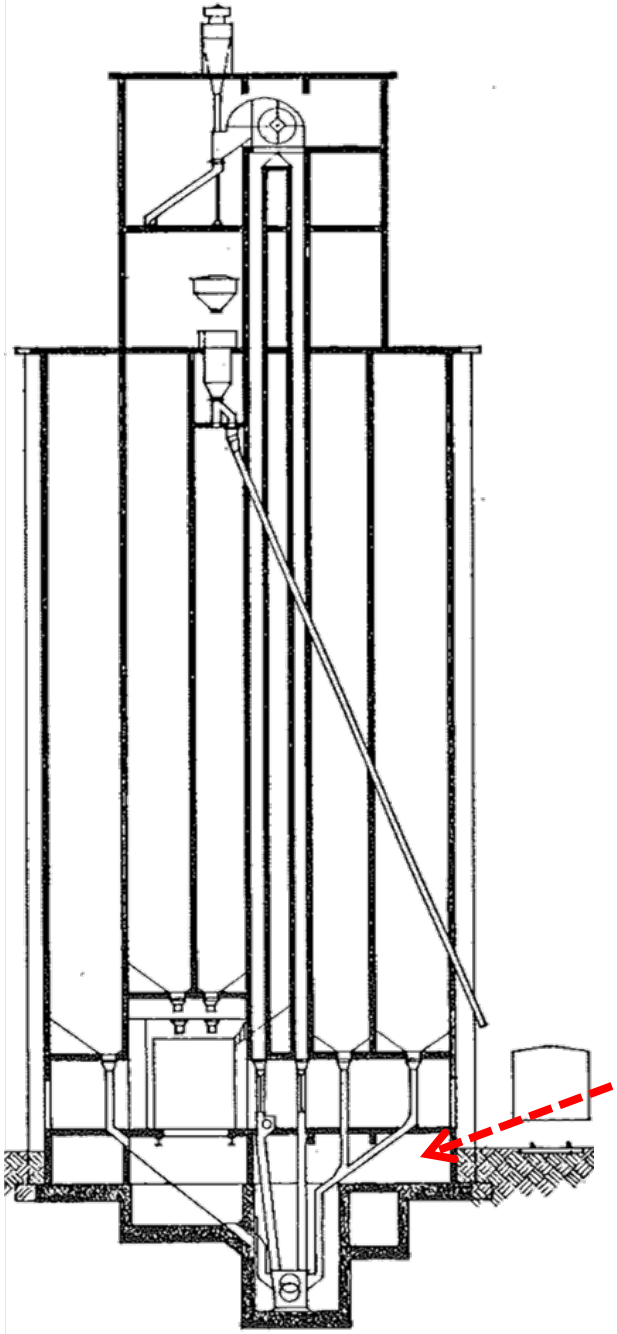
Boot Pits

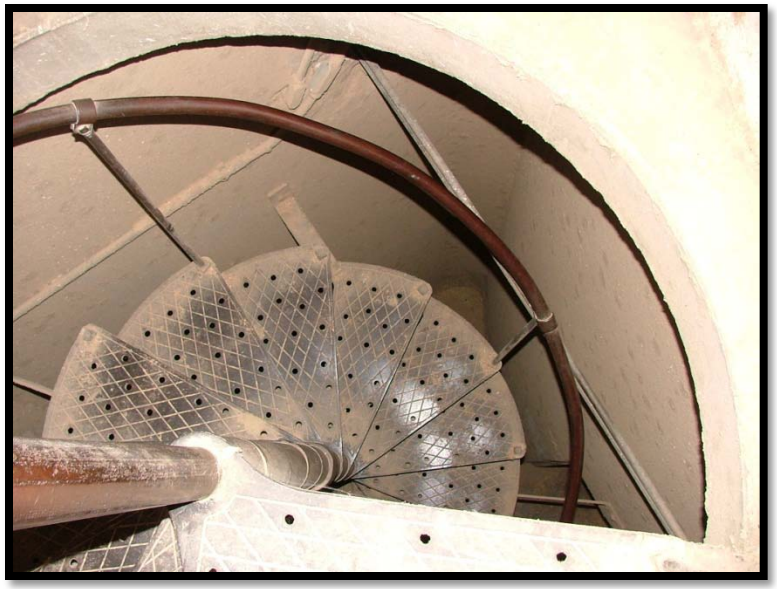
Boot Pits

Fertilizer Storage

Flat Storage

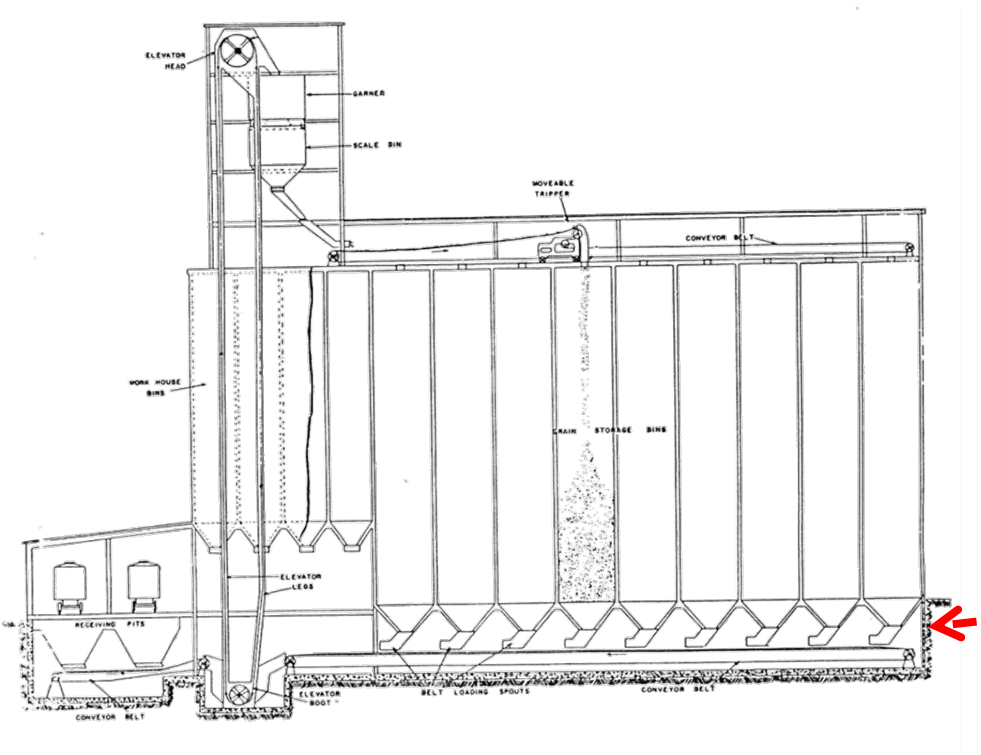
Basements





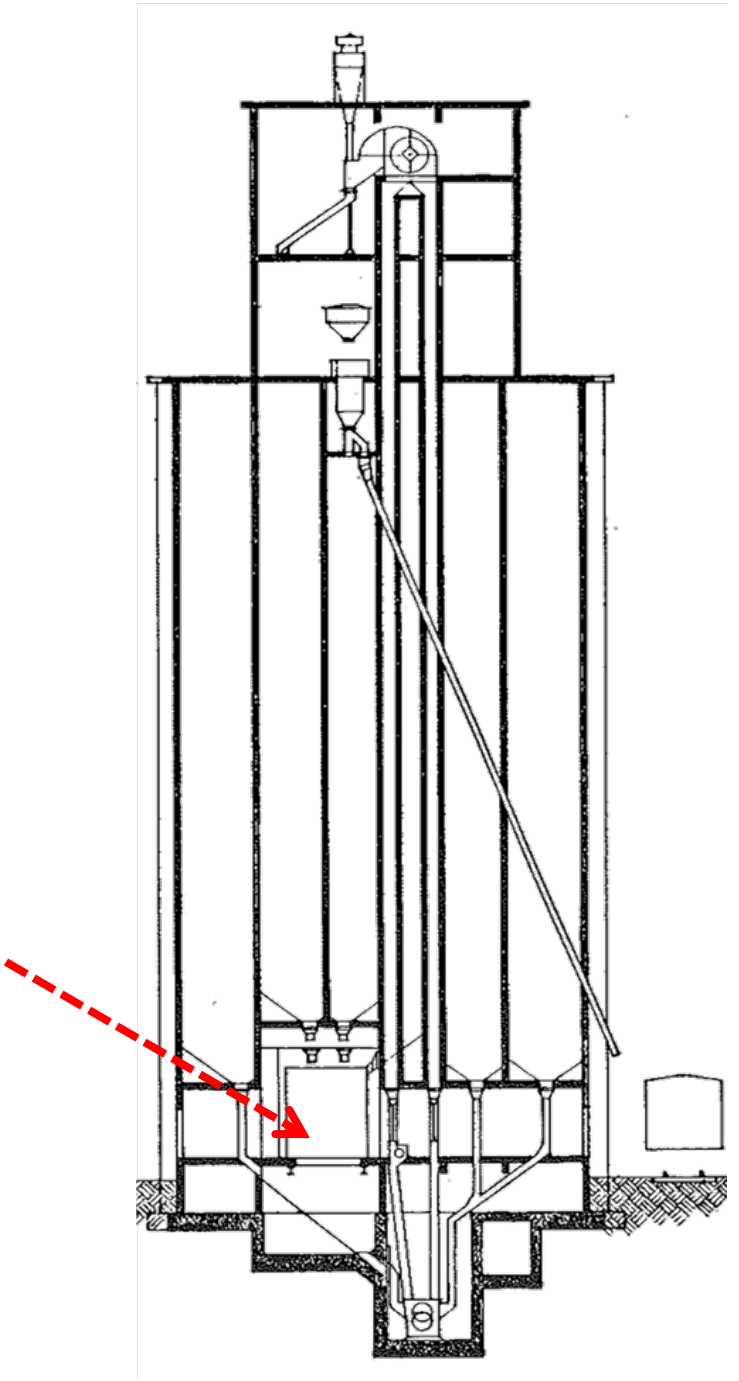
Tanks

Tunnels


ELEVATOR HEAD
GARNER
SCALE BIN
MOVEABLE TRIPPER
CONVEYOR BELT
WORK HOUSE BINS
GRAIN STORAGE BINS
ELEVATOR LEGS
RECEIVING PITS
CONVEYOR BELT
ELEVATOR BOOT
BELT LOADING SPOUTS
CONVEYOR BELT

Tunnels

Receiving Pits



Scale Pits

Steel Bins

Storage Bins – Internal Hazards

Entering Procedures

- PRCS & Grain Bin Entry Similar
  - Review general requirements
    - OSHA isn’t main concern
      - Better safe than sorry

GOAL - SAFETY

Similarity / Difference

- Both require permits
- Both require LOTO
- Both require hazards being eliminated
- Difference:
  - Bin Entry:
    - Structures designed to store grain only
    - Check for oxygen if not properly vented
    - Check for known gases (includes combustible)

Permits

- Checklist
- Evaluates hazards
- Verification hazards are eliminated
- Keep as documentation

Pilots use them too!

Entering Parameters

- Conduct Hazard Evaluations
- Written Program
- Attendant
- Authorized Entrant
- Entry Supervisor
- Rescue Equipment
- Trained Rescue Personnel

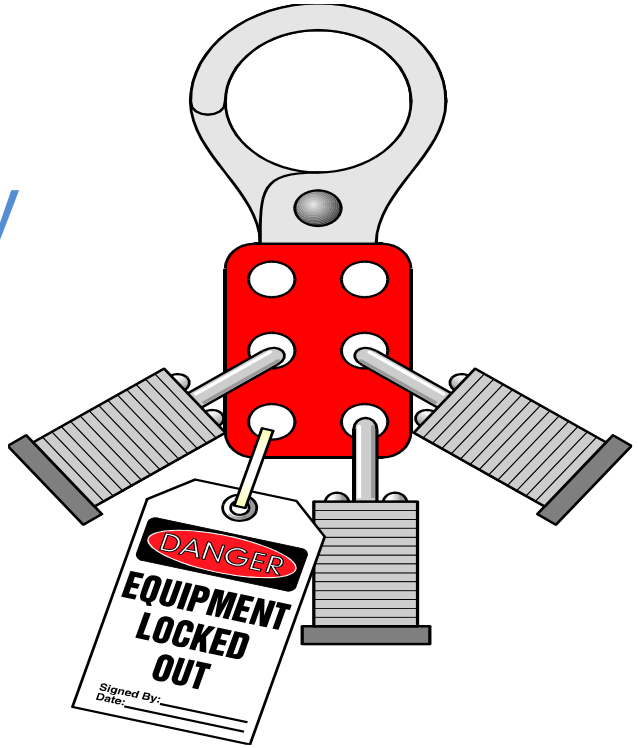
EVERYONE TRAINED

Entering Parameters

- Inspect ALL Equipment
- Isolate Space - LOTO
- Ventilate (if applicable)
- Calibrate Gas Monitors
- Test Atmosphere
- Complete Permit

Lock Out / Tag Out LOTO:

- Block ALL energy sources
- Release ALL stored energy
- RE-TEST power source
- One tag and lock / worker



Short Cuts

- There aren't any!

Only excuses

– "It was late"

– "Only take a few minutes"

– "I've done it before"

– "Not worth the extra effort"

Effects of Fatality

- Company Employees
- Supervisor
- Management
- Company
- Company's reputation
- Community

Summary

- **Types of space being entered**
  - – Bins, Hopper, Tanks, etc
  - – Permit, Non-permit, Grain Storage
- **Types of entry points**
  - – Side, Top, Restricted
- **Hazards**
  - – Atmosphere, Electrical, Engulfment, Equipment, Psychological, Temperature

Summary

- Properly mark all entry points
  - Is NOT “One size fits All”!
- Even within same facility, two boot pits may be classified differently.
  - Permit = Friend = CYA
  - TRAINING

Summary

- Atmosphere Testing
- Communications
- Proper equipment for Entry
- LOTO
- Permits – Process
- Rescue – who & trained?

Thank You!

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