Grain Industry -- Insurance Risk Control Observations

Al Tweeten, CPCU, ARM, ALCM
Risk Control
Grain elevator accident in Newdale results in fatality


JOSEPH LAW jlaw@uvsj.com | 0 comments

Updated with victim’s name.

NEWDALE - Despite intensive rescue efforts, a man who became trapped in a grain elevator in Newdale early Tuesday evening was found dead.

The victim has been identified as Julio Luis Garcia, 47, of Idaho Falls.

The accident occurred at the General Mills Elevators on the west side of Newdale.

A news release from Fremont County Search and Rescue states that Garcia, who was an employee at the elevators, became trapped and partially buried in a silo containing barley while unclogging the bin. The silo was being unloaded at the time. His partner, unable to recover him, called 911.
Survivor of Mount Carroll grain bin accident in fair condition

THE ASSOCIATED PRESS
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MOUNT CARROLL – The survivor of a grain bin accident that left two teenagers dead Wednesday is in fair condition this morning at OSF Saint Anthony Medical Center.

William Piper, 20, of Mount Carroll, was working inside the bin with 19-year-old Alejandro Pacas and 14-year-old Wyatt Whitebread at about 10 a.m. when the incident happened.

The three became trapped in the bin, and Pacas and Whitebread were pronounced dead after being pulled from the bin after 10 p.m. Wednesday.

THURSDAY COVERAGE
OSHA: Mount Carroll grain bin deaths were preventable

MOUNT CARROLL – The survivor of a grain bin accident that left two teenagers dead Wednesday is in fair condition this morning at OSF St. Anthony Medical Center.

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MOUNT CARROLL – A grain bin accident that left two teenagers dead and a third hospitalized could have been prevented and preliminary investigations found one worker was underage and employees lacked safety equipment, a federal Occupational Safety and Health
Risk Control Observations

- Safety Program
- Accountability
- Grain Bin Deferred Maintenance
- Grain Bin Structural Case Study
- Housekeeping
- Grain Handling Safeguards
Observations

• There is no “one size fits all” approach to safety.
• Must have senior management’s support and involvement.
• Every organization has it’s own unique personality.
  – Must find approach that works best for your organization.
  – If what you are doing now isn’t working, try something different.
  – Even if it is working, add to it. Continuous improvement.
Observations

• TRAINING, TRAINING, and more TRAINING
  – Classroom
  – On-the-job
  – Payroll stuffers
  – Newsletters
  – Safety committee
  – Train-the-trainer
  – Daily reminders (tailgate or toolbox talks)
YOUR SAFETY MATTERS - DVD SUPPLEMENTAL MATERIAL

TABLE OF CONTENTS

Fire and Explosion
- Bearing Lubrication Program
- Checklist- Bucket Elevator Inspection Checklist
- Checklist- Dust Systems Inspection Checklist
- Checklist- Feed Mill Preventative Maintenance
- Checklist- Grain Elevator Preventative Maintenance
- Data Sheet- Planning Maintenance Work
- Elevator Leg Choke Procedures
- Hot Work Permit
- Hot Work Procedures
- Sample Housekeeping Program

Confined Space Entry
- Data Sheet- Bottom Entry Into Confined Spaces
- Data Sheet- Hints for Suspecting Atmospheric Problems
- Data Sheet- Self-Contained Breathing Apparatus (SCBA)
- Data Sheet- Side Entry Into Confined Spaces
- Data Sheet- Ventilation Alternatives
“Leadership is the art of getting someone else to do something you want done because he (or she) wants to do it.”

Dwight D. Eisenhower
• Is your message delivered properly and received properly?
  – Is senior management committed to your safety program?
  – Is your management team “drinking the Kool-Aid”?
  – Is your management team empowered to enforce your policies?
Observations

• Safety training must be a priority.
  – Training never has the day off.
  – Everybody’s responsibility.
  – Proper training tools/proper delivery.
  – Appropriate reward for following the rules.
  – Appropriate discipline for breaking the rules.
Accountability

• Are safety expectations defined in job descriptions?
• Are there safety incentives built into performance reviews or bonus program?
• Are there department or location charge backs for costs of accidents and insurance?
Accountability

• Incentive Example
  – Location manager has all required training documentation for all employees under his control.
    • Receives $500 incentive bonus.
  – Additionally, he or his grain superintendent have completed daily 5-minute toolbox talks with documented employee signatures at the beginning of each day (or change in job assignment/conditions).
    • Receives an additional $500 incentive bonus.
Accountability

• Zero tolerance for violation of engulfment prevention program.
  – 20-year employee operating an end loader in a large grain flat moving grain to an auger floor sump.
  – Clump of grain plugged sump.
  – Employee used rod to break up clump w/o following procedures.
  – Buried chest deep.
  – Luckily able to call for help.
  – Rescued with no injury.
  – Was terminated two weeks after incident.
Accountability

• Are there conditions at your facilities that could be improved to reduce the risk of engulfment?
  – Reclaim systems that plug?
  – Bottle necks?
  – Outdated equipment?
  – Preventive Maintenance?
  – Housekeeping?
Accountability
Accountability
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Accountability
Accountability
Accountability

• Fix the condition.

• More importantly, fix what allowed the condition to happen.
Grain Bin Observations

• Quote from prospective customer:
  “Depreciation isn’t just a number on our financial statement. Depreciation is real. We replace and update our property as needed.”
Grain Bin Observations
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Grain Bin Observations

• Case Study Example
• 2 - 450,000 bu bins
Heavy Bin Stiffener Anchor

(1) All bins will have ALL 2 ring bottom stiffeners. Stiffened bins may have two or three Stiffeners per sidewall sheet depending upon bin size and height.

(2) Bolt anchor brackets to 2-ring bottom stiffeners. DO NOT fully tighten, only finger tighten at this time.

(3) After the bottom ring is attached, lower the bin carefully, placing all anchor brackets over the anchor bolts.

(4) When full weight of the bin is on the concrete, shim the anchors as necessary by sliding shim plates between the concrete and anchor bracket. All anchors must be bearing upon the concrete or shimmed so that full bearing of the anchor is developed.

**NOTE:** Anchors placed over aeration trenches must be supported from the bottom of the trench.

After all anchors brackets are shimmed snugly, place two square washers over the anchor bolts and tighten.

Plastic cement or tar sealant should be applied from inside the bin to seal the bottom ring to concrete. **(NOTE: Sealant is not furnished by Chief Industries, INC.)**
Bin Stiffener anchors allow up to 3 anchor bolts to be used at each anchor location. There are (2) 1” diameter and (1) 1-1/2” diameter holes in each Bin Stiffener Anchor.

There are several different combinations that Chief Industries Recommends to anchor the bin to the foundation.

1. One 1-1/4” x 12” anchor bolt may be used in the 1-1/2” diameter hole, if this is done the anchor bolt must be pre set in the concrete

2. Two 3/4” x 12” anchor bolts may be used in the two 1” diameter holes. If this is done, at least one of the two anchor bolts must be pre set in the concrete the second may be drilled in. (It is recommended that both anchor bolts are pre-set.)

If anchor bolts are not pre set as stated above, and the anchor bolt radius is not held, the bins warranty may be nullified.

Larger anchor bolts or the use of all three anchor bolts may be required if seismic conditions or high wind loads exist. Chief Industries should be consulted for proper anchor bolts to be used.

All anchor bolts must project a minimum of 2” above the concrete floor.

All anchor bolts, nuts and washers shall conform to ASTM A307 (specification for carbon steel threaded standard fasteners) unless otherwise noted. Anchor bolts, nuts and washers are not provided by Chief Industries, Inc.

**IMPORTANT:** If expansion type anchor bolts are used to replace damaged anchor bolts, the bolt radius circle must be checked at replacement locations so that the bin is round when anchored. Chief Industries recommends using wedge anchors that meet 10,000 LB Pull-Out and 7,500 LB shear criteria.
• From Nohr Engineering’s website
  – Plugged center gate
  – Plugged intermediate gate
  – Opened floor gate next to the wall
  – Bin recorrogated into the excentric due to the flow channel against the wall
  – Operators panicked and opened all the gates to try to empty as quickly as possible
• Read the operators manual
• Unload completely or only draw from center gate to keep loading on side wall even.
• Side draw use (only if approved and engineered by the manufacturer and if equipped with “flue”)
• Bins have break in procedure
  – Example: fill in ¼ increments and in-between let the bin settle for 2-days before adding more grain.
• This customer utilizes small padlocks on all but center gate.
• Only the location manager can open intermediate and side gates.
Changes Must be Professionally Engineered
Housekeeping Comparison

• Two nearly identical grain elevators
  – Each built at the same time, with same capacity, similar equipment and similar capacity annexes.
  – Each feeds 3000 bph column dryer
  – Each primarily corn storage
  – Each turns approximately 2 1/2x per year
  – Similar housekeeping story from management
Where would you rather work?
Grain Handling Safeguards

• Technology
  – Temperature cables for monitoring grain quality
  – Motion, alignment, and bearing for legs and conveyors
  – Dust control
    • Pneumatic
    • Mineral Oil
  – Explosion venting of leg
Mineral Oil

• Strongly Encourage
  – Improved housekeeping
  – Reduced potential for dust explosion
  – Reduce emissions -- credit in PTE calculation
  – Safety

• Worth looking into
Summary

• High hazard industry
• Safety is critically important
• Continuous improvement
• Maintain and update plant & equipment
• Use owners manuals
• Use qualified contractors – still watch them
• Consider grain handling safeguards even when not required
Thanks