Safety & New Hires

Injuries that can impact a Business Legacy
Proud Father & Trophy Husband
3rd Generation Driller
Global Drilling SME: US Military & Labor Drilling Operations w/VEOLIA, SUEZ, Halliburton, Barrick, Kinross, & BHP
R&D – Training: Versa Drill & GEFCO Trainer - Educator - Advocate
Host - Writer - Podcaster The Driller Authorized OSHA Trainer
BD & Training Development - Venture Drilling Supply
We cannot control the Weather
We can control & manage conditions within our company.

EQUIPMENT, TOOLS, & MATERIALS

PROCESSES

PEOPLE MAKING GOOD CHOICES THROUGH AWARENESS, EDUCATION, PREPARATION & INSIGHTFUL SAFETY CULTURE.
Making Good Choices?

• **Hypothermia**
  • Potentially fatal condition caused by loss of body temperature.
  • Symptoms include fatigue, nausea, confusion, lightheaded, and profuse sweating.
  • Without medical treatment, the victim can lose consciousness and die.

• **Frostbite**
  Exposed skin can start to freeze at just 28 degrees Fahrenheit & deep frostbite can cause blood clots and even gangrene.
The Employment Field

161,262,000 Employed Americans
Americans seeking Employment: 5,247,000
Unemployment Rate of 3.4%
9 + Million Job Openings
5.6 Million Unemployed
Average Hourly Wage $27.00 - $28.00
Average Annual Salary $59,428
Construction Workforce in Drilling

- 7.9 Million Individuals Employed in all Construction
- 15% - 1.2 Million workers operate in an industry that requires drilling.
- 473,280 Americans work in construction and extraction occupations.
- 118,000 in Oil and Gas Drilling – 900,000 Oil & Gas worker's total
- 187,000 in mining - 573,000 mining worker's total.
- 257,990 as Operation Engineers and other construction equipment operators
- .25 % of all construction employment works on or near industrial drilling operations. Roughly 19,000 – Water Well, Geothermal, Cathodic, Environmental, Geotechnical.
Drilling Industry Hazards
Unsafe Acts Vs. Unsafe Conditions

• **Unsafe Act** - Any hazard created as a result of a human action or behavior.
  • ~80% of all injuries are caused from unsafe acts.

• **Unsafe Condition** - Any physical hazard related to equipment, materials, structures, or other physical elements of a worker’s environment
  • Only about 20% of injuries are caused by unsafe conditions.
Unsafe Conditions

- Poor Housekeeping
- Lack of Machine Guarding
- Poor Equipment Maintenance
- Defective Equipment or Tools
- Improper Materials Storage
- Slip and Fall Hazards

20% Of all Injuries have a cause in an Unsafe Condition
Unsafe Acts

Over 80% of all Injuries have a cause in Human Interaction or Behavior

- Lack of adequate training
- Improper work practices
- Poor work attitudes
- Shortcuts to save time
- Lack of proper equipment & tools
- Inadequate supervision
- Poor leadership
Serious or disabling injuries
Minor injuries
Damage accidents
Accidents with no injury or damage – the near-miss accidents
Loss time injuries in Construction
Cost of an Injury

- Average Struck by an object Direct Cost - $40,104.00
- Average Caught In Object Direct Cost – $47,076.00

The True cost of an Injury

$45,000.00 Direct Cost
$49,500.00 Indirect Cost
----------------------------------
94,500.00 Total

Consider additional work required to recover.

$300,000.00 ?
$600,000.00 ?
OSHA Safety Pays – Estimates include the following kinds of indirect costs.

- Any wages paid to injured workers for absences not covered by workers' compensation.
- The wage costs related to time lost through work stoppage associated with the worker injury.
- The overtime costs necessitated by the injury.
- Administrative time spent by supervisors, safety personnel, and clerical workers after an injury.
- Training costs for a replacement worker.

- Lost productivity related to work rescheduling, new employee learning curves, and accommodation of injured employees.
- Clean-up, repair, and replacement costs of damaged material, machinery, and property.

Some of the possible kinds of indirect costs not included in these estimates are:
- The costs of OSHA fines and any associated legal action.
- Third-party liability and legal costs;
- Worker pain and suffering.
- Loss of goodwill from bad publicity.

The average claim cost estimates are provided by National Council on Compensation Insurance, Inc. (NCCI). The data reflects the average cost of lost time workers' compensation insurance claims derived from unit statistical reports submitted to NCCI for policy years 2015-2017.
Pop Quiz!

All employers are required to notify OSHA when an employee is killed on the job or suffers a work-related hospitalization, amputation, or loss of an eye. A fatality must be reported within 8 hours. An in-patient hospitalization, amputation, or eye loss must be reported within 24 hours.
Amputation

OSHA recognizes amputation hazards as any piece of equipment that:
Rotates – Reciprocating - Cuts – Shear – Punches

• The costliest lost-time workers’ compensation claims by nature of injury are for those resulting from amputation. $126,033

• The next highest costs were for other trauma ($63,044), injuries resulting in fracture, crush, or dislocation ($62,240), and burns ($52,222)
## True Cost of Amputation, Loss of Eye, Hospitalization

<table>
<thead>
<tr>
<th>Injury Type</th>
<th>Instances</th>
<th>Direct Cost</th>
<th>Indirect Cost</th>
<th>Total Cost</th>
<th>Additional Sale (Indirect)</th>
<th>Additional Sale (Total)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amputation</td>
<td>1</td>
<td>$126,033</td>
<td>$138,636</td>
<td>$264,669</td>
<td>$924,242</td>
<td>$1,764,459</td>
</tr>
<tr>
<td>Fracture</td>
<td>1</td>
<td>$63,044</td>
<td>$69,348</td>
<td>$132,392</td>
<td>$462,322</td>
<td>$882,613</td>
</tr>
<tr>
<td>Crush</td>
<td>1</td>
<td>$62,240</td>
<td>$68,464</td>
<td>$130,704</td>
<td>$456,426</td>
<td>$871,360</td>
</tr>
<tr>
<td>Burns</td>
<td>1</td>
<td>$52,222</td>
<td>$57,444</td>
<td>$109,666</td>
<td>$382,961</td>
<td>$731,106</td>
</tr>
</tbody>
</table>
Ring Finger Amputation — Caught in Table of Rig

$277,000 in sales to recover the loss.
Fingers Crushed by Colum Pipe

$800,000 in sales to recover the loss.
$2,100,000.00 in sales to recover the loss.
Self Reflection on Personal Injuries

1. Look at your hands.
2. Look at your scars.
3. The scar is a story of misfortune
   • Were you lucky?
   • Did you learn an ultimate lesson?

• Good Choices
• Good Processes
• Situational Awareness
What weighs heavily on Brock’s Safety Shoulders?
Overexertion

Mental and Physical Preparation
• Jobsite Tough Employee Contest
• Poor Choices
• Tempo of project completion.

• Overexertion of your muscles is a leading cause of time-loss injuries for construction workers.
• Overexertion occurs because the load being lifted, carried, pushed, pulled, or otherwise handled exceeds the body’s limits.
• Overexertion can cause tearing or stretching of the muscles, tendons, and ligaments.
Over Exertion – Repetitive Stress

- Ergonomics
  - Bending,
  - Twisting,
  - Turning movements
  - Winter increases level of risk.

- Weight and bulkiness of objects
- Restrictive Clothing
- Cold Muscles
• Types of injuries from poor ergonomics.
  
  • Sprains, strains, tears
  
  • Soreness and pain
  
  • Bruises and contusions
Heatstroke

Signs of heatstroke:
• Rapid pulse
• Hot, red skin
• Victim stops sweating
• Possible mental confusion, decreased alertness & blurred judgment

Heatstroke can be extremely serious and lead to brain damage or even death if not treated promptly and properly.
Top Hazard we take for granted

39 Fatalities 2022
All Men
NCOSH welcomes OSHA action on trench collapses

DCN-JOC News Services  July 22, 2022

CHARLOTTE COUNTY, Fla. — Charlotte County officials do not believe there was criminal or foul play involved in Monday’s trench collapse that killed two workmen.

What to know:

- 2 workers killed while working on water line identified
- Task Force Six called to help in rescue effort
- OSHA begins its own investigation
- Cause unknown but foul play/criminal intent not suspected

Just before noon Tuesday, officials identified the victims as 41-year-old Marcos Santiz-Lopez and 25-year old Brandon M. Coburn.
Employer faces jail time for worker's death in trench collapse

Mar 5, 2022 – KING COUNTY, Wash. – Six years after a 36-year-old construction worker died in a trench collapse, the man's boss will serve jail time.

Missing: michigan | Must include: michigan

Jail time becoming more frequent for habitually unsafe employers

“We've known for years that proper trench and excavation procedures save lives. There's no excuse for not following them and putting workers' lives at risk.”
LOWELL, Mich. — Two men who died last week after a trench collapsed in western Michigan have been identified as brothers.

The Bowne Township Fire Department identified the deceased men as Pete Bencker, 59, and Ron Bencker, 68, both from Alto.

Fire Chief Rick Vriesenga said Pete Bencker served 29 years on the Bowne Township Fire Department before retiring last year.

He and his brother were working on a 14-foot deep trench that was being dug for drainage where a pole barn was being built when it collapsed Friday in Lowell Township, just east of Grand Rapids.
Preventing trench collapses is so important because unlike other types of on-the-job injuries, workers rarely survive them. One cubic yard of soil can weigh upwards of 3,000 pounds—a force strong enough to crush limbs and force air from the lungs. When a trench collapses with workers inside, the situation often goes from rescue attempt to recovery effort within minutes. To see how quickly things can go wrong, see our previous article, “Watch How Quick a Trench Can Collapse.”

If the threat of an OSHA fine isn’t enough to convince contractors to work safely, the threat of jail time could be. The owner of two New York construction companies is facing up to 15 years in jail after a wall collapsed at an excavation site, killing one worker and seriously injuring two others. In that case, prosecutors allege that the owner repeatedly ignored requests from workers to provide shoring and even instructed workers to excavate beyond the area included on their permits.

In all of these cases, owners opened themselves up to criminal charges by repeatedly ignoring OSHA standards and failing to implement proper construction procedures after being cited in the past. This pattern of behavior made it clear that awareness of how to work safely wasn’t the issue. Failing to make safety and health a priority on the jobsite had fatal consequences for their workers—it should also have serious consequences for owners who ignore the law.
• Trenching standards require protective systems on trenches deeper than 5 feet and soil and other materials kept at least 2 feet from the edge of a trench.

• Additionally, trenches must be inspected by a knowledgeable person, be free of standing water and atmospheric hazards and have a safe means of entering and exiting prior to allowing a worker to enter.
The employer shall select and construct:

- Slopes and configurations of sloping and benching systems
- Support systems, shield systems, and other protective systems

- **Shield** - can be permanent or portable. Also known as trench box or trench shield.
- **Shoring** - such as metal hydraulic, mechanical or timber shoring system that supports the sides
- **Sloping** - form sides of an excavation that are inclined away from the excavation
Excavation Hazards

• Cave-ins are the greatest risk
• Other hazards include:
  ▪ Asphyxiation due to a lack of oxygen
  ▪ Inhalation of toxic materials
  ▪ Moving machinery near the edge of the excavation can cause a collapse
  ▪ Accidental severing of underground utility lines
  ▪ Fire
SOIL CLASSIFICATION

SOIL TYPES

Type A
The most stable soil, composed of clay, silty clay, clay loam and sandy clay. Very cohesive as well.

Type B
Composed of silt, silty loam, sandy loam, and granular cohesive solids including angular gravel (crushed rock).

Type C
The least stable soil. Composed of granular soils, including sand, gravel, loamy sand, submerged soil, and rock.

Stable Rock
This natural solid mineral can be excavated with vertical sides and remains intact while exposed.
Protective System

A well-designed protective system
Correct design of:
- sloping and benching systems
- support systems
- shield systems
- other protective systems

Appropriate handling of materials and equipment

Attention to correct installation and removal

Protection of employees at excavations
Confined Spaces

What are you and your team breathing?
Confined Space Hazards

Suffocation

- Confined spaces
- Air quality monitor
  - Percent oxygen
- In the past year, there were 250 fatalities caused by confined spaces.
- In many situations, more than one employee was lost attempting to save their colleague.
Definitions

• Confined space means a space that:
  
  • (1) Is large enough and so configured that an employee can bodily enter it;

  • (2) Has limited or restricted means for entry and exit; and

  • (3) Is not designed for continuous employee occupancy.
Other Hazards

- Engulfment
- Falling objects
- Temperature extremes
- Noise
- Moving equipment
- Electrical hazards
- Process liquids and steam
- Animals and insects
POTENTIAL HAZARDS

• Deficient or enriched oxygen
  • Safe level: 19.5% - 23.5%
    • 16% Judgement Impaired – 12%
      unconscious –
    • 6% dead

• Combustible, flammable, and explosive atmospheres
  • Lower and Upper Explosive Limit

• Toxic gases and vapors

• Corrosive chemicals or biological agents
Chemical Asphyxiant

*Carbon Monoxide* – “The Silent Killer”

*Hydrogen Sulfide* – Rotten Eggs
Carbon Monoxide (CO)

- Odorless, colorless and toxic gas.
- Found in combustion exhaust.
<table>
<thead>
<tr>
<th>% Volume of Air</th>
<th>ppm</th>
<th>Health Effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>.02</td>
<td>200</td>
<td>Possibly headache, mild frontal in 2-3 hrs.</td>
</tr>
<tr>
<td>.04</td>
<td>400</td>
<td>Headache, frontal, and nausea after 1-2 hrs.</td>
</tr>
<tr>
<td>.08</td>
<td>800</td>
<td>Headache, dizziness and nausea in 3/4 hour, collapse and possible unconsciousness in 2 hrs.</td>
</tr>
<tr>
<td>.12</td>
<td>1200</td>
<td>Headache, dizziness and nausea in 20 min.; collapse, unconsciousness, possibly death in 2 hr.</td>
</tr>
</tbody>
</table>
Hydrogen Sulfide

- Colorless, very poisonous, flammable gas.
- Characteristic foul odor of rotten eggs.
- Bacterial breakdown of organic matter in the absence of oxygen.
- Found in swamps and sewers (manholes).
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<tr>
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<th>ppm</th>
<th>Health Effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>.0002</td>
<td>.02</td>
<td>Odor detected by human nose.</td>
</tr>
<tr>
<td>.001</td>
<td>10</td>
<td>Irritation of the eyes, nose and throat.</td>
</tr>
<tr>
<td>.005</td>
<td>50</td>
<td>Headache, dizziness and nausea; coughing and breathing difficulty.</td>
</tr>
<tr>
<td>.01</td>
<td>100</td>
<td>Severe respiratory tract irritation, eye irritation, convulsions, coma &amp; death in severe cases.</td>
</tr>
</tbody>
</table>
A competent person must evaluate all confined spaces and determine if spaces are permit spaces.

A confined space permit must be completed for any confined space entry or investigation.

A permit must be completed and monitoring must be conducted around the permit space before any mechanical device (selfie stick, ROV, etc.) is placed inside a permit space for investigation purposes.

Continuous ventilation and air monitoring are required in permit spaces.

All employees must be trained where permit spaces are to be entered.
Standard Operating Procedure
Considerations

• New people doing the task.
• Tasks that have changed.
• Regularly performed tasks.
• Unique Tasks.
• Hazardous Conditions.
• Any task done under a safety "Work permit" condition (e.g. permit required confined space, hot work permits, Lock Out/Tag Out).
Pop Quiz - What are the OSHA Focus 5?

Mental Health

- Males in construction: Have a suicide rate of 45.3 deaths per 100,000 people
- Construction workers: Commit suicide at a rate of 53.3 per 100,000 workers
- 2.5% of male construction workers report suicidal ideation
- 30% of construction workers report regular psychological distress
- 8.9% of construction workers have a mood-affecting condition, such as depression
- 988 Suicide Hotline – Text, Call, Chat Online
Why didn’t I say stop?
Common Distractions

- Weather – Project Wrap Up
- Relationships
- Money Issues
- Vacation – Holidays – Hunting Season
- Family Emergency
What prevents an employee from saying STOP!

We have always done it that way.

Fear of being wrong.

Experience must be correct

Pain is temporary but pride is forever.

Physically here – Mentally gone.
STOP!
Safety Culture starts with trust.

Stop Work Authority

Every individual on site has the right to stop an unsafe act

- Prevent catastrophic events
- Educate everyone onsite
- Create trust among crewmembers on site
- Minimize Risk Eliminate Accidents
1. Monitor
   • Monitor the plan & collect feedback from the field.

2. Evaluate
   • Compare safety performance against the plan

3. Improve
   • Make changes anytime necessary
   • Recognize success and failures.
     • Reprimand
     • Celebrate
Good Choices or Bad Choices

Employees make good choices through knowledge and trust. Our teams can make good choices on-site when processes are clearly defined, and they trust that their team can say stop any time an unsafe act occurs.
Questions? Lessons Learned. Knowledge to share?
Thank You
Together, we can develop a better safety culture in the drilling industry.

Thanks
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