SAFETY SOLUTIONS
International, Inc.
OCCUPATIONAL SAFETY AND HEALTH SERVICES
CREATING A CULTURE OF PREVENTION – THE PATH TO ZERO©

19751 E. Mainstreet, Suite 337
Parker, Colorado 80138
Office: 303.841.0853
Fax: 303.840.4954
www.safetysolutionsintl.com

Fall Protection

Fall Protection Or Not???

You Decide

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You Decide

Working at Height

… the good? old days …

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Working at height has always been a hazardous business …

Gravity has the same strength as it had in the 1930's …

Then, as now, limbs were just as prone to break in a fall

vital organs to tear and crush …

skulls - to crack …

brains - to splatter …

but you wouldn't necessarily know it from the following pictures

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Eiffel Tower

Electrical work

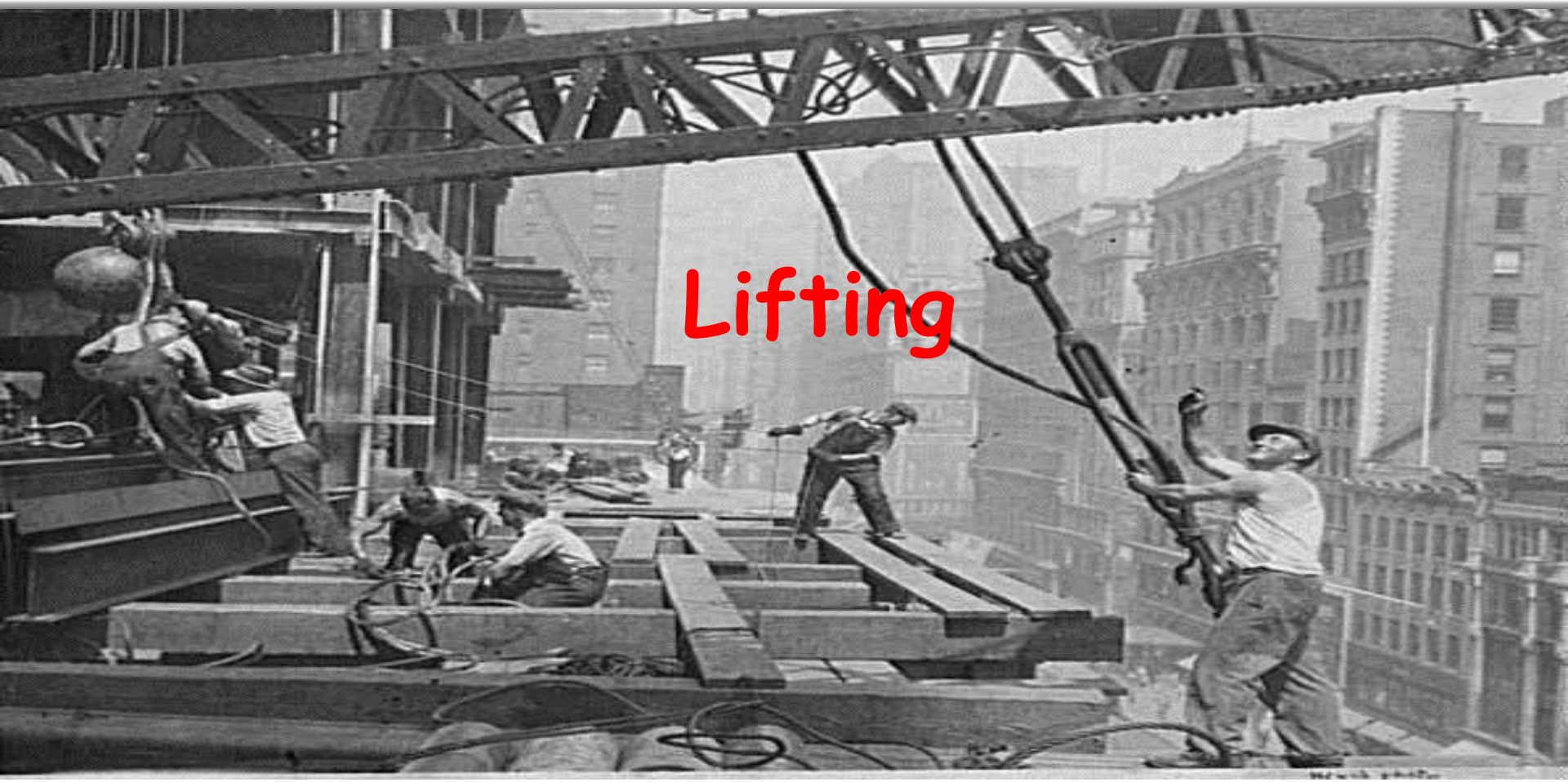
Is this how we would work on this project today?

NO!!!

Empire State Building

Industry estimates for construction fatalities on skyscrapers in the 1930's was one death per floor. Therefore the budgetary plans for the construction of the Empire State Building was 102 fatalities.

Empire State Building



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Empire State Building

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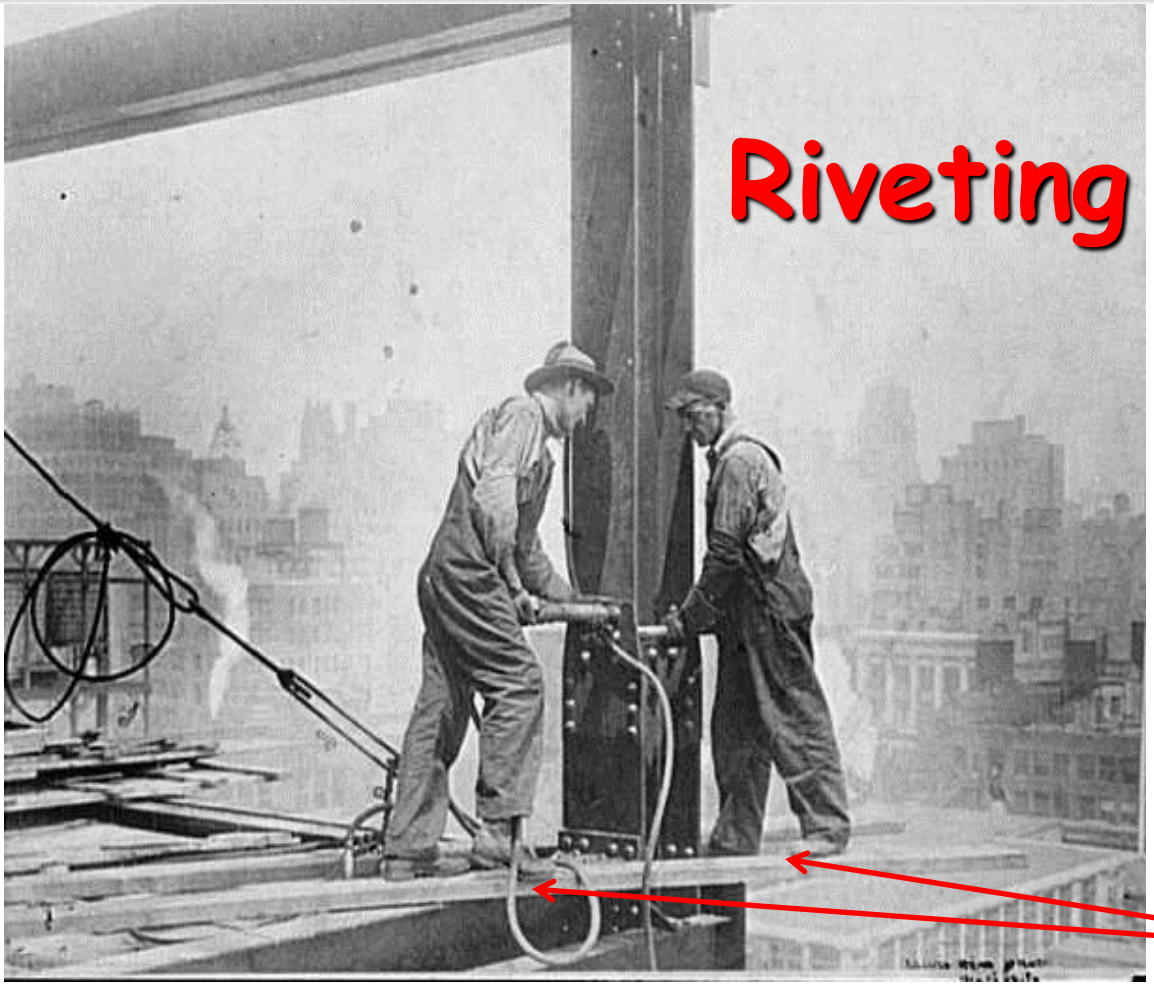
Empire State Building



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Empire State Building

Bolting

Empire State Building

Empire State Building

Inspecting

Empire State Building

Hanging about

Golden Gate Bridge

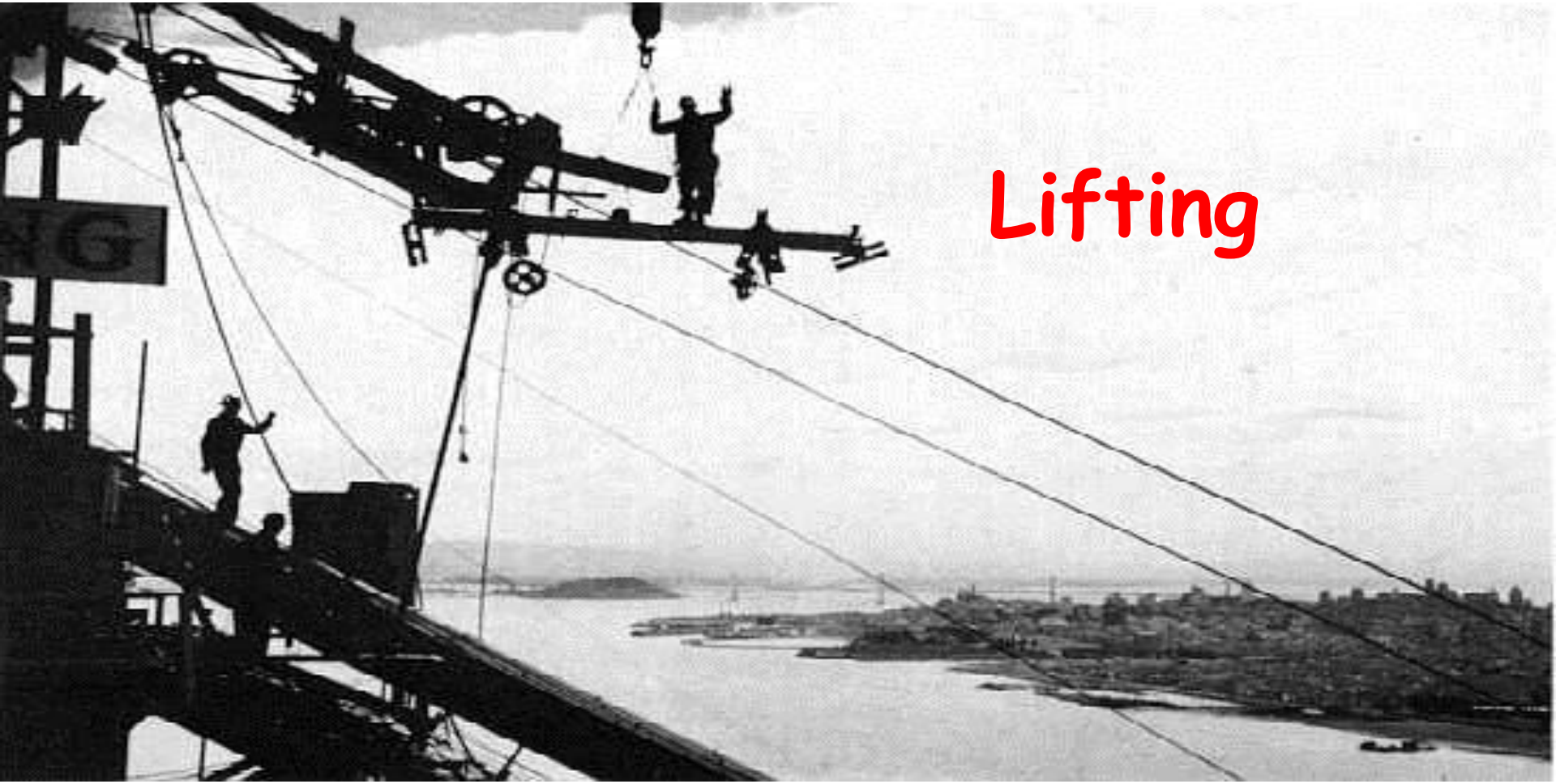
One of the most interesting facts about the Golden Gate Bridge is that only eleven workers died during construction, a new safety record for the time. In the 1930s, bridge builders expected 1 fatality per $1 million in construction costs, and builders expected 35 people to die while building the Golden Gate Bridge.

Golden Gate Bridge

One of the bridge's safety innovations was a net suspended under the floor. This net saved the lives of 19 men during construction, these men are often called members of the "**Half Way to Hell Club**."

Golden Gate Bridge

Golden Gate Bridge



Not wearing fall protection is simply not expectable any more.

No engineer or project manager would dare to estimate 1 fatality per construction floor or to estimate 1 fatality per 1 million dollars in cost. In fact not even 1 fatality per 10 million dollars in cost.

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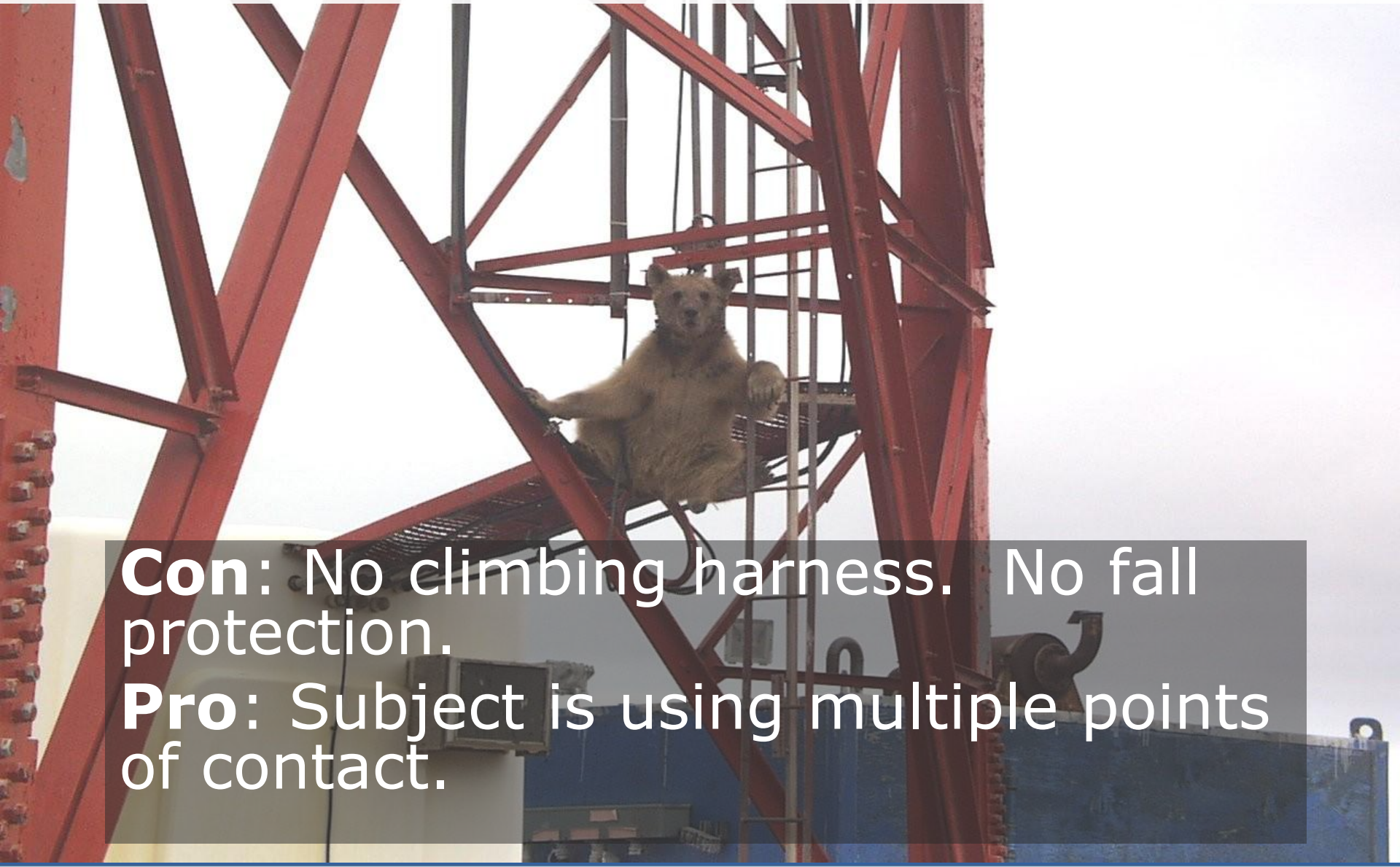
Hoover Dam bridge $114 million dollars


Aizhai Bridge $208 million
© AFP/Getty Images

Bears and Ladders

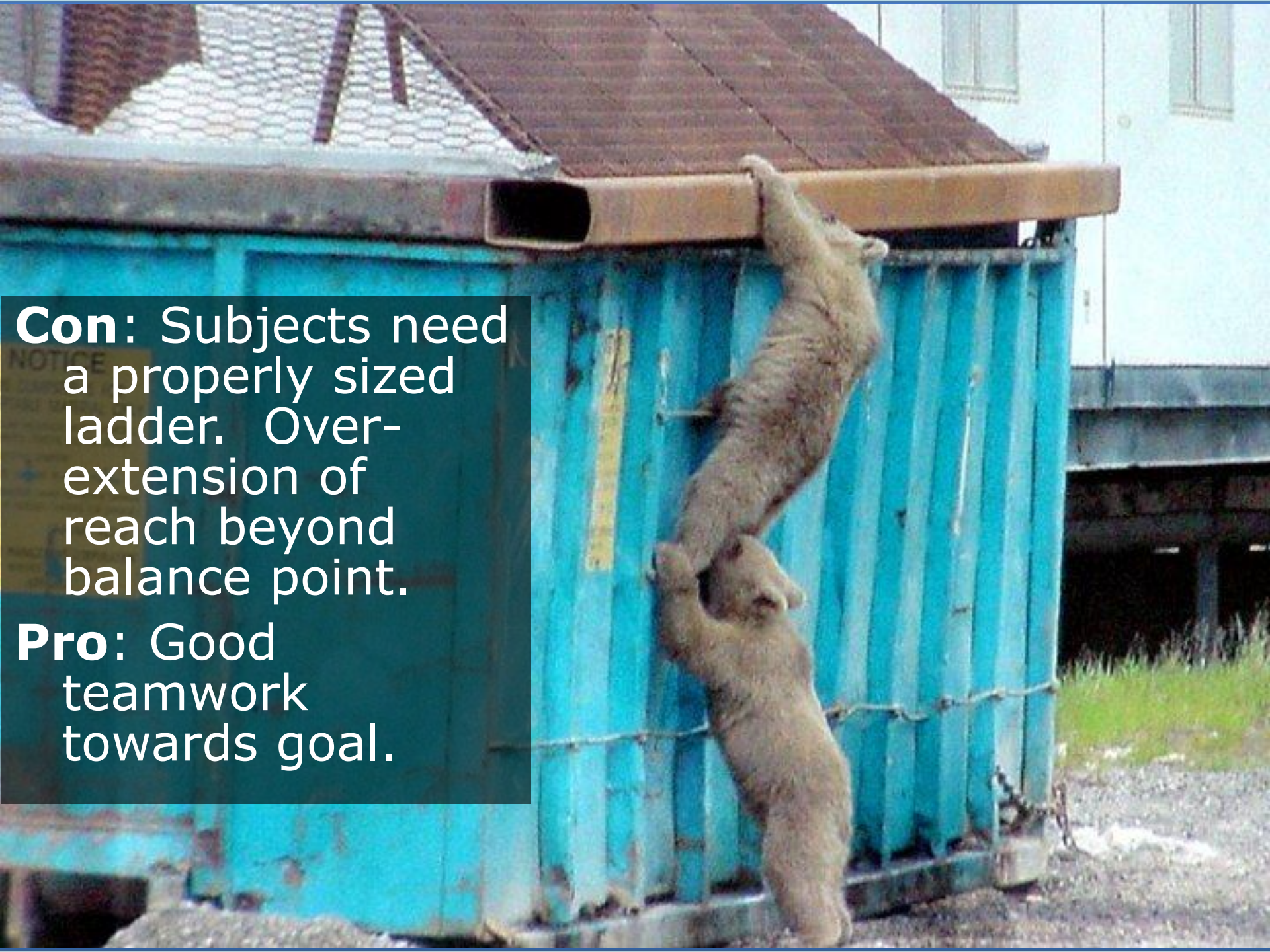
Bears and Ladders



Con: No climbing harness. No fall protection.

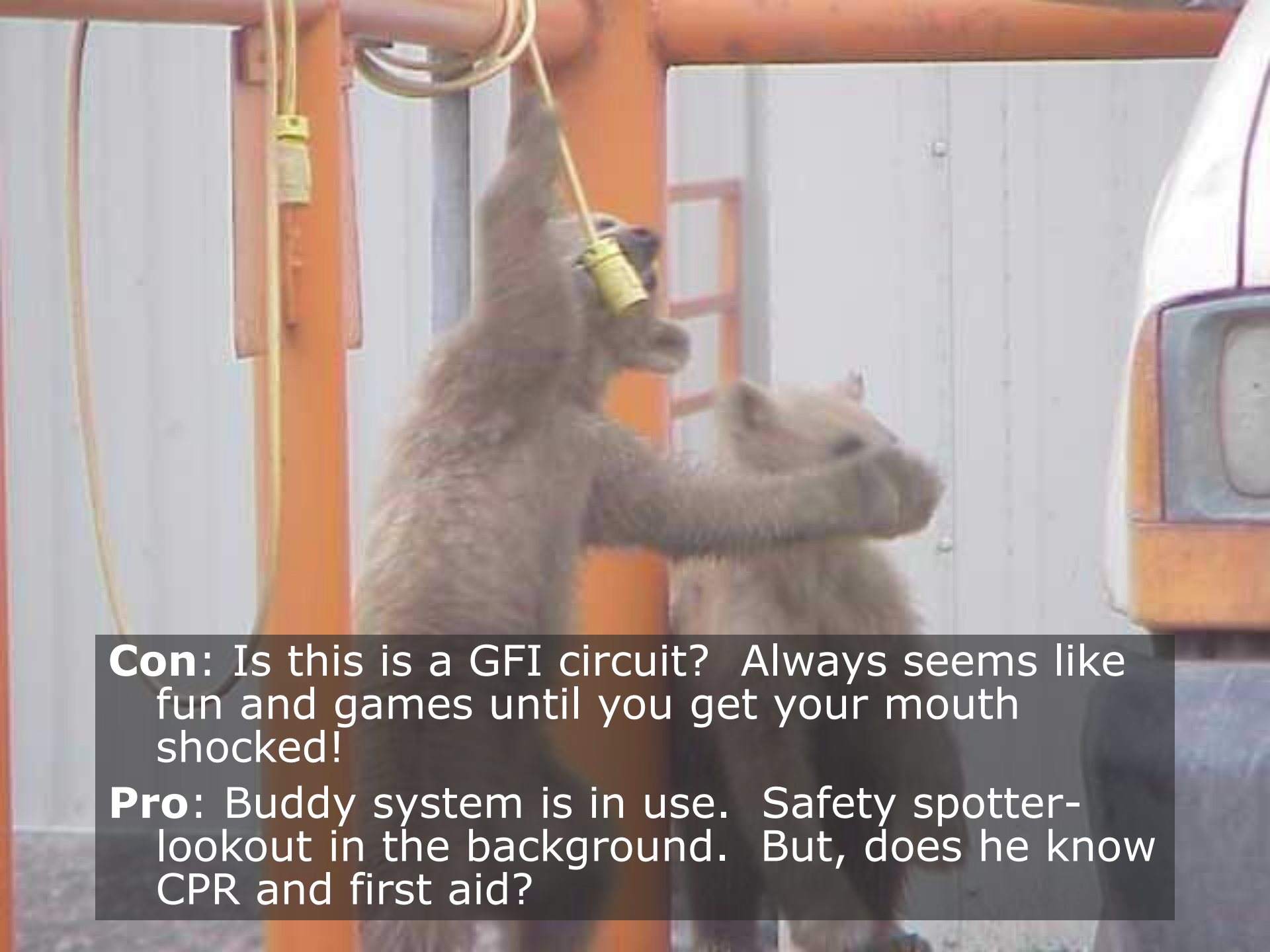
Pro: Subject is using multiple points of contact.


NOTICE



Con: Subjects need a properly sized ladder. Over-extension of reach beyond balance point.

Pro: Good teamwork towards goal.



Con: Is this is a GFI circuit? Always seems like fun and games until you get your mouth shocked!

Pro: Buddy system is in use. Safety spotter-lookout in the background. But, does he know CPR and first aid?


324
94-324
CAP
400
BBLS

Con: No safety harnesses. Improper footwear. Climbing in tandem

Pro: Top bear checking on status of co-worker. Three points of contact at all times.


4X4
Schlumberger

Con: Crew didn't do 360- degree walk around. Crewmember riding in back of truck. Minors not permitted in oil fields.

Pro: Checking tail-light bulbs prior to driving.

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Con: Not a designated walkway. No guard rail.

Pro: Avoided slipping on icy pathway below.

A man builds a house with all 4 sides facing south. A bear walks past the house. What color is the bear?

And now back to fall protection, which one is correct???

- **57.15005 , 77.1710 (g)**
  - Safety belts and lines shall be worn when persons work where there is a danger of falling.
- **29.1926.501(b)(1)**
  - "Unprotected sides and edges." Each employee on a walking/working surface (horizontal and vertical surface) with an unprotected side or edge which is **6 feet** (1.8 m) or more above a lower level shall be protected from falling by the use of guardrail systems, safety net systems, or personal fall arrest systems.

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And now back to fall protection, which one is correct???

- **57.15005 , 77.1710 (g)** **(MSHA)**
  - Safety belts and lines shall be worn when persons work where there is a danger of falling.
- **29.1926.501(b)(1)** **(OSHA)**
  - "Unprotected sides and edges." Each employee on a walking/working surface (horizontal and vertical surface) with an unprotected side or edge which is **6 feet** (1.8 m) or more above a lower level shall be protected from falling by the use of guardrail systems, safety net systems, or personal fall arrest systems.

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MSHA clarifies guidance on fall protection from elevated walkways

- On June 22, 2012 MSHA issued a Program Policy Letter (PPL) to clarify compliance with safety belts and lines (56/57.15005) when there is a risk of falling. The guidance states that, as in the OSHA standard, MSHA in most cases will see fall protection as needed for each employee on a walking/working surface with an unprotected side or edge which is six feet or more above a lower level. Industry representatives requested this clarification due to conflicting requirements between MSHA and OSHA rules. This PPL applies to surface and underground metal and nonmetal mine operators, contractors, equipment manufacturers, miners, miners' representatives and Metal and Nonmetal Mine Safety and Health enforcement personnel.

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Consult your company policies, but realize that people can get seriously hurt from falling from even short distances.

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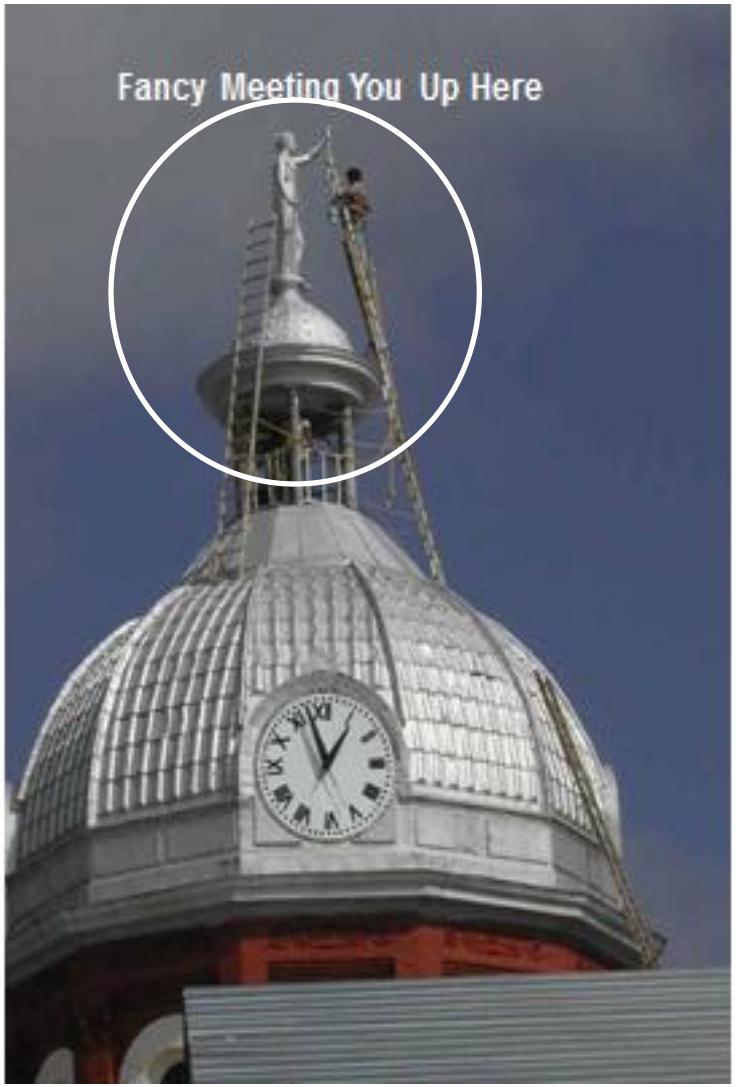
Does he really think that small piece of wire will hold him up? Plus he is attached to the water sprinkler system?

After he falls off the ladder, will he then fall off the balcony?

After he falls off the roof, the lanyard will then hit him in the head?

There are much safer ways to do this work.



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If 1 ladder is good, are 2 ladders better?

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Are you ready for a nice safe day??

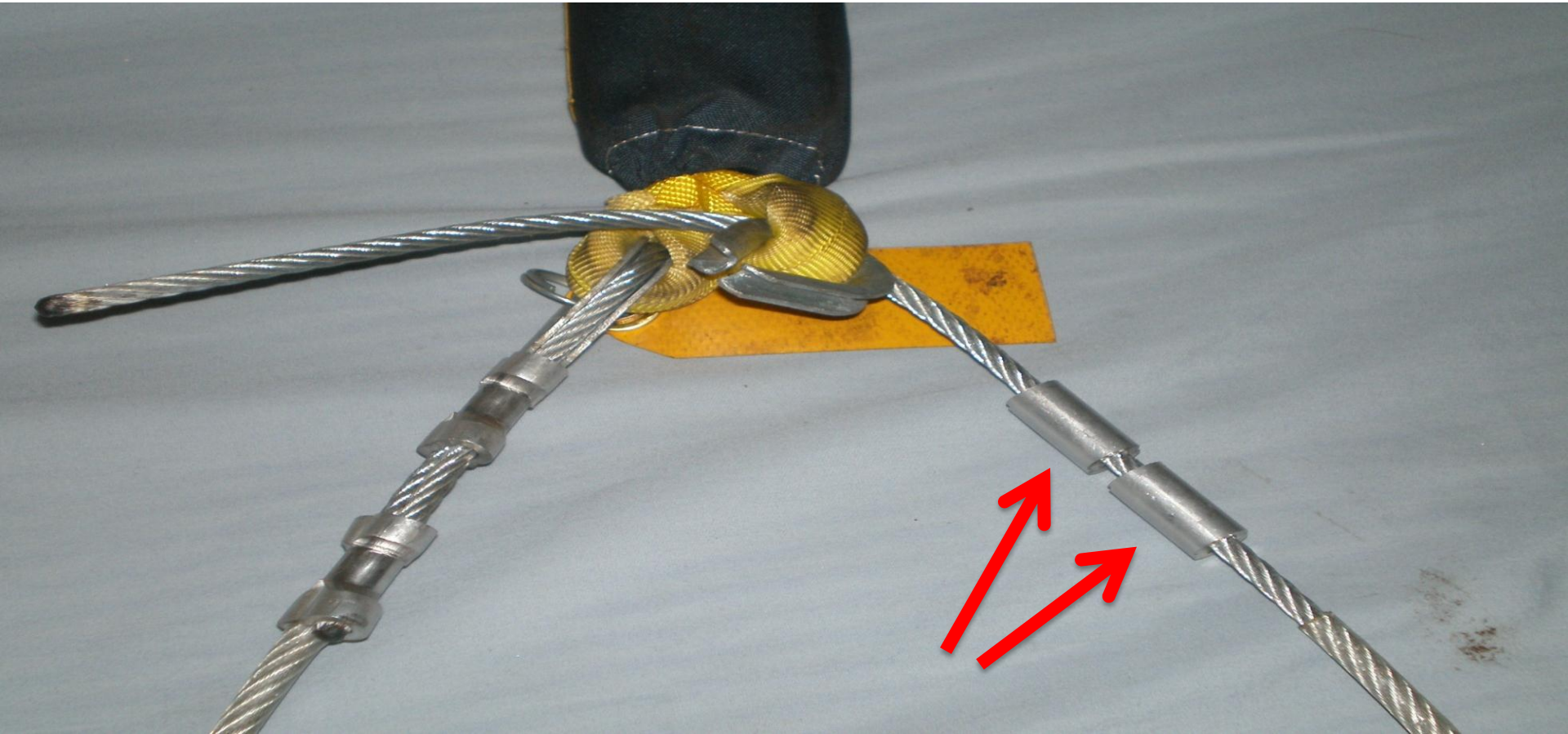
How about now???

- An employee was getting ready to use this brand new lanyard.
- But, before using it he did a full inspection of the lanyard.

The employee immediately quarantined the lanyard, to ensure no one uses it and notified the Safety Dept.

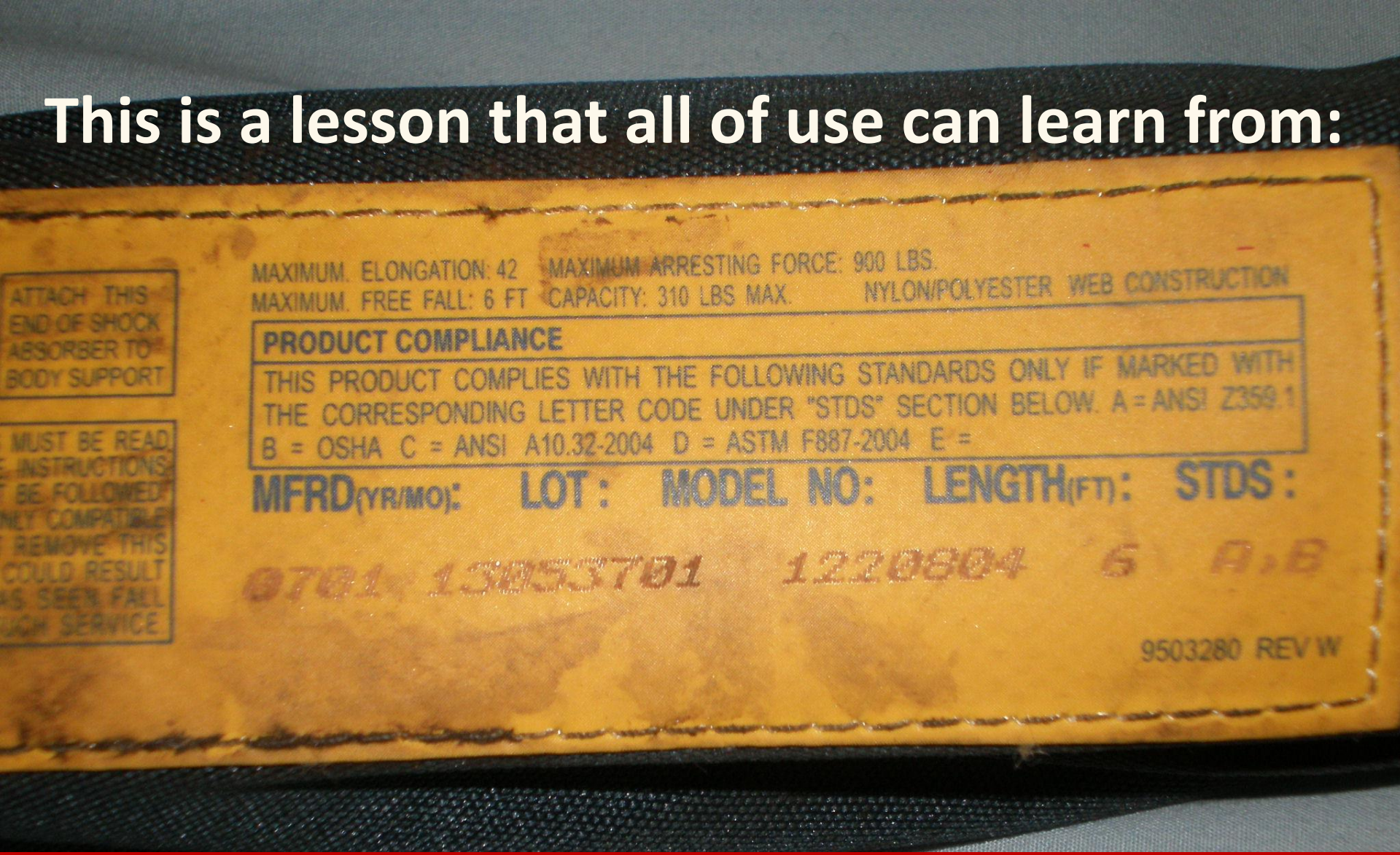

This is a good example of why we inspect our equipment, new or old, before we use it.

The lanyard was taken from the store, in a new package and was never used. You can see where all the connections are crimped – except the 2 for the one lead (see arrows)



It would be easy to miss this defect if you conducted a rapid equipment inspection or did not inspect your equipment at all. If the time came when you needed this piece of equipment to save your life it would **fail** as the wire pulls free.

This is a lesson that all of use can learn from:



"Just because a piece of equipment is new does not make it safe".

Inspect all of your equipment before using it. This employee by **"paying attention and following basic safety rules"** obverted a possible disaster. For his performance the employee was awarded "Safety Leader of the Month".

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But surely that type of manufacturing error can only happen once and not on anything recent???

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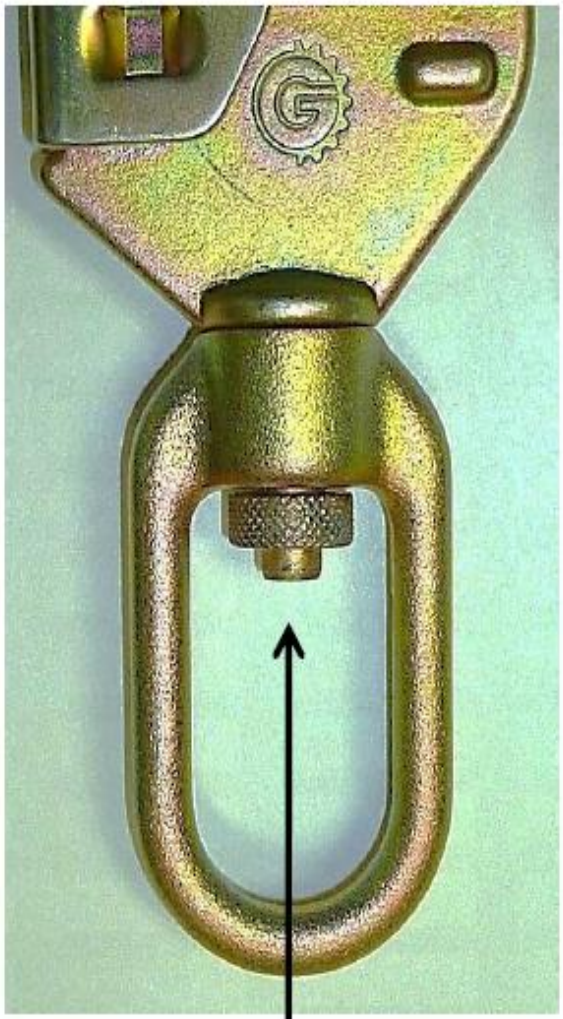
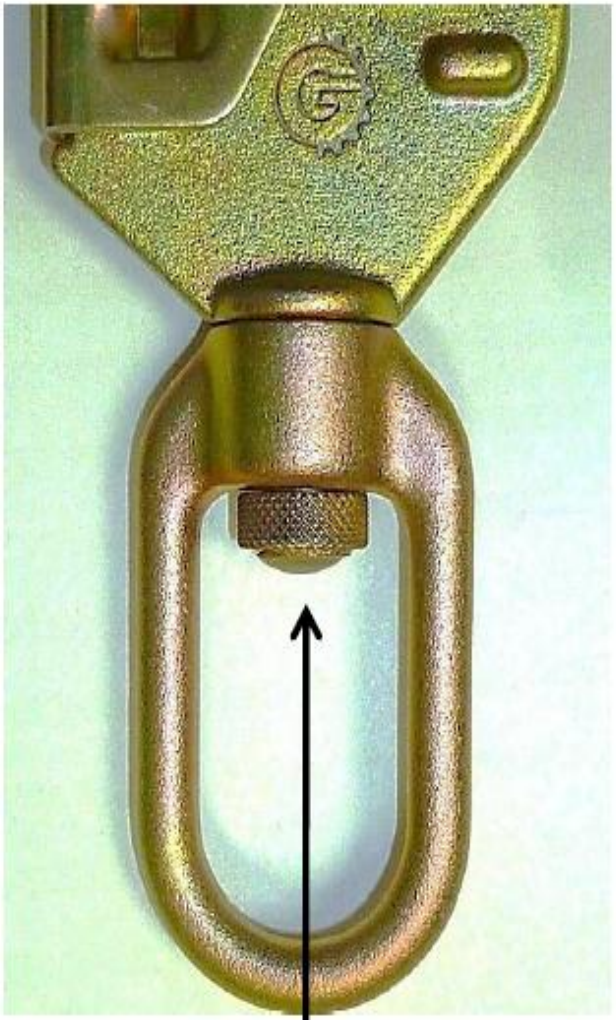
DEFECTIVE CONDITION

Manufactured between 8/26/2011 and 6/25/2012

NORMAL CONDITION





BAD HOOK. STEM PROTRUDES STRAIGHT THROUGH THE NUT. STEM HAS NO MUSHROOM SHAPE FLARED OVER THE NUT. NUT CAN BACK OFF THREADED STEM.

NORMAL SWAGED HOOK. GOOD HOOK. STEM FLATTENED IN A MUSHROOM SHAPE. ANY SORT OF SWAGE MEANS HOOK IS GOOD. NUT CANNOT BACK OFF STEM.

Manufactured on June 6th, 2012

CORRECT

D-ring is behind the webbing

INCORRECT

D-ring is only held by the plastic

I bet he wishes he checked out his equipment first.

Falling Material Fatality

On January 6, 2009, a 41 year-old laborer with 3 years of experience was injured at a sand and gravel operation. The victim was operating a skid steer loader underneath a belt conveyor that was being dismantled. Two coworkers were in an elevated manlift removing a 12-foot piece of 4-inch metal tubing from the leg supports of the belt conveyor frame. The tubing fell into the front of the skid steer loader as it approached the work area, striking the victim. He was hospitalized and died on January 9, 2009.

The red line shows the original location of the tubing, the white line shows where it landed, inside the cab.

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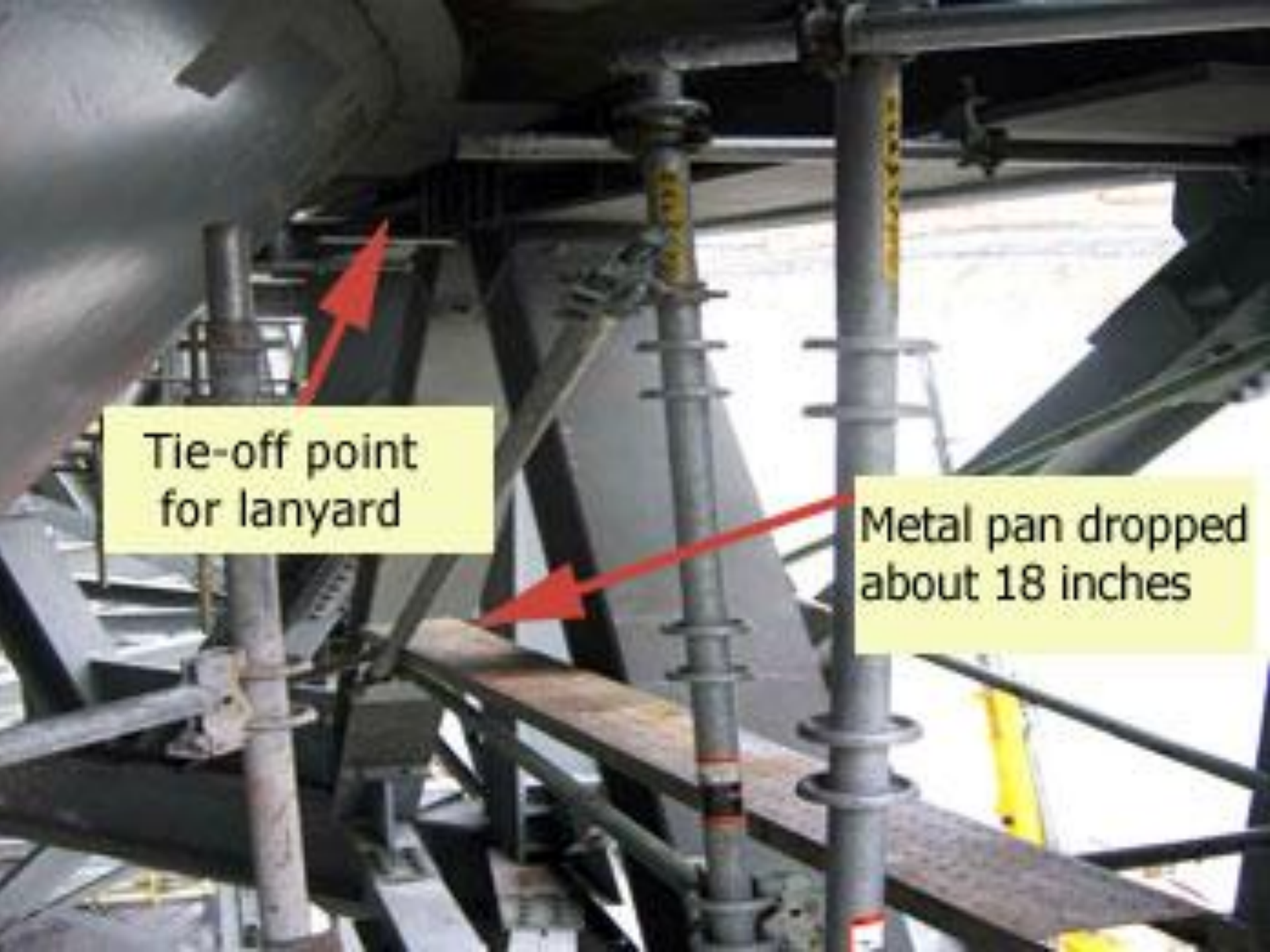
Best Practices

- Establish and review procedures to ensure all possible hazards have been identified and appropriate controls are in place to protect persons before beginning work.
- Discuss procedures with all persons present in the work area.
- Establish policies to ensure that barricades or warning signs are installed to prohibit access and protect persons from falling object hazards.
- Remove all persons from beneath the area where overhead work is being performed.

Fall of Person Fatality

- On April 14, 2009, a 38 - year old contractor carpenter with 8 years of experience was fatally injured at a cement plant under construction. While dismantling a section of scaffolding, the victim lost his balance and fell when one end of the metal pan on which he was standing shifted unexpectedly. As he fell backward, the victim's safety lanyard slipped off the end of the horizontal scaffold to which he was tied.


Tie-off point for lanyard
Metal pan dropped about 18 inches

Best Practices

- Train persons to recognize the hazards associated with the type of scaffold being used and how to control or minimize those hazards.
- Wear fall protection where there is a danger of falling.
- Where possible anchor fall protection to permanent support structure.
- Follow the manufacturer's procedures for assembly and disassembly of scaffold systems.
- Ensure that scaffolding is properly connected and braced to prevent side sway.
- Prior to using scaffolding, inspect the structure to ensure that it has not been altered.

Falling Material Fatality

- On April 21, 2009, a 51-year old contract laborer with 3 years of experience was fatally injured at a sand and gravel dredging operation. The victim was inside an excavation ditch while an excavator was maneuvering a concrete box into place. The chain used to attach the four leg sling from the box to the excavator broke. The box fell into the hole and struck the victim crushing him.

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Best Practices

- Communicate lift plans to all persons working in the lift zone to ensure that no one is under a suspended load.
- Stay clear of a suspended load and never ever get under a suspended load.
- Attach taglines to loads that may require steadying or guidance while suspended.
- Use sling or chain assemblies (rigging) specifically intended for lifting and adequately rated for the loads being lifted.
- Carefully inspect all rigging prior to each use.

Fall of Person Fatality

- On August 27, 2009, a 54 year-old contract truck driver with 33 years of experience was fatally injured at a lime operation. The victim, wearing a fall protection harness and an attached lanyard, was found partially suspended on the top of a bulk trailer. He had been working on top of the trailer, closing hatch covers, when the incident occurred.


He was found
hanging here.

Best Practices

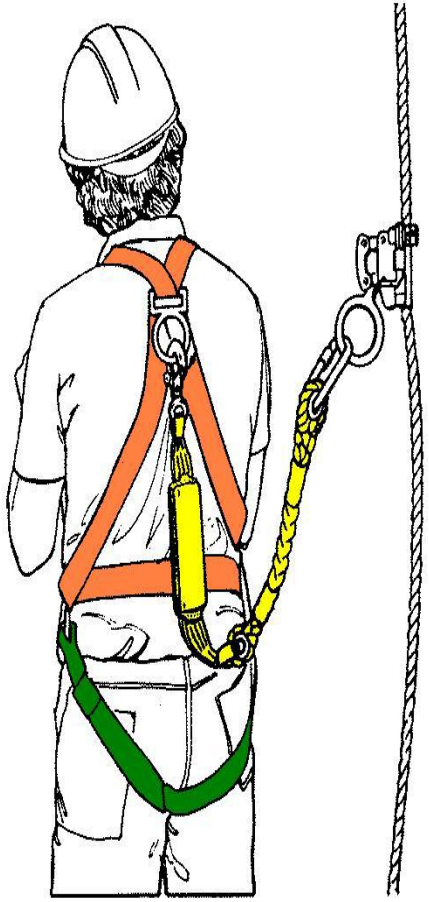
- Pneumatically actuated ports for dry bulk trailers are available to allow remote operation and keep truck drivers on the ground.
- Prior to beginning work, identify all hazards and use appropriate controls to protect persons.
- When wearing fall protection, ensure it is properly adjusted to fit the user.
- When working where hazardous conditions exist, maintain communications or contact with other persons.
- Keep work surfaces free of dust, water, and tripping hazards.
- Wear laced shoes with appropriate soles for the work surface.

Suspension Trauma

- Even if a worker survives the fall while in a full body harness, the worker could still have severe problems.
- One of them could be suspension trauma (insufficient blood flow to the heart and a buildup of toxic chemicals in the blood that pooled in the legs.
- Death can occur in as little as 5 minutes.
- Rescue plans for suspended workers is a MUST.

Suspension Trauma

- Wearing a properly inspected and a properly installed full body fall protection harness is the first step. (review all instruction manuals)
- Be sure that your harness is securely attached to a proper type of lanyard (with a shock absorber or fall arrestor).
- Be sure that the lanyard is affixed to a proper anchor or anchorage system.
  - Anchorages shall be capable of supporting at least 5,000 pounds (22.24 Kn) per employee attached.



Suspension Trauma

- Some harnesses come with step straps already attached. If not after market step straps are available and they are very easy to install.

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Fall of Person Fatality

- On Thursday, February 26, 2009, a 50-year old contractor with no mining experience was fatally injured when he fell from a step ladder. The victim was standing on forth step of a 10 foot step ladder while assisting a co-worker with the installation of a rolling steel overhead door. The two contractors were positioned on either side the door when it began to roll from the fully opened position. The door struck the ladder, causing the victim to fall, striking his head on the concrete pad. He was wearing a harness, but the lanyard was not anchored.


14'
20'

Best Practices

- Conduct a Risk Assessment before beginning any task; evaluate the work procedures, identify all possible hazards, and take steps to perform the task safely. **SLAM** it. Stop, Look, Analyze, and Manage.
- Position ladders from moving objects, or from being bumped or knocked over.
- Securely block equipment from motion when working around it.
- Use fall protection and tie off where danger from falling exists.
- Examine all tools, including ladders for defects and remove any defective tool from the work area. Assure that moving parts operate freely without binding or excessive play.

Fall of Person Fatality

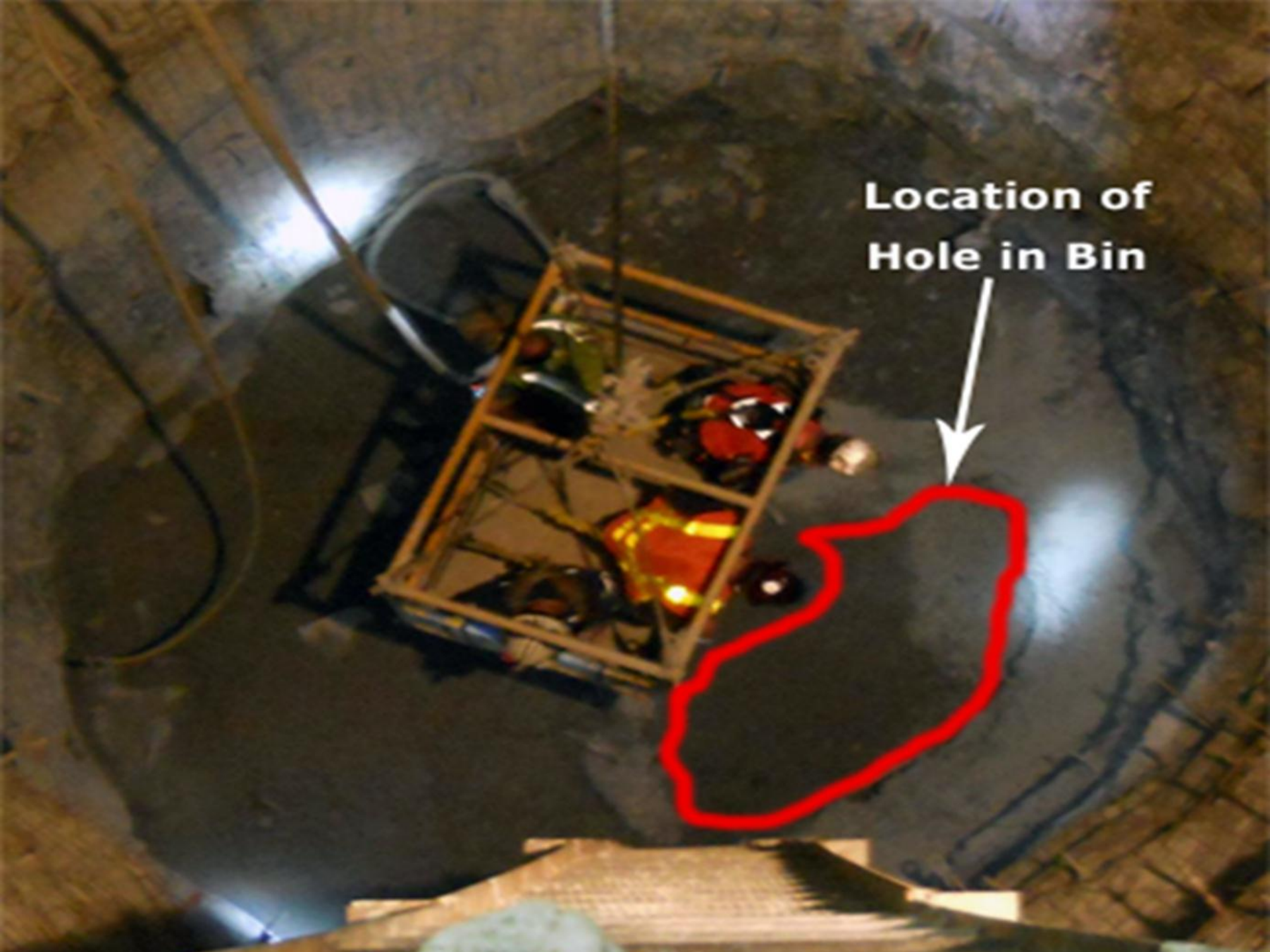
- On September 23, 2009, a 38 year old contractor miner with 10 years of experience was fatally injured while working at a shaft construction project. The victim and four other employees were located on the top deck of a 2-deck work platform that was suspended in the shaft. He was not wearing fall protection and fell through an opening in the center of the top deck of the work platform to the bottom of the shaft 38 feet below.

Best Practices

- Always wear, and use, suitable fall protection when positioned or working where fall hazards exist.
- Assure that fall protection systems for multiple workers allow for independent movement.
- Establish work procedures to eliminate creating openings through which persons may fall.
- SLAM; Stop, Look, Analyze and Manage the hazards associated with each work task.

Fall of Person Fatality

- On November 17, 2011, a 26 year-old contract underground miner with 3½ years of experience was seriously injured in a silver mine. He died at a hospital on November 19, 2011. The victim and a coworker were attempting to dislodge muck in a bin excavation when the muck they were standing on started to flow. The victim was wearing a safety harness attached to a self-retracting lanyard; however, the lanyard extended and did not lock before he became engulfed. The other miner was freed immediately, treated, and released from the hospital.


Location of
Hole in Bin

Best Practices

- Wear a safety harness and attach it to a securely anchored lanyard, where there is a danger of falling.
- In applications where the danger is not limited to a free-fall, do not use lanyards that depend on free-fall speed to lock. Follow the manufacturer's recommendations.
- Ensure that persons working on material in bins, silos, hoppers, tanks, and surge piles are properly tied-off, with one line tender per person.
- Ensure that persons are task-trained and understand the hazards associated with the work being performed and the proper use of their personal protective equipment.

Self Retracting Lanyard

- Self retracting lanyards work like some seat belts.
- They allow some movement, but when the movement is sudden the lanyard stops you.

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