1926 Construction Focus Four Caught In/Between Hazards

Objectives

By the end of the session, students will be able to:

- List the three main causes of caught in and caught between fatalities.
- Describe how to control hazards that cause caught in or caught between deaths.
- Describe safe equipment operation when there is a rollover hazard.
- Describe three key employer requirements that protect workers from caught in or caught between hazards

Caught In and Caught Between Fatalities

- Caught in and caught between deaths represented about 9.2% of construction fatalities in 2008.

- Have you or anyone you know been injured working in a trench?

- What happened?

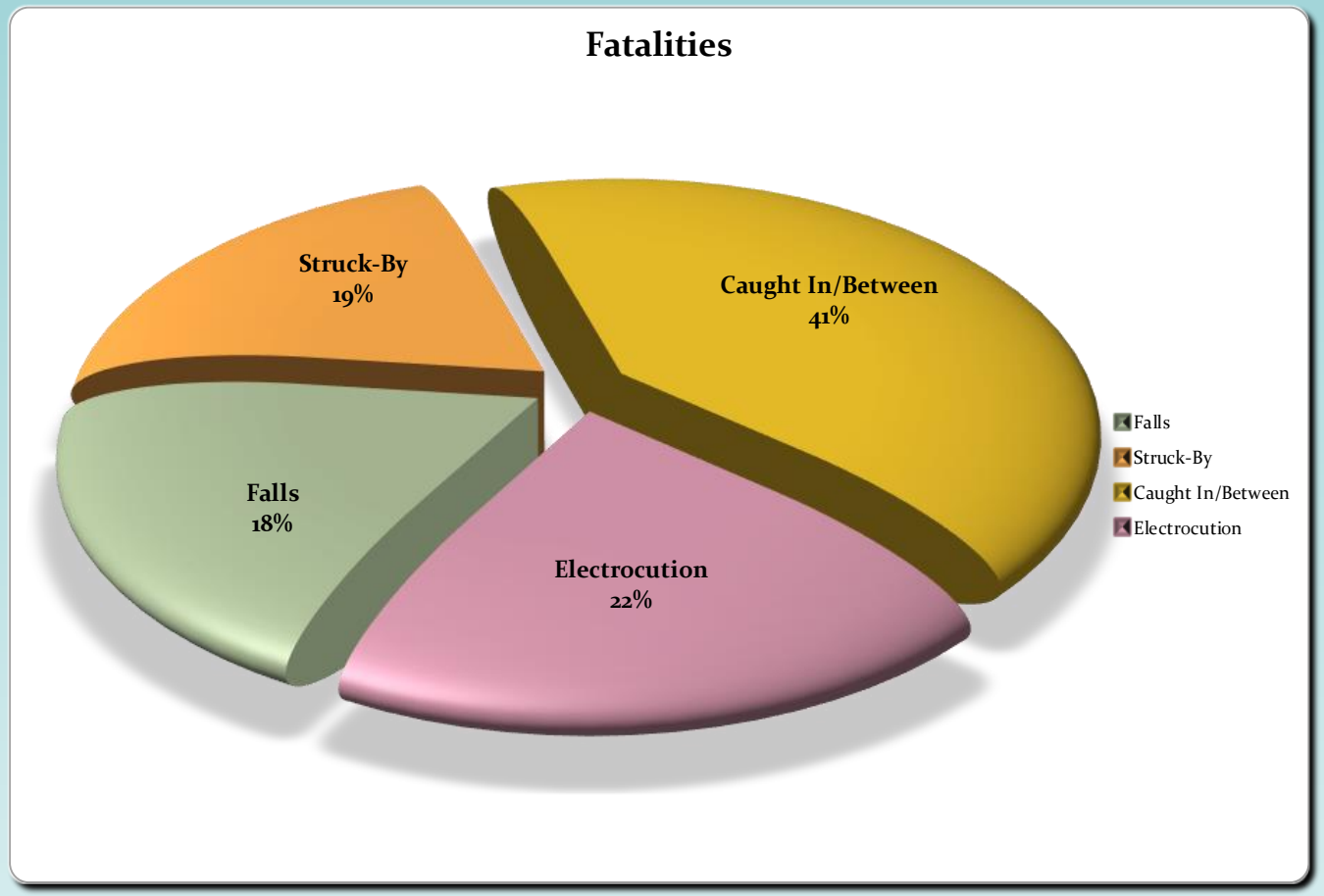
Caught In/Between Hazards

Focus Four

Elevator Industry-Related Caught In/Between Hazards

Fatality Type	Total
Falls	5
Struck-By	5
Caught In/Betwee	11
Electrocution	6
Total Fatalities	27

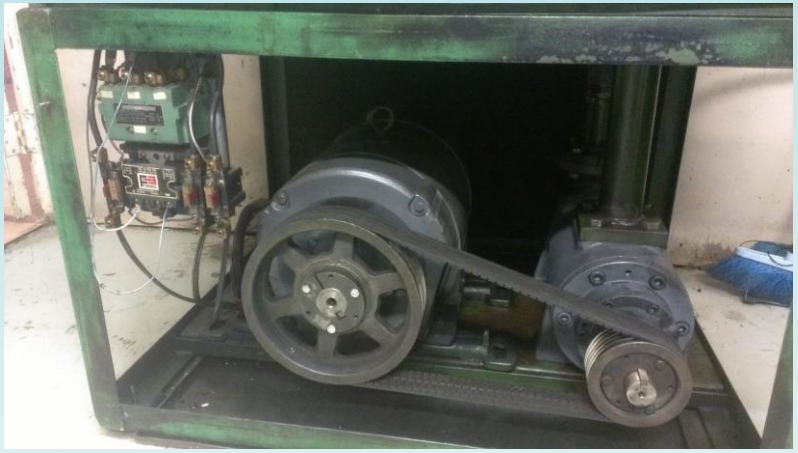
Since 2012, 41% of Elevator Constructor deaths have been caught in/ between related.



ON THE JOB FATALITIES BEGINNING--JANUARY 2012

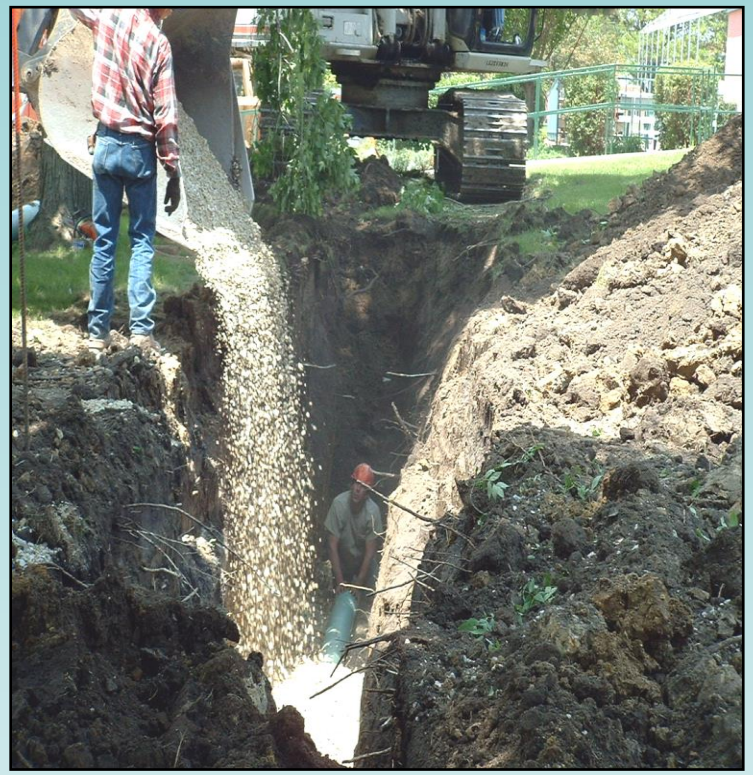
Types of caught in and caught between hazards

- Trench cave-in
- Moving parts of a machine, engine, or power tool
- Unguarded belts or pulleys
- Vehicle rollover



Trench Cave-ins

- Cave-ins happen suddenly with little or no warning; they are the greatest risk in trenches
- Most deaths from cave-ins occur in trenches 5 to 15 ft. deep
- Soil moves too fast to escape. It takes just over a half a second for a six-foot trench to collapse
- Human reaction time is a half a second; that leaves less than a second to escape

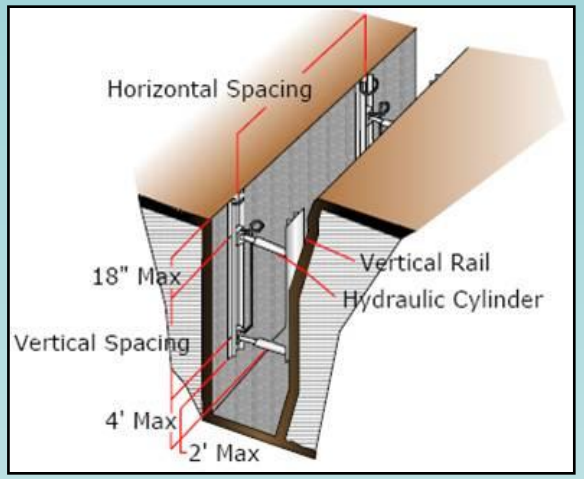


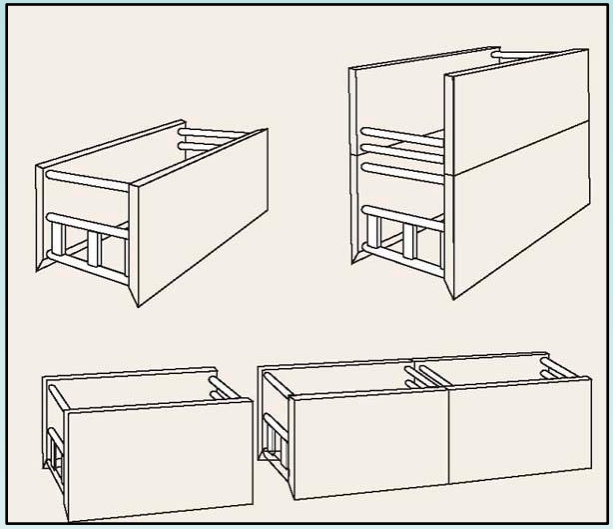
What Causes Trench Cave-ins?

- Unstable soil
- Excessive weight, such as machinery or a spoil pile that is close to the edge of the trench
- Water in trenches
- Vibration from vehicle traffic or equipment near the trench

What Must Employers Do to Make a Trench Safe?

- Train workers about trench hazards
- Designate a “competent” person before a trench digging starts
- Call before digging; all utilities must be marked
- The competent person identifies the soil type; the type of trench protection depends on the type of soil





Additional Employer Responsibilities

- Provide cave-in protection for trenches 5 feet or deeper, unless they are in solid rock
- The competent person must inspect the trench before each shift and OK workers to enter
- Provide a way of escape/egress, a ramp or ladder within 25’
- Equipment, like water pumps and ventilators, must be in good condition

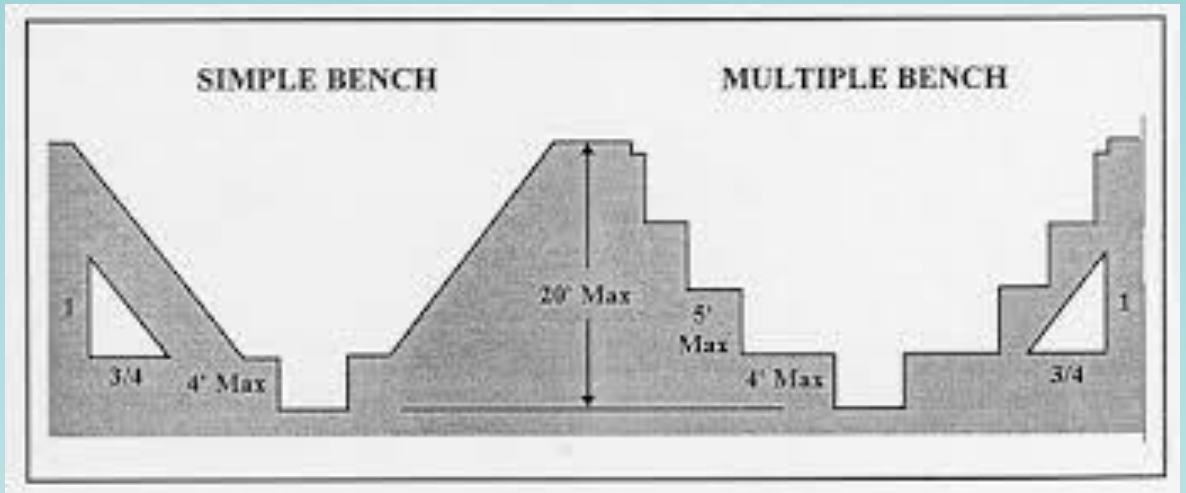
There are Four Methods to Support a Trench

- Sloping
- Benching
- Shoring
- Shielding

Sloping

Benching

Steps in trench wall



Shoring

- A support system made of posts, wales, struts, and sheeting
- Hydraulic shoring (shown here) is very common

Shielding

- A protective frame or box is used as a trench shield system

Excavation Rescue

Excavation rescue must be done carefully because rescue operations might:

- Cause additional cave-ins
- Create more soil pressure on buried victim
- Injure the victim more severely

The Weight of Soil Makes Breathing Impossible

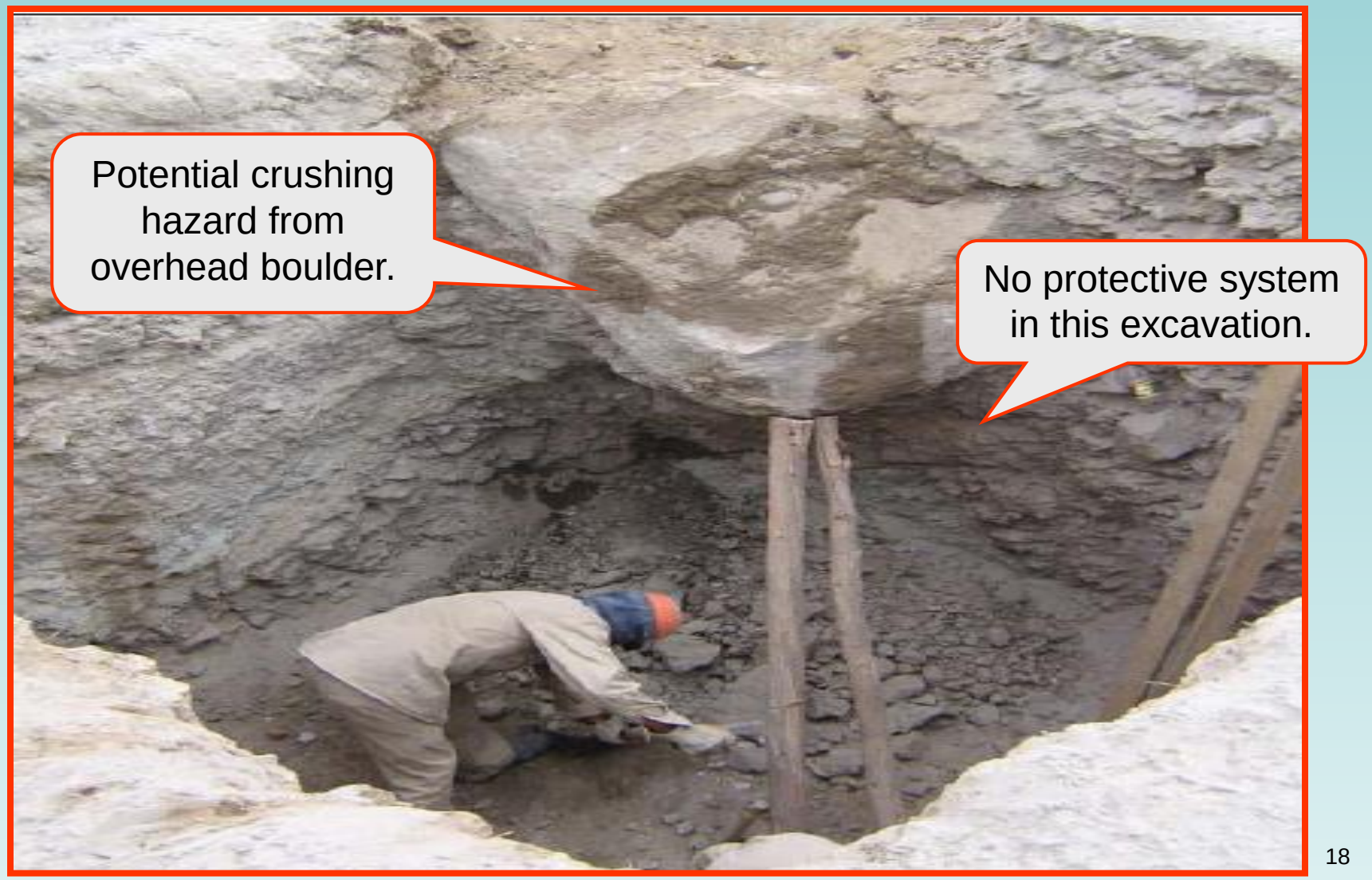
- Soil is made up of a variety of things such as sand, loam, and rock
- The amount of water in the soil also adds to the weight
- A cubic yard may weigh between 2,000 and 3,000 lbs.
- A person can't breathe buried in dirt

Recognize Any Hazard(s)?

Caught In/Between Hazards

Focus Four

YES



Caught In/Between Hazards

Focus Four

Recognize Any Hazard(s)?

Caught In/Between Hazards

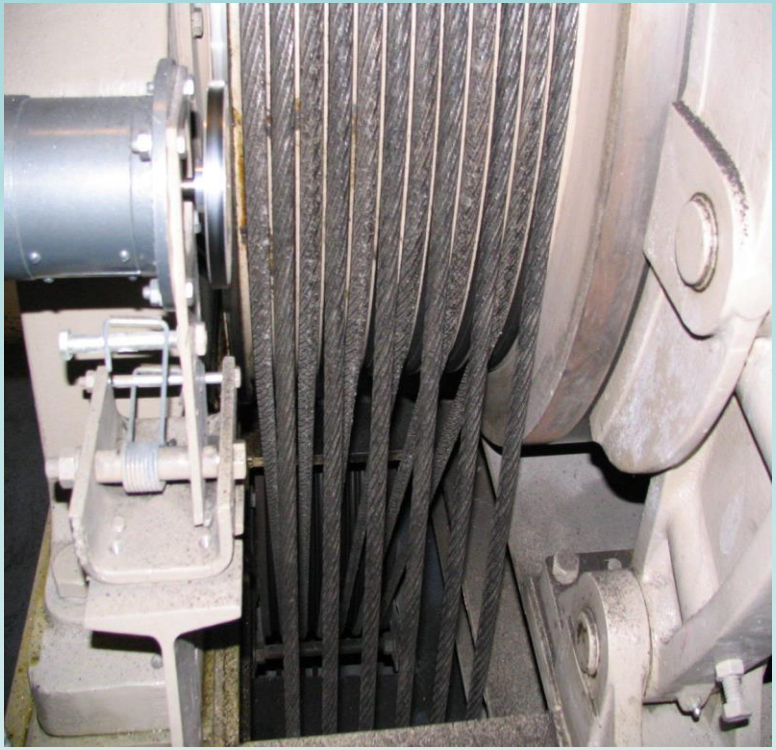
Focus Four

YES

What are some other caught in/ between hazards?

- Caught in machinery or mechanical equipment

- Vehicle Rollovers

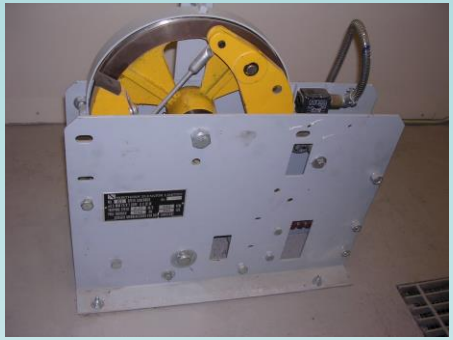


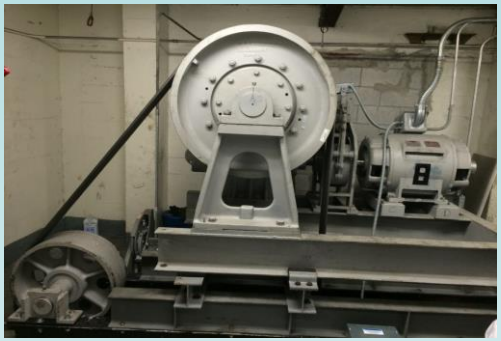
What Are Examples of Mechanical or Moving Equipment?

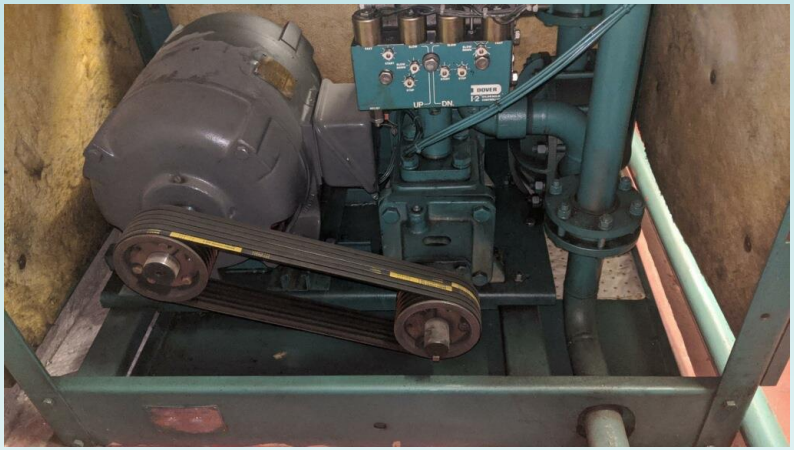
- Saws
- Presses
- Conveyors
- Bending, rolling, or shaping machines
- Powered hand tools
- Forklifts
- Personnel hoists

Machine room equipment

Rotating equipment can start without warning. Drive sheaves, governors, and pump motors all have the potential to cause serious injury. Be aware of your surroundings. Perform LOTO and control stored energy before servicing or repairing any equipment.







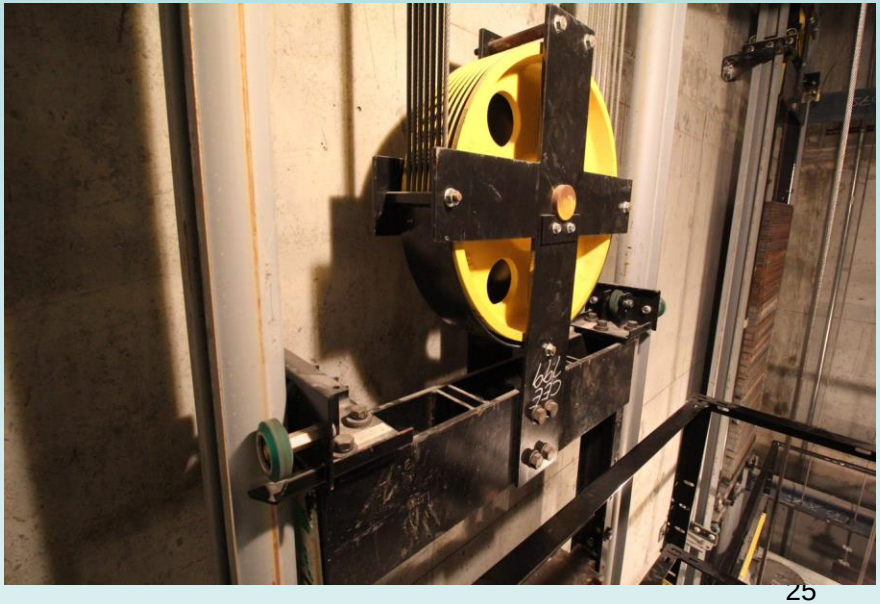
Machine room equipment cont.

Machine guarding is required by OSHA 1926.300(b). If you remove a guard while performing any work, replace it.

Counterweight

The counterweight runs in the opposite direction of the car and passes with only a few inches of clearance. The counterweight runs silent and appears without warning. Always be aware of the position of the counterweight when running on car top inspection.

Never stand on a divider beam in an active hoistway.



Recognize Any Hazard(s)?

Caught In/Between Hazards

Focus Four

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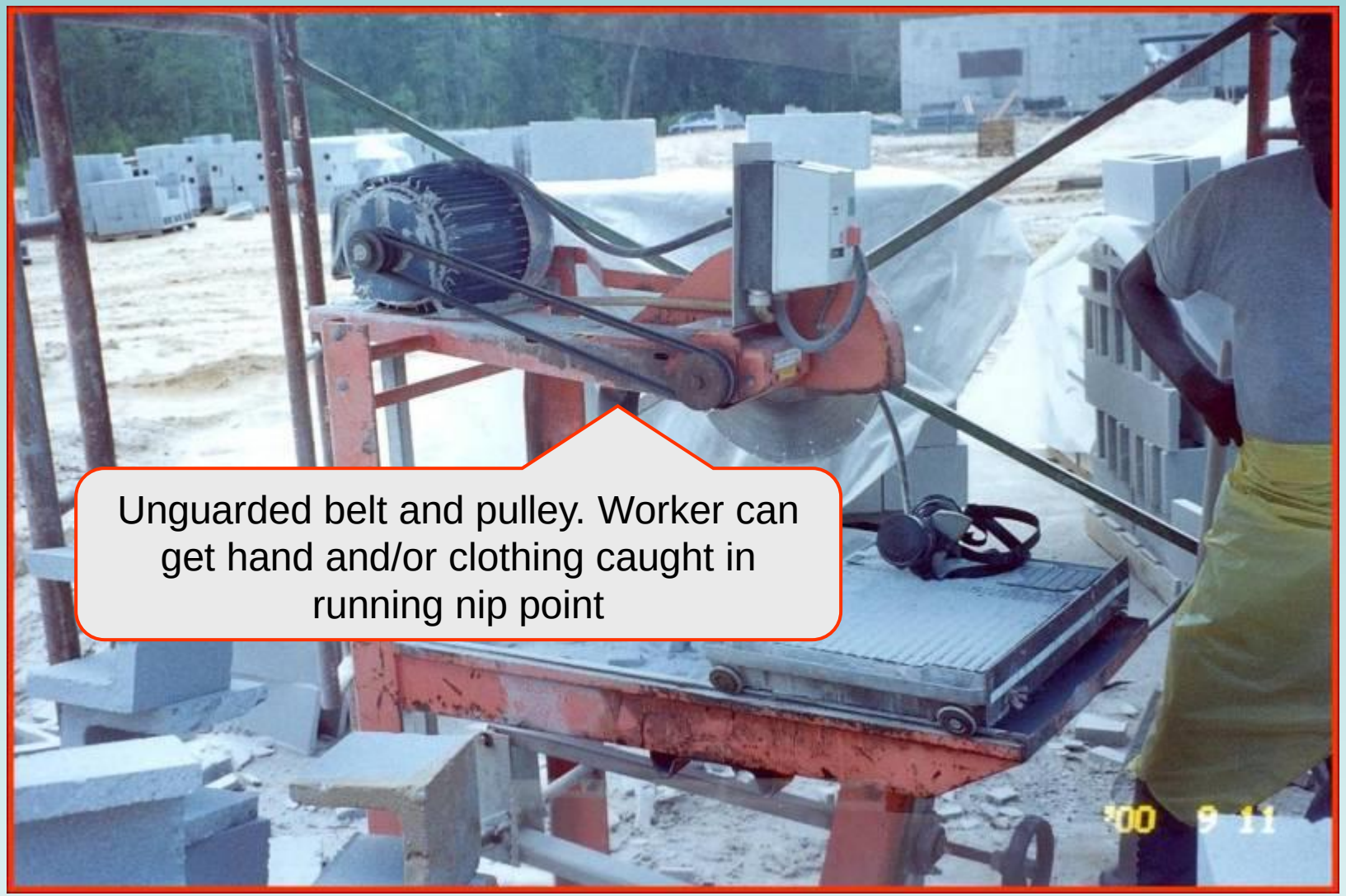


Close Call – Unintended Movement

Description of Incident

A repair crew was performing a 5-year load test on a swing-door hydraulic elevator, specifically, a pressure relief test.

The elevator was approximately 3 feet above the lowest landing, with 1,500 lbs. of test weight inside. The car calls were somewhat accessible, on the right side looking in.

The pit ball valve was shut off. The power was on and the pit switch was in the run position. The Apprentice was at the elevator.

The TM was in the machine room located approximately 150' from the elevator. Both had constant, direct communication via cell phone.

The Apprentice placed an upper floor car call and held a jumper device in the swing door interlock. The TM was awaiting pump motor actuation to capture relief pressure.

When no pump actuation was initiated, it was decided they needed to move the elevator to reset the test.

Close Call – Unintended Movement

Description of Incident, cont.

The Apprentice removed the jumper device from the interlock, and laid down across the first floor sill with his torso inside the hoistway.

He reached down into the pit and cracked the pit valve, not expecting the car to move.

The elevator began to descend, and the Apprentice immediately closed the valve. The elevator pinned him to the hoistway sill between the toe guard.

The TM heard the control valve release and the Apprentice grunting and struggling. The Mechanic deenergized the main line disconnect and ran to the elevator.

Upon reaching the elevator, the Apprentice had managed to maneuver himself to relieve some of the pressure on his chest.

The TM proceeded to free the Apprentice by removing the toe guard and took him to the ER. Miraculously, the Apprentice sustained no injuries.

Caught In/Between Hazards

Focus Four

Pit

Always follow your company safety procedures for entering a pit. Be aware of car position when accessing the pit. There are many pinch points to be cautious of, such as between the toe guard and hoistway sill, between the car and pit ladder, or around the counterweight. Counterweight guards should be installed as soon as the counterweight is installed.

Pit cont.

Working Under a Hydraulic Elevator

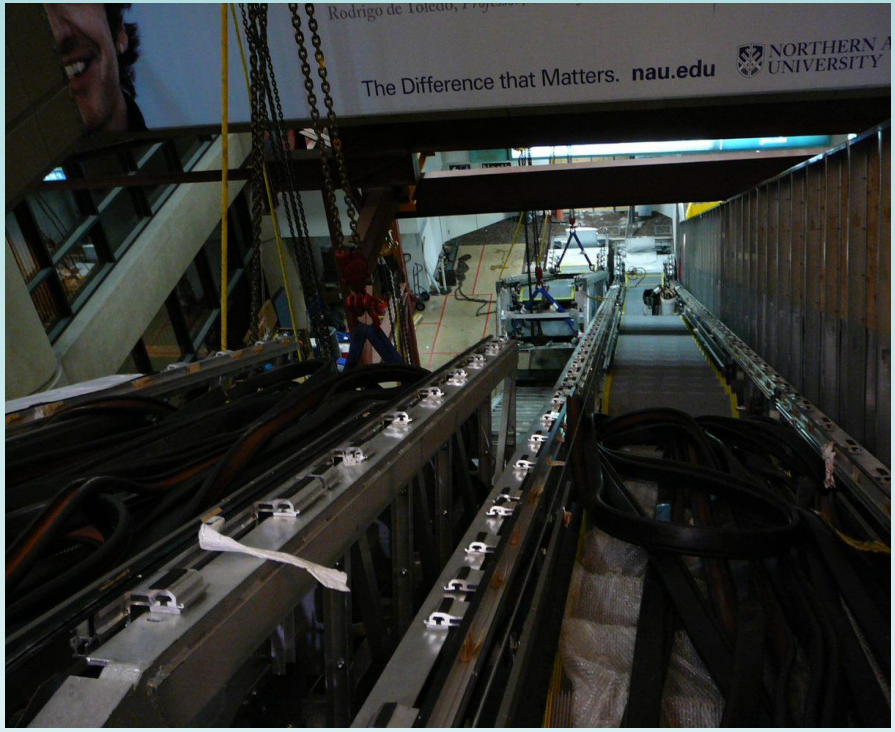
Hydraulic elevators are supported by a column of oil. Before entering the pit, secure the elevator car from unintended movement and perform LOTO according to your company safety policy. In this picture, stored energy is controlled by landing the car on pipe stands and performing LOTO. Rail blocks are used as a safety backup for the pipe stands.

Caught In/Between Hazards

Focus Four

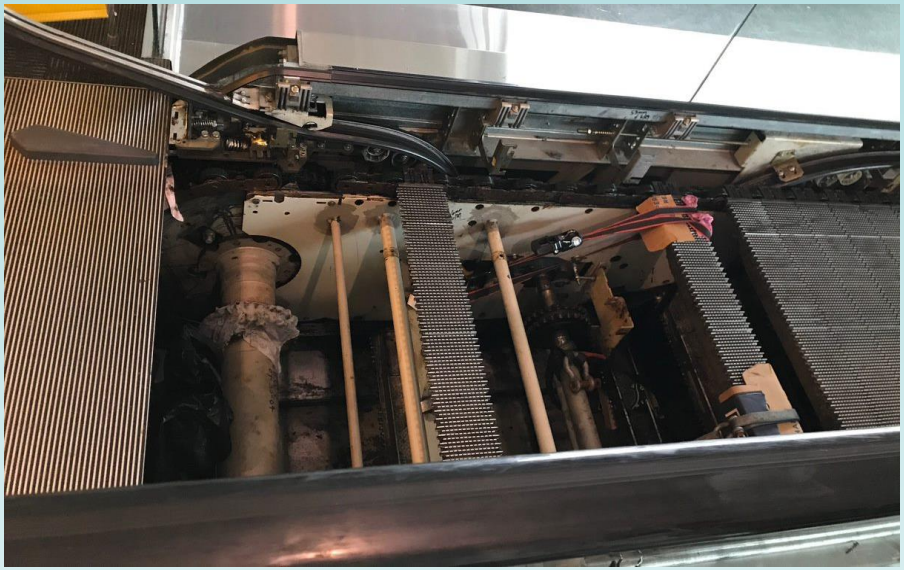
Escalators and Moving Walks

During hoisting operations, be aware of pinch points. Loads sometimes shift quickly and without notice. Units that deliver with some steps/ pallets removed can create an unbalanced load on the system.



Escalators and Moving Walks

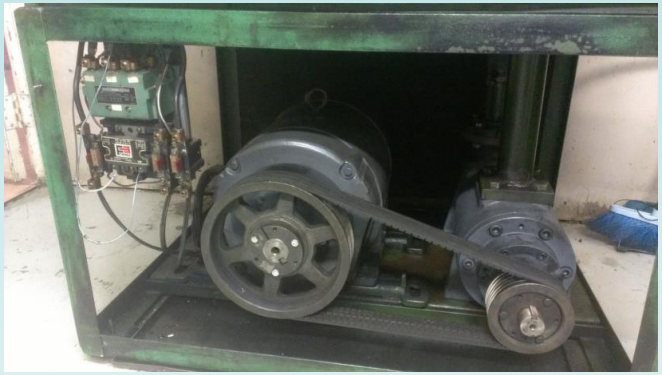
Never enter the step or tread band without performing LOTO and mechanically securing the unit from stored energy or unintended movement.



Unloading Equipment

When unloading equipment, remember that loads can shift. Never place yourself where a shifting load can pin you.

How Can Workers Be Protected From Moving Parts or Equipment?



Machine Guards

Employer training in safe use of equipment*

Lockout/Tagout

OSHA says that employers should:

- Set up a written lockout/ tagout program to make sure equipment is disconnected and locked before it is repaired.

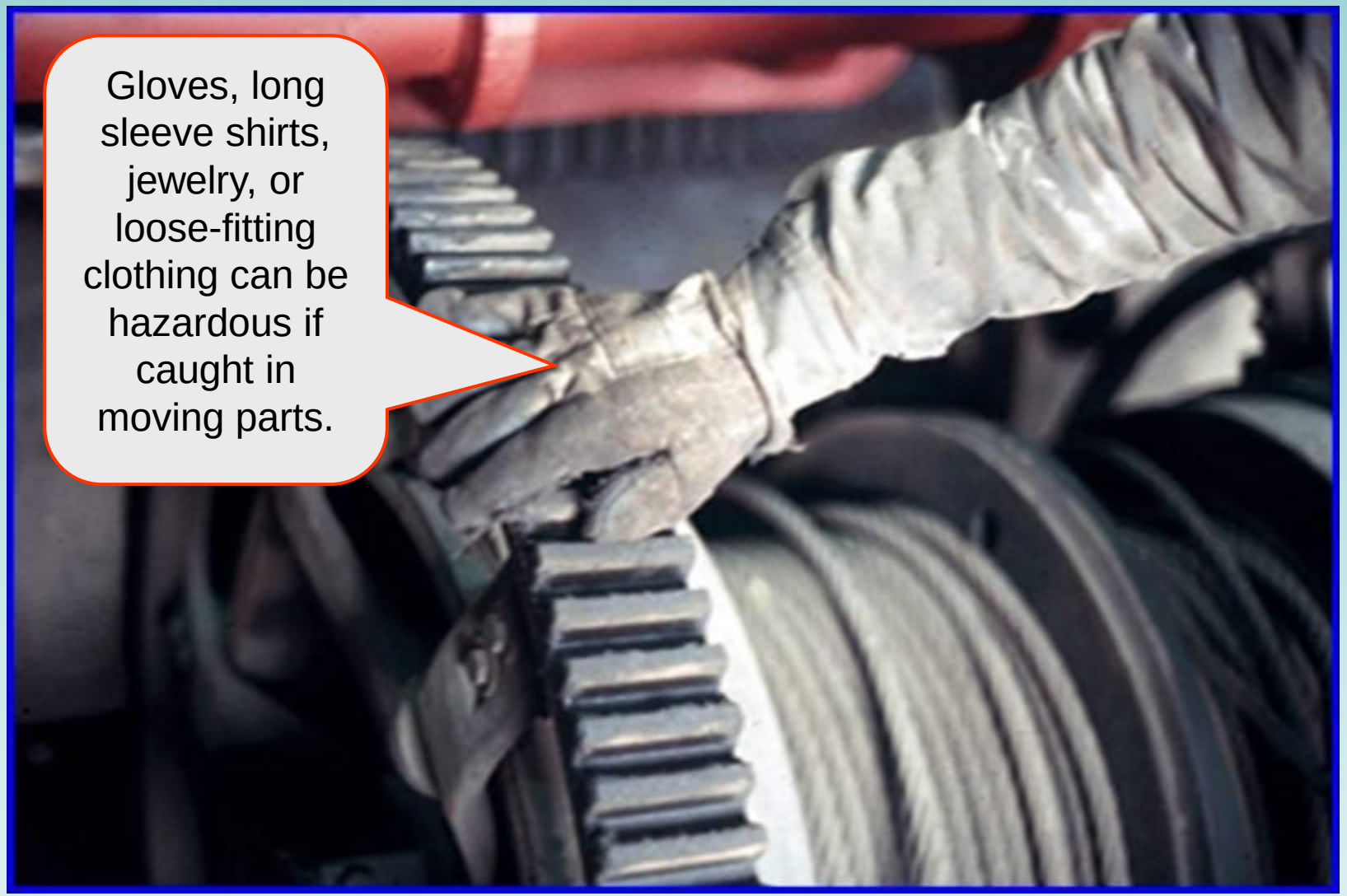
- Train you to use the program.

Recognize Any Hazard(s)?

Caught In/Between Hazards

Focus Four

YES



Vehicle Rollovers

Always keep vehicle on stable ground and be aware of terrain transitions.

Session Review:

- List three main causes of caught in and caught between fatalities.
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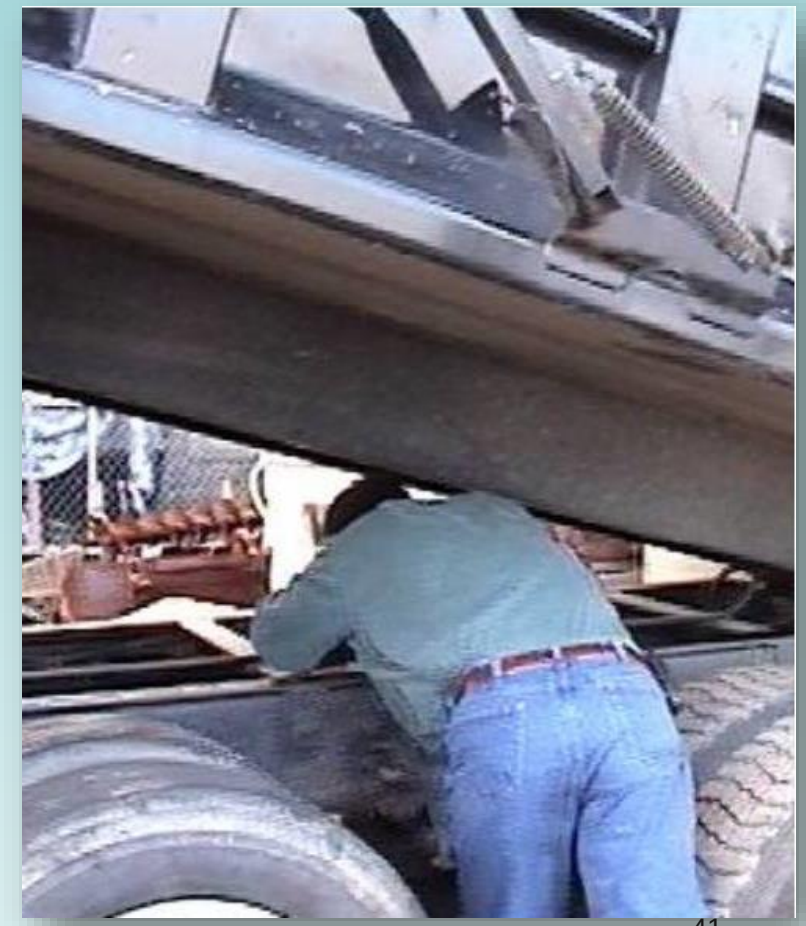


Caught In and Caught Between Hazards Summary

- Trench protection is required for 5 ft. deep or more
  Methods of trench protection:
  - sloping, benching, shoring, shielding
- Trench inspections must be conducted by a competent person
- Only those who are trained and equipped should perform trench rescues
- Use lockout/tagout procedures when servicing or repairing machines
- Use heavy equipment that has a ROPS, and fasten the seatbelt.

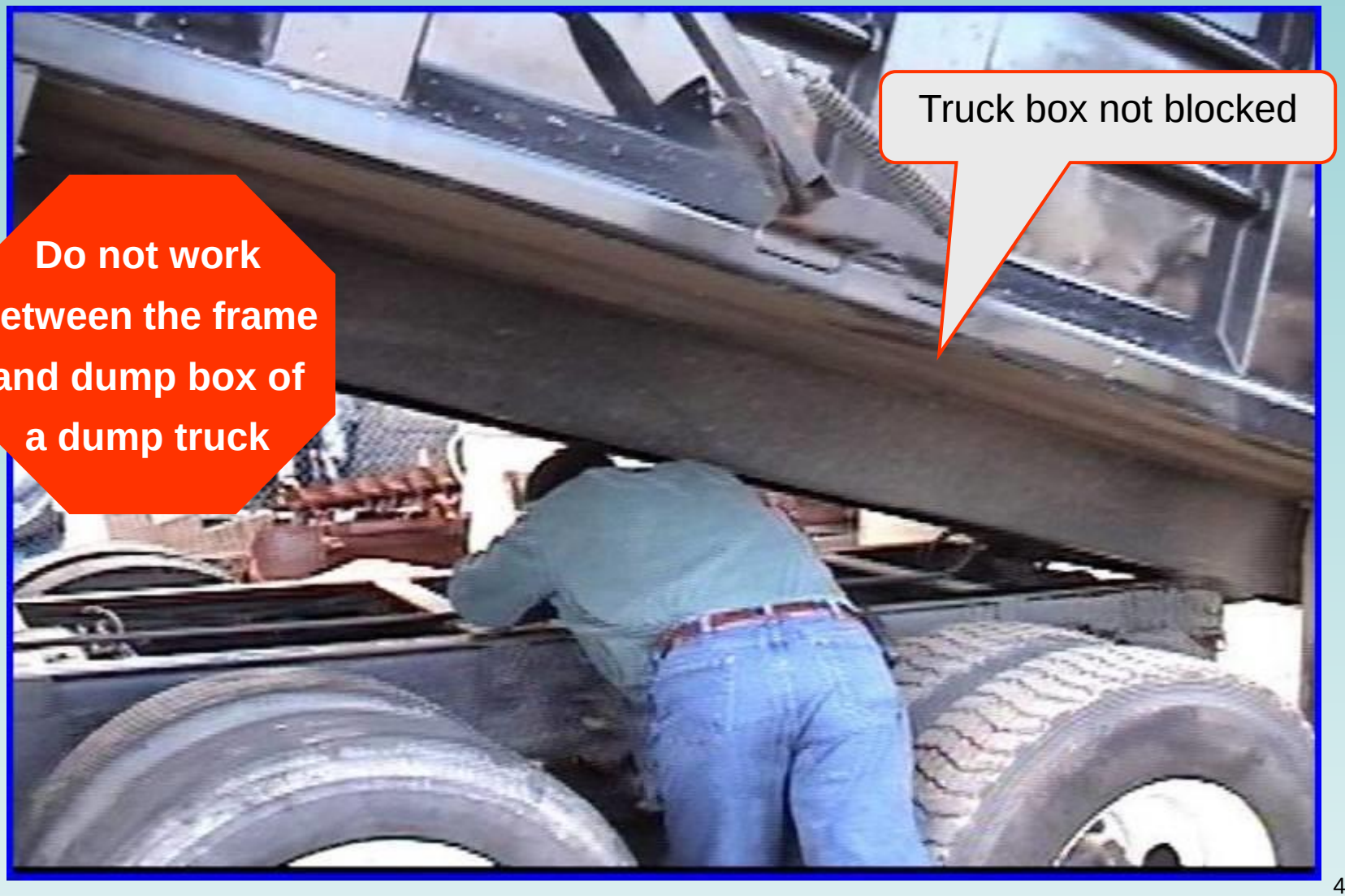
Recognize Any Hazard(s)?

Source: Indian River Community (now State) College

Caught In/Between Hazards

Focus Four

YES



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Recognize Any Hazard(s)?

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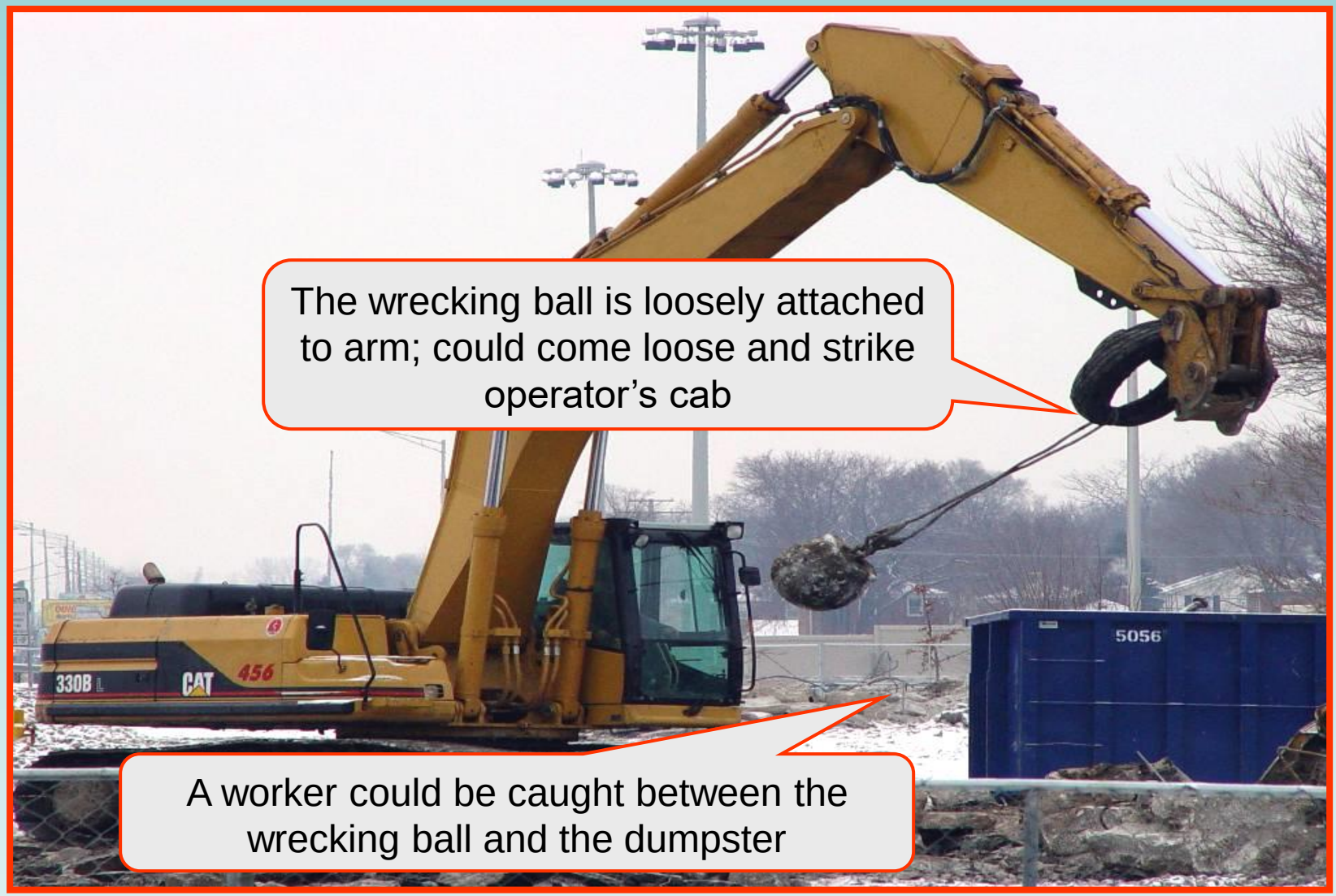

Caught In/Between Hazards

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Through the Alliance between OSHA's 10 Regional Offices and the Elevator Contractors of America (ECA), Elevator Industry Work Preservation Fund (EIWPF), International Union of Elevator Constructors (IUEC), National Association of Elevator Contractors (NAEC), National Elevator Industry Educational Program (NEIEP), and National Elevator Industry Inc. (NEII), collectively known as The Elevator Industry Safety Partners, developed this Caught In/Between Hazards Industry Specific Training for informational purposes only. It does not necessarily reflect the official views of OSHA or the U.S. Department of Labor. May 2021

Under the Occupational Safety and Health Act, employers are responsible (http://www.osha.gov/as/opa/worker/employer-responsibility.html) for providing a safe and healthy workplace and workers have rights (https://www.osha.gov/workers). OSHA can help answer questions or concerns from employers and workers. OSHA's On-Site Consultation Program (https://www.osha.gov/consultation) offers free and confidential advice to small and medium-sized businesses, with priority given to high-hazard worksites. For more information, contact your regional or area OSHA office (https://www.osha.gov/contactus/bystate), call 1-800-321-OSHA (6742), or visit https://www.osha.gov/.

Caught In/Between Hazards

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