

ARE YOU IN THE "LINE OF FIRE?"

Crushing Hazards and Energy Isolation
Activity Package



SETTING THE STANDARD IN OIL AND GAS SAFETY

ENERGY
SAFETY
CANADA



CRUSHING HAZARDS – ARE YOU IN THE “LINE OF FIRE?” INJURY REDUCTION CAMPAIGN

You “Are in the Line of Fire” when you are at risk of coming into contact with a force your body cannot endure.

Crushing hazard awareness is:



Stored Energy

Contact with stored energy
Includes pressure releases



Striking Hazards

Struck by or striking against an object
Includes dropped objects



Crushing Hazards

Caught in, on or between an object
Includes hand injuries



LINE OF FIRE - LIFE SAVING RULE

This overview includes materials in relation to the Line of Fire Life Saving Rule as well as materials that are not part of the Life Saving Rule. The Life Saving Rule focuses on body positioning.

This rule indicates:

Keep yourself and others out of the line of fire

- I position myself to avoid:
 - Moving objects
 - Vehicles
 - Pressure releases
 - Dropped objects
- I establish and obey barriers and exclusion zones
- I take action to secure loose objects and report potential dropped objects





ENERGY ISOLATION - LIFE SAVING RULE

Crushing hazards are also strongly relevant to the Energy Isolation Life Saving Rule.

This rule indicates:

Verify isolation and zero energy before work begins

- I have identified all energy sources
- I confirm that hazardous energy sources have been isolated, locked, and tagged
- I have checked there is zero energy and tested for residual or stored energy





OTHER RELATED LIFE SAVING RULES



FIT FOR DUTY



HOT WORK



**BYPASSING
SAFETY
CONTROLS**



**CONFINED
SPACE**



CRUSHING HAZARDS

What is a Crushing Hazard?

- Crushing hazards that cause injuries when body parts get caught in, on or between objects. These hazards are also referred to as “pinch points”.
- The physical forces applied to a body part caught in a pinch point can cause injuries ranging from bruises and cuts to amputated body parts and even death.





EXAMPLE OF A CRUSHING INJURY

Add your company example here:



INDUSTRY TOP CAUSES OF CRUSH INJURIES

Safety alerts and incident reports show these recurring causes continue to result in crush injuries:

1. **Human factors** - body positioning, fit for duty, operator error.
2. **Complacency** - risk has been normalized.
3. **Insufficient competency** - understanding and demonstration of energy isolation, otherwise known as (LOTO).
4. **Inadequate risk assessment** - failure to identify hazardous energy.
5. **Inadequate procedures** - poor planning, no management of change and procedures do not take into consideration various operating conditions such as during maintenance or an upset.
6. **Poor design and installation**- human factors have not be incorporated into design risk assessments such as Hazops.
7. **Poor housekeeping** - pre-existing hazards from previous tasks.
8. **Inadequate inspection, repair and maintenance** - ignoring unsafe conditions.
9. **Environmental factors** - wind, sea motion, ice, snow, and extreme conditions.



PREVENTION

Everyone has a responsibility to prevent crush injuries through:

- **Observation and intervention** - being aware of the hazard, associated risks, and prepared to stop work if conditions or actions are unsafe.
- **Reporting** - recording all potential and actual incidents in accordance with company policy.
- **Control** - know and follow your LOTO program (Operational Discipline).
- **Design and procurement** - design equipment so it has capacity to handle a worker error without a catastrophic incident as an outcome, such as with the use of interlocks.
- **Inspection** - regular and periodic work site inspections of all high-risk items, particularly during LOTO.



CRUSHING HAZARDS

How can you protect yourself?

- Give your work your full attention, most accidents occur when workers are distracted. Are you physically and mentally in a state to perform your assigned duties?
- Plan your actions and determine the necessary steps to work safely.
- Look for possible pinch points before you start a task.
- Read and follow warning signs posted on equipment.



FIT FOR DUTY



CRUSHING HAZARDS

How can you protect yourself?

- Never reach into a moving machine.
- Properly maintain and always use safeguards and guarding provided with your equipment; they act as a barrier between the moving parts and your body.
- Do not reach around, under or through a guard and always report missing or broken barriers to your supervisor.
- Turn equipment off and use lock-out/tag-out procedures before adjusting, clearing a jam, repairing, or servicing a machine.





CRUSHING HAZARDS

How can you protect yourself?

- Dress appropriately.
- Wear pants and sleeves that are not too long or too loose. Shirts should be fitted or tucked in.
- Tie back long hair and tuck braids and ponytails behind you or into your clothing. Wear appropriate, well-fitting gloves for your task.
- Do not wear any kind of jewelry.





CRUSHING HAZARDS

How can you protect yourself?

- Never place your body under or between powered equipment unless it is de-energized, tested, and locked-out.
- Vehicles, powered doors, and forklifts can pose a crush hazard unless they have been blocked or isolated.
- Ensure you have established communication protocols and understanding of the right of way rules for the movement of large equipment such as mine haulage vehicles, rigs, rail cars, etc.





CRUSHING DISCUSSION

Discuss the following as a group:

- What are the situations when we cannot or choose not to isolate hazardous energy?
 - In these situations how are we managing the risks and is it enough?
- Are the procedures on energy isolation followable?
- Where could a serious crushing incident occur on our work site?



WHAT CAN EACH OF US DO?

- Ensure hazardous energy has been isolated (LOTO)

REMEMBER

Hazardous energy is what crushes you.



Don't get yourself in a pinch!

Let's work together and prevent crushing injuries.