ARE YOU IN THE "LINE OF FIRE?"

Dropped Objects Activity Package
You are in the line of fire when you are at risk of coming into contact with a force your body cannot endure.

Dropped object 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 that relate to the Line of Fire Life Saving Rule and some that do not. 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
RELATED LIFE SAVING RULES

FIT FOR DUTY
WORKING AT HEIGHT
BYPASSING SAFETY CONTROLS
SAFE MECHANICAL LIFTING
WHAT IS A DROPPED OBJECT?

Any object with the potential to cause death, injury, equipment or environmental damage that falls from its previous static position, either under its own weight, or as a result of applied energy.

When referring to dropped objects, we need to consider:

• Operations conducted at height.
• Hand tools being used at heights.
• Equipment mounted at a height that, following contact, vibration or environmental conditions could fall, e.g. piping, lights, cameras, rigging gear etc.
• Snow, ice, dirt and rocks.
• Personnel working on or directly below an elevated work site.
• Lifting operations.
DID YOU KNOW?

Dropped objects is one of the top categories of potentially serious incidents (PSI) in the oil and gas industry.

A PSI is any event where a reasonable and informed person would determine that under slightly different circumstances, there would be a high likelihood for serious injury to a person.*

Drops objects prevention is about safe behaviors and safe conditions:

- Safe behaviours means your personal actions, such as following the Life Saving Rules.
- Safe conditions relates to assets and managing those assets and any risks.

*ESC PSI Guideline
EXAMPLE

Insert your company example here:
EXCLUSION ZONES – NO-GO ZONES

Establishing and adhering to exclusion zones is critical for managing line of fire in relation to dropped objects. For more information see the Best Practice from DropsOnline.org.
The Dropped Object Calculator* provides a common benchmark in the classification of the potential consequences of a dropped object.

A simple rule of thumb for potential dropped objects is:

The heavier the object, the more severe the consequences, the further it falls, the more severe the consequences.

*https://www.dropsonline.org/resources-and-guidance/drops-calculator/e-drops-calculator/
Your hard hat is designed to withstand 95 joules of energy. If a 9 kg wrench is dropped 2 m (6 ft) before it hits a worker’s hard hat, how serious an injury could we expect?

That is 176 joules of energy.

Enough energy to kill you, even with a hard hat!
TOP CAUSES OF DROPPED OBJECTS

Safety alerts and incident reports show these recurring causes continue to result in dropped objects:

1. Inadequate risk assessment - failure to identify dropped object hazards.
2. Inadequately stored or secured tools and equipment - no lanyards or tethers being used.
3. Inadequate procedures - bad planning and no management of change.
4. Failed fixtures and fittings - corrosion, vibration, poor design, and selection or improper installation.
5. Poor housekeeping - pre-existing hazards from previous tasks.
7. Human factors - body positioning, fit for duty, operator error.
8. Collisions and snagging - lifting, travelling equipment, tag lines, and service loops.
9. Inadequate inspection, repair and maintenance - ignoring unsafe conditions.
10. Redundant, neglected and homemade tools and equipment - should be eliminated.
PREVENTION

Everyone has a responsibility to prevent dropped objects 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.
- **Elimination** - the removal of potential dropped object hazards if it is safe to do so, ensuring all loose items are cleared from the work site before and after each task.
- **Control** - ensuring all items of structure, equipment, and tools are securely fastened or tied off, especially when using tools and equipment at height.
- **Design and procurement** - informed selection and availability of tools, materials and resources.
- **Inspection** - regular and periodic work site inspections of all high-risk items, particularly loads prior to lifting or transportation.
SOME SITUATIONS TO THINK ABOUT

How secure are overhead items such as:

- Light fixtures
- Rigging equipment, like sheaves
- Items on storage racks
- Snow, ice, dirt and rocks
- Workers using hand tools
- Workers handling, removing or installing equipment
- Items in your pockets or PPE (gas detector, etc.) when working above others?

Has an exclusion zone or no-go zone been established and is it adhered to?
Use tethers and container equipment designed to stop a drop, such as equipment in conformance with the American National Standards for Dropped Object Prevention Solutions (ANSI 121-2018).

This standard covers the following:

- Anchor attachments
- Tool attachments
- Tool tethers
- Containers

Information on this standard can be found at ANSI.

DropsOnline.org has excellent guideline on the safe use of tools and equipment at height.

This guide covers a variety of topics such as:

- Lanyard and attachment points
- Tool attachments
- Power tools
- Tool storage

This guide can be found at DropsOnline.org.
Astronauts must prevent dropped objects. A dropped object becomes a satellite that can be moving 28,000 km/hr. Regardless of mass, an object moving at that speed can damage or kill. Discuss as a group the challenges that an astronaut would face in preventing dropped objects.
WHERE COULD DROPPED OBJECTS IMPACT YOU?

Think of your work and discuss the following questions as a group:

- Look up, what is above you and how confident are you that it can’t fall?
- Have exclusion zones been established and are they adequate?
- Do we need to better plan our work to avoid line of fire in relation to simultaneous operations?
- Do you have access to equipment tethers and lanyards?
- Do you understand how to select, inspect and use equipment tethers and lanyards?
WHAT CAN EACH OF US DO?

• Free falling objects are in a state of acceleration.
• The kinetic energy gained by a dropped object is transferred to its target.

REMEMBER

can turn into this. . . .

this...

Let’s work together and. . . .

eliminate dropped objects!