

What is Line of Fire ?

SAFETY CONTACT / SAFETY PAUSE

LINE OF FIRE

“**Line-of-fire**” is a military term that describes the path of gunfire or a missile. However, in Industry, **Line of Fire** refers to workers who put themselves in harm’s way by standing in the wrong place at the wrong time and then coming in contact with some form of energy.

Or

Simple definition of “**line of fire**” is being in harm’s way. Line of fire injuries occur when the path of a moving object or the release of hazardous energy intersects with an individual’s body.

Global incident statistics show that **approximately 27% of workplace injuries** are related to Line-of-fire incidents. This greatly drives us to proactively embrace the responsibility of making ourselves and other employees out from the Line of Fire safety by following Safe work practices.

LINE OF FIRE SAFETY HAZARD

Line of Fire is being in harm's way. Injuries occur when the path of a moving object or the release of hazardous energy interacts with an individual's body.

Three major categories of line of fire incidents with examples



Caught-in/Between objects

Examples include:

- Worker placing his hand too close to a rotating gear and gets pulled into the gear
- Worker caught in between two moving pistons



Struck-by including dropped objects

Examples include:

- Worker hit by suspended weight
- An object falling from a higher level striking a worker below



Released energy

Examples include:

- A pipe releasing hot steam from a valve that is being removed
- Electrical shock from working on energised equipment



Caught-in/between Hazards: Injuries resulting from a person being squeezed, caught, entangled, crushed, pinched, or compressed between two or more objects, or between parts of an object/unguarded machinery or equipment.

Equipment specific

- Use equipment only when all guards are in position and properly adjusted
- Ensure all rotating/moving parts are properly guarded
- Realise risks of getting caught in machinery by belts, pulleys, gears, rotating shafts/moving parts

Maintain distance

- Stay away from equipment, you are not operating
- Stay out of swing radius of equipment
- First make eye contact with operator and use unobstructed signals to approach energised equipment

RECOGNISE - PROTECT - PREVENT



Identify & control all 'Line of Fire' hazards in business operations

Save yourself from **Caught-in/between Hazards**

Ground Excavation

- Ensure adequate safety controls are in place to reduce the risk of "cave ins".
- For more info refer to related ABG Guidance Note (**ABG/SUST/GN/30**)

Respect barricades

- Barricade areas unsafe for pedestrian traffic
- Establish boundary control to prevent interactions with rotating and moving equipment.
- Avoid walking within demarcated areas

Monitor material movement

- Do not position yourself between a moving load and wall or fixed equipment
- Always work at a safe distance from the load and do not come between load and its final resting place

Struck-by Hazard: Refers to an accident in which a person is hit and injured by an object, tool or equipment. They are mostly related to improper material and equipment handling and poor housekeeping.

Sources

- Accidental hits by cranes, heavy equipment, vehicles and loader trucks
- Falling, flying, slipping, rolling and swinging equipment and materials
- Poorly stacked heavy materials that may fall, slip and slide
- Poor housekeeping, such as a tools or equipment left on edges or shelves
- Objects leaning against walls or posts
- Unmarked low beams or pipes at site
- No screen guard at site for objects flying off
- Unusual work such as demolition of buildings, tree trimming, pruning and felling etc.



Always survey your surroundings for **'Struck-by Hazard'** and stay clear of **Line of Fire!**

Prevention

- Follow safety instructions and safe work procedures
- Maintaining good housekeeping – appropriate stacking and piling of materials
- Arrange nets to prevent or catch falling secure tools and equipment with lanyards to prevent from falling
- Identify and restrict entry to areas with potential for struck by hazard i.e. – Load handling by EOT Cranes, Forklifts & vehicle movement operation, dropped object from scaffolding etc.
- Safety observations and audits
- Use of appropriate PPE (Personal Protective Equipment)
- Administrative control for visitors - Notices and Signs

ARE YOU IN THE LINE OF FIRE?



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THINK about TOMORROW,
TODAY!

When *Stored Energy is released* it can cause serious or fatal harm to those in its path.

Instances of Line of Fire - Stored Energy

GRAVITATIONAL



- Working next to material stored at height on shelves
- Involved in cutting, trimming branches and trees
- Demolition activity - cutting metal sheets of smelter buckets
- Working below ongoing construction of roofs

HYDRAULIC



- Working around worn or damaged hose and piping
- Maintenance work on hydraulic cylinders
- Operating power presses and moulding machines

CHEMICAL



- Opening thief hatches on production storage tanks with hazardous chemicals
- Filling hazardous chemicals in containers like Chlorine Tonners
- Opening valves to collect chemical samples

ELECTRICAL



- Working on equipment that has not been de-energised
- Standing on equipment during a lightning storm
- Standing directly in front of a panel when activating a breaker

PNEUMATIC



- Opening valves or fittings to release pressured gas such as air, nitrogen, steam or natural gas

MECHANICAL



- Working near or on moving conveyor belts, rotating equipment or open gears
- Standing in front of a moving equipment or vehicles

RADIATION



- Working down line of non-destructive x-ray testing

ASK YOURSELF

Am I putting myself or others in the line of fire while I complete this work?

THERMAL



- Standing at the end of a pipe that is being steamed
- Disconnecting thermal piping
- Using inspection windows for furnaces

Don't Put Yourself in Harm's Way

ARE YOU IN THE LINE OF FIRE?



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THINK about TOMORROW.
TODAY!

Hazardous Energy Control

Use design, techniques and methods to keep adequate protection from unintended release or exposure to stored energy from machinery, equipment or processes

Control at source

1. Isolate, block or dissipate all identified hazardous energy sources to ensure it cannot be overridden or by-passed. Ensure 100% de-energising
2. Secure all point(s) of control to prevent unauthorised persons from re-energising machine, process, or systems
 - Secure by physical means – **Lockout**
 - Post a warning – **Tagout**
 - Post qualified personnel to guard
3. Verify that all personnel are clear of all points of danger before re-energising machine, process or system



Pneumatic



Hydraulic



Mechanical



Thermal

Am I putting myself or others in the line of fire of Hazardous Energy?



Electrical



Chemical



Gravitational



Radiation

Control with energy present

1. Identify all hazardous energy sources, including residual energy sources
2. Use engineering controls and design to prevent exposure to hazardous energy. i.e. Machine guards and Safeguards
3. Use administrative controls e.g. **Permit to Work (PTW)**. Assign responsibility and accountability
4. Ensure competent personnel to perform the maintenance work

Don't Put Yourself in Harm's Way

ARE YOU IN THE LINE OF FIRE?



Steer Clear from Line of Fire (LOF) Incidents

Best is to **eliminate the related hazards** for each category of LOF incidents

When elimination is not possible, establish **engineering controls** e.g. physical barriers, machine guarding etc.

And always have **administrative controls** of defence: **PTW, LOTO, Line break procedures** & wearing appropriate **PPEs**

Crucial Steps

- Be aware of all the hazards around you including LOF
- Understand the machines and operations in your work area where hazardous stored energy is present
- Take time to think about the consequences that could result from your actions

Struck-by including dropped objects



Caught -in/between objects



Released energy



Managers Must

- Assess work situations where a LOF may be present, and implement controls to minimise the risk
- Seek engineering support for situations that cannot be effectively mitigated (i.e. equipment design and human factor)
- Consider both LOF and human factors in design reviews, HAZOP etc.

Don't Put Yourself in Harm's Way



Line of Fire



Examples of Being In The Line of Fire

01

In the path of moving equipment.



03

Working next to unstable materials that could shift.



05

Placing hands or body in equipment that can rotate.



02

Underneath lifted load or static objects that could fall.



04

Working next to objects under tension.



Line of Fire is the path an object will travel and create a risk of injury. You are in the line of fire when you are at risk of coming into contact with a force that will, or may hurt you



Remember, *nothing that we do is so urgent that we cannot take time to do it safely. What you don't know can hurt you and what you knew can help you.*

Approximately 27% of work place deaths are related to Line of Fire accidents



LINE OF FIRE

There are many causes due to which people may put themselves into “LINE OF FIRE” such as:

- ❖ Situations where workers put themselves in harm's way by virtue of the type of work they are carrying out.
- ❖ Lack of awareness
- ❖ Lack of education
- ❖ Hazards can be hard to recognize and can Cause injury
- ❖ Incapacitate
- ❖ In severe cases, kill the employee or co-workers.

The line separating safety from danger is sometimes quite small. To avoid crossing that line, we must

- Always be aware of the hazards around us (think about proximity Hazards)
- Understand the machines and operations at work areas.
- Take the time to think about the possible consequences that may result from where we place our bodies or the actions we perform.

By doing above practices, one can avoid suddenly finding himself in the “line of fire”

DON'T
WALK PAST



હંમેશા ધ્યાન રાખો...
અસુરક્ષિત કાર્ય અને સ્થિતિ
જોઈને અજાણ્યુ ના કરે !

हमेशा ध्यान रखें....
असुरक्षित कार्य / स्थिति देख कर अनदेखा न
करे

to any Unsafe Act / Unsafe Condition



Excellence
is Nothing But
A Passionate Journey
driven by
Positive Attitude.....





The Journey Continues...

