



Mechanical

The energy of the components of a **mechanical** system, i.e. rotation, vibration, motion, etc. within an otherwise stationary piece of equipment / machinery.

EXAMPLES

Rotating equipment, compressed springs, drive belts, conveyors, motors, articulating equipment, fans, pulleys, striking / pounding, pinch points

MITIGATIONS

- Confirm machinery guard integrity
- Provide protective barriers
- Observe to monitor proximity of people and equipment
- Shut down or lockout equipment
- Inspect equipment and tools
- No use of modified tools
- Use protective guards
- Use correct tools and equipment for task
- Protect or remove sharp edges



Motion

The change in position of objects or substances.

EXAMPLES

Vehicles, vessels or equipment movement, flowing water, wind, body positioning (lifting, straining, or bending), gear / piston movements, vibration, human interfaces, debris releases

MITIGATIONS

- Assess manual handling task
- Limit load size
- Manage posture
- Confirm stability of load and work platform
- Get assistance or mechanical aid to avoid pinch points
- Assess equipment / site condition
- Implement controls on users or access
- Limit and monitor proximity to live equipment or areas
- Identify and shield uneven surface or projections



Pressure

Energy applied by a liquid or gas which has been compressed or is under a vacuum.

EXAMPLES

Pressure piping, compressed gas cylinders, control lines, vessels, tanks, hoses, pneumatic and hydraulic equipment, pipelines

MITIGATIONS

- Perform isolation - LOTO, blinding, skitter, plug
- Depressure, drain, purge, and vent
- Relieve trapped pressure
- Anticipate residual pressure or fluids
- Spring compression or expansion controls
- Manage pressure or vacuum
- Verify pressure readings



Radiation

The energy emitted from radioactive elements, or sources, and naturally occurring radioactive materials.

EXAMPLES

Lighting issues, welding, arc, X-rays, solar waves, (NORM) scale, microwaves, lasers, non-ionizing sources, electromagnetic radiation and related equipment

MITIGATIONS

- Use barriers and signs to restrict access
- Notify personnel who may be affected
- Implement NORM controls
- Conduct RAD testing



Sound

Sound is produced when a force causes an object or substance to vibrate, the energy is transferred through the substance in waves.

EXAMPLES

Compressors, drilling, impact tools/equipment, high pressure relief, loose parts, air tools, the environment, natural gas or diesel driven engines

MITIGATIONS

- Wear correct hearing PPE
- Manage exposure times
- Shutdown equipment
- Use "quiet" tools
- Sound barriers or curtains
- Provide or use suitable communication techniques



Temperature

The measurement of differences in the thermal energy of objects or the environment, which the human body senses as either heat or cold.

EXAMPLES

Open flame and ignition sources, liquids or gases, hot work, friction, environmental conditions, steam, extreme and changing weather conditions

MITIGATIONS

- Heat: hydration, breaks
- Cold: PPE, heaters
- Heat or cool equipment before work starts
- Install barriers
- Provide warning signs
- Implement cold temperature and brittle failure controls
- Wear thermal gloves or other PPE