

Due to accumulation of energy inside the machinery: e.g.,

- Elastic elements (springs)
- Liquids and gases under pressure
- The effect of vacuum

Mechanical Hazards Due to the Potential for

- Crushing
- Shearing
- Cutting or severing
- Entanglement
- Drawing-in or trapping
- Impact
- Stabbing or puncture
- Friction or abrasion
- High-pressure fluid injection or ejection

Electrical Hazards Due to

- Contact of persons with live parts (direct contact)
- Contact of persons with parts which have become live under faulty conditions (indirect contact)
- Approach to live parts under high voltage
- Electrostatic phenomena
- Thermal radiation or other phenomena, such as the projection of molten particles and chemical effects from short circuits, overloads, etc.

Thermal Hazards, Resulting in

- Burns, scalds, and other injuries by a possible contact of persons with objects or materials with an extreme high or low temperature, by flames or explosions, and also by the radiation of heat sources
- Damage to health by hot or cold working environment

Hazards Generated by Noise, Resulting in

- Hearing loss (deafness), other physiological disorders (e.g., loss of balance, loss of awareness)
- Interference with speech communication, acoustic signals, etc.

Hazards Generated by Vibration

- Use of handheld machines resulting in a variety of neurological and vascular disorders
- Whole body vibration, particularly when combined with poor postures

ADDENDUM D

EXAMPLES OF HAZARDS, HAZARDOUS SITUATIONS, AND HAZARDOUS EVENTS

This checklist is an adaptation from a standard issued by the International Organization for Standardization titled *Safety of machinery. General Principles for Design. Risk assessment and risk reduction*, EN ISO 12100-2012. The checklist is a guide for companies located throughout the world that design and manufacture machinery and equipment that would go into workplaces. Although the checklist pertains to a broad range of equipment, those who use it as a reference must understand that it could not possibly include all hazards and all hazardous situations.

Mechanical Hazards

Due to machine parts or work pieces: e.g.,

- Shape
- Relative motion
- Mass and stability (potential energy of elements which may move under the effect of gravity)
- Mass and velocity (kinetic energy of elements in controlled and uncontrolled motion)
- Inadequacy of mechanical strength

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