

### Hazards Generated By Radiation

- Low-frequency, radio-frequency radiation; microwaves
- Infrared, visible, and ultraviolet light
- X- and gamma rays
- Alpha and beta rays, electron or ion beams, neutrons
- Lasers

### Hazards Generated by Materials and Substances (and their Constituent Elements) Processed or Used by the Machinery

- Hazards from contact with or inhalation of harmful fluids, gases, mists, fumes, and dusts
- Fire or explosion hazards
- Biological or microbiological (viral or bacterial) hazards

### Hazards Generated By Neglecting Ergonomic Principles In Machinery Design; A E.G.,

- Unhealthy postures or excessive effort
- Hazardous situations due to lifting
- Inadequate consideration of hand-arm or foot-leg anatomy
- Neglected use of personal protection equipment
- Inadequate local lighting
- Mental overload and underload, stress
- Human error, human behavior
- Inadequate design, location, or identification of manual controls
- Inadequate design or location of visual display units

### Hazards Deriving from Unexpected Startup, Unexpected Overspeed (or any Similar Malfunction) from

- Failure/disorder of the control system
- Restoration of energy supply after an interruption
- External influences on electrical equipment
- Other external influences (gravity, wind, etc.)
- Errors in the software
- Errors made by the operator (due to mismatch of machinery with human characteristics and abilities)
- Impossibility of stopping a machine under the best possible conditions
- Variations in the rotational speed of tools
- Failure of the power supply

- Failure of the control circuit
- Errors of fitting
- Breakup during operation
- Falling or ejected objects or fluids
- Loss of stability/overturning machinery
- Slip, trip, and fall of persons, related to machinery

### Hazards, Hazardous Situation and Hazardous Events Due to Mobility:

Relating to the traveling function

- Movement when starting an engine
- Movement without a driver in the driving position
- Movement without all parts in a safe position
- Excessive speed of pedestrian-controlled machinery
- Excessive oscillation when moving

Linked to the work position (including driving station) on a machine

- Fall of persons during access (or at/from) the work position
- Exhaust gases/lack of oxygen at the work position
- Fire (flammability of the cab, lack of means extinguish to
- Mechanical hazards at the work position:
  1. Contact with the wheels
  2. Rollover
  3. Fall of objects, penetration by objects
  4. Breakup of parts
  5. Contact of persons with machine parts or tools (pedestrian-controlled machines)
- Insufficient visibility from the work position
- Inadequate lighting
- Inadequate seating
- Noise at the work position
- Vibration at the work position
- Insufficient means for evacuation/emergency

Due to the power source and to the transmission of power

- Hazards from an engine and batteries
- Hazards from transmission of power between machines
- Hazards from coupling and towing