



How to Guard Against Machine Accidents



You cannot plow a field by turning it over in your mind.

When we are using machines, do we recognize the mechanical hazards that exist and whether or not they are safeguarded? Or do we recognize the exposure but feel confident that nothing will become loose and “fly” towards us at high velocity? Well as straightforward as this may appear people do take chances by ignoring the hazards associated with unguarded equipment and continue to use them, that is, until a serious injury occurs. In some instances, as will be indicated below, the persons never get an opportunity to learn from his/her mistake. Crushed hands and arms, severed fingers, blindness, death - the list of possible machinery-related injuries is as long as it is horrifying. Safeguards are essential for protecting workers from needless and preventable injuries. Workers also have a responsibility to ensure safeguards are in place before they use equipment.

Causes of Machine Accidents

- Reaching in to “clear” equipment
- Not using Lockout/Tag out
- Unauthorized persons doing maintenance or using the machines
- Missing or loose machine guards

Where Mechanical Hazards Occur

- Point of operation
- All parts of the machine which move, such as fly-wheels, pulleys, belts, couplings, chains, cranks, discs, gears, etc.
- Feed mechanisms and auxiliary parts of the machine
- In-running nip points



The following is an account of a fatal accident involving the use of a grinder:

INCIDENT: A welder was carrying out maintenance on a quarry excavator bucket. He was using an angle grinder to prepare surfaces for welding when the disk disintegrated.

CIRCUMSTANCES: The hand-held angle grinder was fitted with a 230 mm diameter cutting-off wheel and when it disintegrated, fragments penetrated the victim's chest and abdomen. He was rushed to hospital by rescue helicopter but died the same day.

INVESTIGATION: Initial inspections show that the grinding machine and cutting disk were not compatible and the grinder was not fitted with a guard. The cause of the fatality is that there was no guard in place to prevent the worker from being impacted by the disintegrated and dislodged disk. The root cause of the accident lies with the system that facilitated the use of the incorrect disk with respect to specifications and that allowed a worker to be operating such equipment without adequate guard in place. The following recommendations were made following the accident investigation: Grinding machines and abrasive wheels should always be used in accordance with the manufacturer's instructions. In particular:

- Always ensure the maximum speed (the no load rpm) marked on the abrasive wheel is greater than the rated speed of the grinder
- Do not use grinding wheels that are larger than the maximum recommended size, or worn down wheels from other grinders
- Never use grinding wheel power tools without the wheel guard attached to the tool and positioned for maximum safety

- Store and handle abrasive wheels with care and inspect them for chips or cracks before installing; do not use any wheel that may be damaged
- Always use appropriate personal protective equipment when using grinders

Risk assessment must be completed for such tasks & then reviewed with the workers. All workers using tools must be given instruction, training, supervision and information on how to use the tools in a safe and controlled manner.

Lessons Learned

- If you have all the ingredients to cause an accident then chances are the accident will happen and one wonders whether this event was planned or unplanned
- Engineering safeguards provide the best means of controlling hazards
- Machines are usually controlled by people who have a mind to determine whether or not the machines are
- Safe to use if we leave the thinking to the machine then we can expect anything at any time
- Whatever management permits, management condones...this gives employees the license to act wrong/right, safely/unsafely

