Machine Guarding



PREAMBLE

Machine guarding is a safety feature on or around manufacturing or other engineering equipment consisting of a shield or device covering hazardous areas of a machine to prevent contact with body parts or to control hazards like chips or sparks from exiting the machine. Machine guarding provides a means to protect humans from injury while working nearby or while operating equipment. It is often the first line of defense to protect operators from injury while working on or around industrial machinery during normal operations.

Manufacturers design their machines to protect operators from coming into contact with hazardous parts causing amputations, lacerations, and crushing injuries. Many of these injuries were caused by unsafe operation or improper maintenance. **Machine guards**, or barriers between the operator and dangerous parts, are one of the most common strategies to prevent these injuries.

Types of Machine Guards

There are several different types of **machine guards**. The most common types of machine guards are:

- Fixed guards
- Interlocking guards
- Adjustable guards
- Self-adjusting guards

INCIDENT

On Nov. 16, 2016, Nissan North America sent 46-year-old maintenance technician Dennis Pinkston to investigate an equipment breakdown.

Pinkston, along with the rest of the maintenance crew at the company’s Smyrna, Tenn. plant, discovered the roller drive motor for an elevator, which is designed to move car seat pallets from one conveyor system to another, was not working.

They removed some machine guarding and set to work. However, when checking whether the elevator correctly was functioning, the crew neglected to place the

machine guarding back where it had been, according to Tennessee OSHA.

OSHA described the following actions that led to Dennis Pinkston's death:

"After replacing the drive motor, the employee was testing the lift table. He leaned into an opening to look under the lift table as the table was being raised. He was struck by a counterbalance weight that was descending as the lift table was elevated. A guard for the opening had been removed for the repair and not replaced to cover the opening before the lift table was activated."

Pinkston was struck in the back of the head. The counterweight, which weighed 1,275 lbs. pushed his head downward, where his head was caught between the weight and the top of the metal guarding system.

Emergency services were called, and he was transported to a nearby hospital but did not survive.

Pinkston had been a maintenance technician at Nissan North America since 2004 and was authorized to perform service on machines and equipment. He had received training on lockout/tagout procedures.

However, Tennessee OSHA's subsequent investigation revealed that while lockout/tagout steps were taken, the mesh machine guard was not replaced and Pinkston was not positioned far enough away from the machinery while performing a final test.

The agency discovered that Nissan North America had failed to perform routine equipment inspections or check whether it complied with the 29 CFR 1910.147 standard which details periodic inspections. In addition, Nissan received a **Repeat -Serious violation** because lockout/tagout devices were not replaced once maintenance was completed. The company previously had been cited for this in 2014.

Nissan North America has 30 days to pay a total of $29,000 as a result of the incident.

Despite Pinkston's death, the company received an overall "effective" rate for its safety and health program.

"The safety and well-being of our employees is always our top priority," the company said in a media statement. "We dedicate extensive time and resources to safety programs and training at the plant. Nissan is working through TOSHA's established process to contest these citations and bring this matter to a close. We also continue to work on determining what can be done to prevent future occurrences."

"I was mad at first, but once I read the report – I mean the way the reports wrote and all that, it's obviously just an accident," Pinkston's brother told local TV outlet WSMV 4 in an interview. "It's an accident that could've been avoided if the guard had been put back in place. After reading that, that's going to bother me for a long time. It could've very well been avoided."

BUSINESS / REGULATION

Moving machine parts create workplace hazards and potential machinery-related

injuries, making machine guards vitally important. **Machine safeguarding can help you protect workers from preventable injuries.**

OSHA's requirements for machine guarding are found in **29 CFR 1910 Subpart O**, **Machinery and Machine Guarding.** The regulation is broken down into these components:

1910.211 – Definitions 1910.212 – General requirements for all machines 1910.213 – Woodworking machinery 1910.214 – Cooperage machinery [Reserved] 1910.215 – Abrasive wheel machinery 1910.216 – Mills and calendars in the rubber/plastics industries 1910.217 – Mechanical power presses 1910.218 – Forging machines 1910.219 – Mechanical power-transmission apparatus

General requirement 1910.212(a)(1) states that one or more methods of machine guarding must be used to protect operators and other employees from hazards, including those created by point of operation, in-running nip points, rotating parts, flying chips and sparks.

Hazardous Mechanical Motions and Actions

Identifying hazards is the first step toward protecting workers and promoting safety in the workplace.

Federal Law Mandates

Under federal law, you are entitled to a safe workplace. Your employer must provide a workplace free of known health and safety hazards. If you have concerns, you have the right to speak up about them **without fear of retaliation**. You also have the right to:

- Be trained in a language you understand
- Work on machines that are safe
- Be provided required safety gear, such as gloves or a harness and lifeline for falls
- Be protected from toxic chemicals
- Request an OSHA inspection, and speak to the inspector
- Report an injury or illness, and get copies of your medical records
- See copies of the workplace injury and illness log
- Review records of work-related injuries and illnesses
- Get copies of test results done to find hazards in the workplace

STATISTICS

Employee exposure to unguarded or inadequately guarded machines is prevalent in many workplaces. Consequently, workers who operate and maintain machinery suffer approximately 18,000 amputations, lacerations, crushing injuries, abrasions, and over 800 deaths per year. Amputation is one of the most severe and crippling types of injuries in the occupational workplace, and often results in permanent disability.

PREVENTION

General Safety Precautions

To avoid potentially life-threatening injury, employees should receive proper training before operating any machines or power tools. Employees must never operate machinery without prior training. **Employees must:**

- Inspect all tools and guards before each use
- Follow all proper lockout/tag outprocedures when necessary
- Use proper procedures when setting up a machine, adjusting a machine, clearing jams, and cleaning or lubricating parts
- Never remove guards while operating a machine
- Tag all damaged guards and machinery “Do Not Use” and report them immediately

METHODS OF SAFEGUARDING

There are five (5) general types of machine safeguards that can be used to protect workers and personnel in the immediate vicinity of machinery.

- **Guards**– these are physical barriers that prevent contact. They can be fixed, interlocked, adjustable, or self-adjusting.
- **Devices**– these limits or prevent access to the hazardous area. These can be presence-sensing devices, pullback or restraint straps, safety trip controls, two-hand controls, or gates.
- **Automated Feeding and Ejection Mechanisms**– These eliminate the operator’s exposure to the point of operation while handling stock (materials).
- **Machine Location or Distance**– this method removes the hazard from the operator’s work area.
- **Miscellaneous Aids**– these methods can be used to protect both operators and people in the immediate vicinity of operating machinery. Examples include shields to contain chips, sparks, sprays or other forms of flying debris; holding tools that an operator can use to handle materials going into the point of operation; and awareness barriers to warn people about hazards in the area.