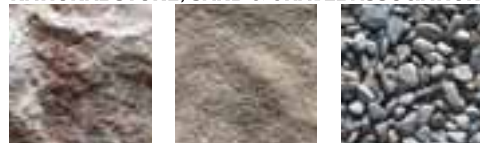




RIP & SHARE SAFETY HANDOUT



NATIONAL STONE, SAND & GRAVEL ASSOCIATION



Natural building blocks for quality of life

Guarding

Each year many miners are injured, sometimes fatally, because appropriate guarding has not been installed at the work site to protect them from unsafe areas. Sometimes the guarding has been installed but does not meet federal standards. In other cases, it has been removed in an unsafe manner to perform certain job tasks, such as when equipment is still operating, or it has not been appropriately replaced after routine maintenance and repair work has been completed, leaving the next shift of workers exposed to dangerous operating equipment or other unsafe situations.

Citations related to guarding are the most common safety infractions identified by MSHA inspectors. For metal and nonmetal mines, violations pertaining to guarding standards were the most frequently cited in 2007. They were also the most frequently cited standards for NSSGA member operations. In 2007, 56.14107 (no or inadequate guard) was cited 4,350 times and 56.14112 (guard removed and not replaced) 1,185 times.

The guarding standards cited by inspectors are:

30 CFR § 56.14107. Moving machine parts

- (a) Moving machine parts shall be guarded to protect persons from contacting gears, sprockets, chains, drive, head, tail, and take-up pulleys, flywheels, couplings, shafts, fan blades and similar moving parts that can cause injury.
- (b) Guards shall not be required where the exposed moving parts are at least seven feet away from walking or working surfaces.

30 CFR § 56.14112. Construction and maintenance of guards

- (a) Guards shall be constructed and maintained to:
 - (1) Withstand the vibration, shock and wear to which they will be subjected during normal operation; and
 - (2) Not create a hazard by their use.
- (b) Guards shall be securely in place while machinery is being operated, except when testing or making adjustments which cannot be performed without removal of the guard.

All moving parts identified under this standard are to be guarded with adequately constructed, installed and maintained guards to provide the required protection. This standard is to be cited when a guard at conveyor locations does not extend a distance sufficient to prevent any part of a person from accidentally getting behind the guard and becoming caught, or in those instances when there is no guard at the conveyor-drive, conveyor-head, conveyor-tail or conveyor take-up pulleys.

Any machine part, function or process that might cause injury must be guarded. When the operation of a machine or accidental contact with it could injure the operator or others in the vicinity, the hazards should be either controlled or eliminated.

Requirements for Guarding

Dangerous moving parts in three basic areas require safeguarding:

- The point of operation: That point where work is performed on the material, such as cutting, shaping, boring or forming of stock.
- Power transmission apparatus: All components of the mechanical system that transmit energy to the part of the machine performing the work. These components include flywheels, pulleys, belts, connecting rods, couplings, cams, spindles, chains, cranks and gears.
- Other moving parts: All parts of the machine that move while the machine is working. These may include reciprocating, rotating and transverse moving parts, as well as feed mechanisms and auxiliary parts of the machine.

When these types of hazardous mechanical motions and actions are present, safeguards should meet these minimum general requirements:

Prevent contact: The safeguard should prevent hands, arms and any other part of an operator's body from making contact with dangerous moving parts. A good safeguarding system eliminates the possibility of the operator or another worker placing parts of their bodies near hazardous moving parts.

Secure protection: Operators should not be able to easily remove or tamper with the safeguard, because a safeguard that can easily be made ineffective is not a safeguard at all. Guards and safety devices should be made of durable material that will withstand the conditions of normal use and should be firmly secured to the machine.

Protect from falling objects: The safeguard should ensure that no objects can fall into moving parts. A small tool dropped into a cycling machine could easily become a projectile that could strike and injure someone.

Create no new hazards: A safeguard defeats its own purpose if it creates a hazard such as a shear point, a jagged edge or an unfinished surface that could cause a laceration. The edges of guards, for instance, should be rolled or bolted in such a way to eliminate sharp edges.

Create no interference: Any safeguard that impedes an operator from performing the job quickly and comfortably might soon be overridden or disregarded. Proper safeguarding may actually enhance efficiency since it relieves the operator's apprehensions about injury.

Allow safe lubrication: If possible, workers should be able to lubricate the machine without removing the safeguards. Locating oil reservoirs outside the guard, with a line leading to the lubrication point, will reduce the need for the operator or maintenance operator to enter the hazardous area.

Figure 1

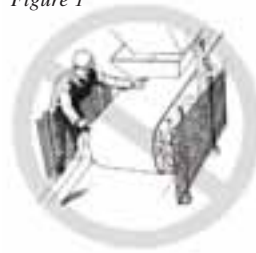
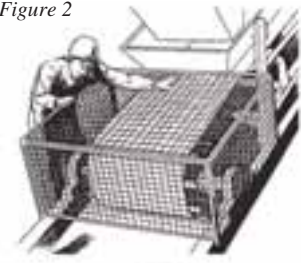


Figure 1 shows an inadequate conveyor tail pulley guard. The rear and top of the pulley are fully exposed providing access to moving machine parts.

Figure 2



The guard in Figure 2 covers the pinch point and the moving parts of the tail pulley. If properly maintained, this design can prove effective in preventing contact during work-related activities.

The guarding standards have been in place for years, but fatalities and serious injuries continue to occur. To illustrate, the following are narratives taken from recent metal and nonmetal fatality reports:

On September 20, 2007, a 49 year-old laborer with 32 years experience (two days at the mine) was fatally injured at a sand and gravel operation. The victim went behind a guard, used a wooden handle shovel to clean under a conveyor belt take-up pulley and was entangled in the pulley.

On April 4, 2006, a 23-year-old laborer with one month mining experience was fatally injured at a sand and gravel operation. The victim had entered the area under the crusher and traveled near the back side of the discharge conveyor tail pulley. His clothing became entangled in the rotating tail pulley.

On May 3, 2006, a 19-year-old laborer with four weeks of mining experience was fatally injured at a sand and gravel operation. The victim was underneath a feeder conveyor belt and was adjusting it when he became entangled between the belt and the return idler.

On January 25, 2005, a 49-year-old quarry operator with 14 years mining experience was fatally injured at a cement operation. The victim was cleaning loose material and pumping water from the primary crusher conveyor belt basement. He contacted an unguarded return idler that was about four feet above the ground and was trapped between the conveyor belt and the return idler. ■

This product was developed as part of the MSHA Alliance Program. It does not necessarily reflect the official views of MSHA. Use of the Alliance Program logos is reserved for MSHA and its active Alliance partners. The MSHA Alliance Program is designed to promote miner safety and health through voluntary partnerships, which provide training and education, outreach, technical assistance and a national dialog on mine safety and health. For more information, contact MSHA, www.msha.gov/alliance/alliances.htm.