



## Ergo Tip of the Month - May 2008

### Is Your Machine Guarding Considering the Human – Machine Interface?

Coming into contact with moving objects and equipment has caused deaths and serious injuries in the U.S. for many years. In fact, 2006 marked the year where 993 workers were killed by making contact with moving objects and equipment, making this the highest total in all industry for that year (U.S. Bureau of Labor Statistics). Machinery-related injuries might include crushed hands and arms, severed fingers, and even blindness. This means safeguards are essential for protecting workers from needless and preventable injuries and fatalities.

So, why are there so many deaths and serious injuries related to industrial machines? There's a long list one could ponder upon which would include maintenance personnel bypassing existing machine guards and, even, non-effective machine guards, but, nonetheless, employers are responsible for insuring machine guards are in place for dangerous moving equipment and objects.

Under OSHA 1910.212 (a) one or more methods of machine guarding shall be provided to protect workers in the machine area from hazards created by point of operation, ingoing nip points, rotating parts, flying chips and sparks, and more. Simply put, any machine part, function, or process that may cause injury must be safeguarded and effective safeguarding must account for the human-machine interface. Is the guarding designed effectively to prevent all sizes of workers from gaining access? Is training and an effective process in place for machine guarding to ensure operator understanding and ability to follow the process?

#### **The Basics**

Machine guards must prevent contact between the human and machine by eliminating the possibility of placing body parts near hazardous moving objects. From an ergonomic design perspective for example, guards to prevent hand accessibility should be designed ensure that even the smallest hand cannot gain access. They must also be secured in such a way as not to be easily removed or tampered with, made by durable material that will withstand normal wear and tear, and be firmly secured to the machine. Machine guards should protect against falling objects that may fall into the moving parts, and no new hazards should be introduced as a result of guarding, such as a shear points or jagged edges. To prevent an employee from overriding the guarding, machine guarding should not create interference. Finally, machine guards must allow for safe lubrication. This would prevent the removing of guarding when lubrication is needed.

#### **Types of Machine Guards**

- Fixed Barrier - permanent part of machine and not dependent upon moving parts
- Interlocked - moving parts stop when guard is open or removed
- Adjustable- provides barrier between danger area(s) and operator
- Self-Adjusting - a barrier determined by movement of stock
- Presence Sensing - protects individuals by initiating an immediate stop command to the machine control system when the sensing field is interrupted.
- Gate - must be interlocked so that machine will not begin a cycle unless gate guard is in proper location.

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**Devices for safeguarding**

- Safety edge device –provide quick means for deactivating the machine in an emergency
- Two-hand control – requires use of both hands for actuation
- Pullback and Restraints – keeps hands out of hazard
- Safety mats – Initiates immediate stop command when person is on mat

**References**

U.S. Bureau of Labor Statistics (CFOI) Home Page. 17 April 2008. U.S. Bureau of Labor Statistics. 26 April 2008 [www.bls.gov/iif/oshcfoi1.htm#2006](http://www.bls.gov/iif/oshcfoi1.htm#2006)

29 CFR 1910 OSHA General Industry Regulations. OSHA, (2005).

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