Machine Guarding

Debbie Rauen, INSafe Safety Consultant
Mark McDaniel, INSafe Safety Consultant

Purpose

• Understanding the different types of machine guarding & devices
• National emphasis
Objectives

• Machine guarding principles
• Types of machine guarding
• Self audits
• Training

Responses...

• “We have been doing it this way for 20 years and nobody got hurt.”
• “The machine came that way.”
• “Nobody is going to stick their hands in there.”
• “Nobody goes behind the machine.”
• “The guard is in the way.”
• “The OSHA inspector never said anything.”
Best Response Ever?

“We will put the guard back if OSHA shows up.”
Subpart O of the OSHA Standard

- 29 CFR 1910.212-219
- 29 CFR 1910.243

What is a Machine Guard?

- Machine guards are the primary line of defense between workers and their machines
- Any machine part, function, or process that may cause injury must be safeguarded
- Guard must be secure, protect from falling objects and create no new hazards
Machine Hazards Occurrence

- Point of operation - work performed
  - Cutting, shaping, boring, forming
- Mechanical power transmission
  - Flywheels, pulleys, belts, sprockets, connecting rods, cams, spindles, gears
- Other moving parts
  - Rotating, reciprocating, feeds

Non-mechanical Hazards

- Electrical - proper grounding & wiring
- Noise
  - Startle, disrupt concentration, interfere with communication
- Cutting fluids, coolants
Methods of Machine Guarding

- Guards
- Devices
- Location/distance

Types of Guards

- Fixed
- Adjustable
- Self adjusting
- Interlock
Safeguarding Devices

- Presence sensing
- Pullback
- Restraint
- Safety controls and trips
- Gates

Holding Tools

- Used to place and remove stock in the danger area
- Not to be used instead of other machine safeguards, but as a supplement
### 29 CFR 1910.217 – Table 0-10

#### Guarding by Distance is Acceptable When:
- Guards are not feasible
- Limited to one-time only fabrication
- Training
- Good history & enforcement

#### OSHA Guard-Opening Requirements

The maximum permissible opening for guards as required by OSHA 29 CFR 1910.217 for mechanical power presses is as follows:

<table>
<thead>
<tr>
<th>Distance of Operator from Point of Operation</th>
<th>Maximum Width of Guard</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 ft or less</td>
<td>1/4 in.</td>
</tr>
<tr>
<td>1 ft to 2 ft</td>
<td>1/2 in.</td>
</tr>
<tr>
<td>2 ft to 3 ft</td>
<td>3/4 in.</td>
</tr>
<tr>
<td>3 ft to 4 ft</td>
<td>1 in.</td>
</tr>
<tr>
<td>4 ft to 5 ft</td>
<td>1 1/2 in.</td>
</tr>
<tr>
<td>5 ft to 6 ft</td>
<td>2 in.</td>
</tr>
<tr>
<td>6 ft to 7 ft</td>
<td>2 1/2 in.</td>
</tr>
<tr>
<td>7 ft to 8 ft</td>
<td>3 in.</td>
</tr>
<tr>
<td>8 ft to 9 ft</td>
<td>3 1/2 in.</td>
</tr>
<tr>
<td>9 ft to 10 ft</td>
<td>4 in.</td>
</tr>
<tr>
<td>Over 10 ft</td>
<td>4 1/2 in.</td>
</tr>
</tbody>
</table>
Self-Audit

- Document recognized hazards
- Hazards have been corrected
- Accompany all outside visitors
- Encourage employee participation

Fixed Guards
Interlock Guard

Adjustable Guards
Self-Adjusting Guard

Guarding Devices

- Presence sensing - photoelectrical
- Radio frequency
- Electrical mechanical
Guarding Devices

Pullback and Restraint Guarding
Safety Trip Control Devices

Two-Handed Trip Devices
Feeding and Injection Guard

Barrier Guards
Robotics – Multiple Guarding

Machine Guarding Checklist

<table>
<thead>
<tr>
<th>Machine Guarding Checklist</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Date</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Organization</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Machine Name</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**SPECIFIC GUARDING REQUIREMENTS**

- **Points of Operation:**
  - Is there a guard or safety device provided for each point of movement of the machine?
  - Do the guards allow the operator access, arms, or other body parts to make contact with hazardous machine parts?
  - Is the guards housing, hood, or cover properly reinforced to prevent accidental opening?

- **Power Transmission Apparatus:**
  - Are there any guards/enclosures, aprons, guards, shields, covers, or other equipment on the equipment?
  - Are power-transmitting guards/protective guards/valves/protection/points by which the arm, leg, or other body parts are protected from the guarded area?

- **Operator Controls:**
  - Are the controls/shifting controls within each of the operators’ reach?
  - Are the controls/shifting controls guarded against accidental activation?
  - Are the controls/shifting controls a safety function?
  - Are emergency stop controls accessible and clearly identified?
Training

- Hazards associated with the machine and/or equipment
- How the safe guards provide protection
- How to use the safe guards
- How and when safe guards can be removed
- Who is allowed to remove safe guards
- Who to contact if safe guards are damaged or missing

Review

- Machine guarding principles
- Types of machine guarding
- Inspections
- Training
Contact Information

Mark McDaniel
mmcdaniel@dol.in.gov
317-232-2688

Debbie Rauen
drauen@dol.in.gov
317-232-2688