

SAFETY TRAINING FOR MANCON EMPLOYEES IN MAINTENANCE/MACHINERY POSITIONS

MANCON employees perform a variety of kinds of work, in a variety of MANCON and non-MANCON work locations.

The following safety topics and attached training will help you be aware of potential safety hazards in your workplace. These trainings are not all inclusive of the potential hazards in the workplace but provide you an overview of the types of hazards you may encounter. Contact your MANCON supervisor regarding specific questions or concerns for safety in the workplace.

1. Maintaining Machinery
2. Focus on Safety – Basics on Machine Safeguarding
3. Focus on Safety – Electrical Safety

Additional safety training materials are available by contacting the MANCON Human Resources Department.

As a reminder, if you experience an injury, illness, or exposure due to the workplace, please contact your MANCON supervisor for assistance with the MANCON Workers Compensation claim procedures.

Maintaining Machinery

In English

En español

Some Things to Know Before You Give Your Talk

As supervisor, you need to tell your crew about the hazards involved when they maintain machinery.

Most injuries involving machinery fall into three categories:

1. **Caught in moving machinery:** gears, levers, rollers, conveyors.
2. **Injured by power sources:** springs, hydraulic pressure, electricity.
3. **Falls from or bumping against:** usually caused by slippery or makeshift work surfaces/elevated work platforms.

Machine Safety Tips

- Before working on any machine, *turn off and lock out* its source of power.
- Don't lubricate running machinery unless remote lubrication points are provided and the work can be done safely, according to the manufacturers instructions.
- Don't assume that you can do your work quickly without anyone noticing the equipment is off. Someone could turn the power on without realizing you are located in a dangerous position.
- Don't overlook sources of potential energy. Springs under tension or compression, pressurized hydraulic systems, electrical batteries/condensers all can activate mechanical components without warning *unless the power sources are isolated or neutralized*.
- Make sure you are standing on a slip free work surface. If you have to reach too far to perform a task, find a better way to complete the task.
- Dress adequately for the job:
 - No loose clothing or rings. These can snag on equipment.
 - Wear eye protection, including side shields or goggles, to protect eyes from dirt, oil, hydraulic fluid, flying objects, etc.
- Clean up spilled material from the equipment. Do not leave a slipping hazard that could injure others or help fuel a fire.
- Never remove another workers' lock or tag. If the mechanic cannot be contacted (works another shift, etc), inform your supervisor of the situation.

Try This for Show and Tell

Show locks and lockout devices that are used in your company's lockout program.



FOCUS on Safety

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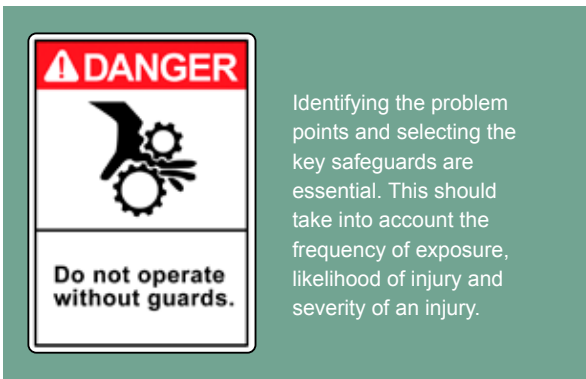
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Basics of Machine Safeguarding

OSHA STANDARDS

Any machine part, function or process that may cause injury must be safeguarded. When accidental contact with a machine or its operation can injure the operator or others, the hazards must be either eliminated or controlled. Crushed hands and arms, amputations, and eye injuries are just some of the possible machinery-related injuries. Improper safeguarding may even lead to death. Safeguards are essential for helping workers avoid needless and preventable injuries.

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BASIC AREAS REQUIRING SAFEGUARDING

Point of Operation: Point where work is performed on the material – includes cutting, punching, boring, bending, shearing

Power Transmission Apparatus: Components that transmit energy to part of machine performing work – includes flywheels, pulleys, belts, gears, cranks, chains

Other Moving Parts: All parts of the machine that move while working – includes reciprocating, rotating, transverse, moving parts and feed mechanisms

METHODS OF SAFEGUARDING

1. Eliminate:

Find an alternative method to reach the desired process output.

2. Safeguard with Engineering:

Guards – properly installed fixed barrier, interlocked, adjustable

Devices – presence sensing, pullbacks, two-hand controls, gates; must be installed per guard safe opening and safety requirements

Location/distance

Feeding and ejection methods – automatic and semiautomatic

Miscellaneous – holding fixtures

3. Administrative Controls:

Posted warnings, training, disciplinary programs, close supervision and PPE

Even the most elaborate safeguarding system cannot offer effective protection unless the worker knows how to use it and why. Therefore, training is a crucial part of any effort to provide safeguarding against machine-related hazards. Employees need to be trained on how to use the safeguards, why they are important, under what circumstances they can be removed and what to do when a safeguard becomes damaged.

MACHINE GUARDING IS A FREQUENTLY CITED VIOLATION IN MANY WORKPLACE INSPECTIONS.

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BASIC REQUIREMENTS*

- Prevent hands, arms and other parts of a worker's body from making contact with dangerous moving parts.
- Choose durable material that will withstand conditions of normal use.
- Secure the guard to the machine so that it cannot be easily removed.
- Protect from falling objects that could fall into moving parts and create projectiles.
- Create no new hazards – sharp edges or shear points – when making the guard.
- Create no interference that would prevent the worker from performing the job quickly and comfortably.
- Allow safe lubrication of the machine without having to remove the guard.

Safeguards must meet these minimum general requirements and all applicable standards.

FOR MORE INFORMATION:

Contact Liberty Mutual's Loss Control Consulting Center
Telephone: **(866) 757-7324**
E-mail: **CSUConsulting@libertymutual.com**

RESOURCES

- OSHA 3067 – Basics of Machine Safeguarding
http://www.osha.gov/Publications/Mach_SafeGuard/chapt1.html
- OSHA 1910.212 – Machine Guarding
http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=standards&p_id=9836
- Liberty Mutual Loss Control Reference Note LP 5031 – Machine Safety: A Guide for Supervisors
- LC 5348 – Assessing the Risk of Machine Injuries
- LC 248 – Using Safety Distance for Presence Sensing Devices, Two-Hand Controls and Two-Hand Trips/Controls
- Standard Drawings 2112, 2111, 2110, 2063-2: Guard Safe Opening Distances, In-Running Rolls, Power Press, Vertical Shears, etc.
- OSHA Publication 3170 – Safeguarding Equipment and Protecting Employees from Amputations
<http://www.osha.gov/Publications/OSHA3170/3170-02R-2007-English.html>
- NIOSH Safety and Health Topic – Machine Safety
<http://www.cdc.gov/niosh/topics/machine/>
- OSHA Machine Guarding eTool –
<http://www.osha.gov/SLTC/etools/machineguarding/index.html>



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Electrical Safety

Nearly all workers in the country directly or indirectly work with electricity in their daily work routine. Many overlook possible electrical hazards and fail to understand the potential consequences. Working with or near electrical circuits may expose employees to electric shock, burns, fires, and even explosions. According to Bureau of Labor Statistics preliminary data, over 300 workplace fatalities resulted from contact with electrical current in 2009.

EFFECTS OF ELECTRICITY ON THE BODY (According to the Occupational Safety and Health Administration)

< 1 milliamperes	Generally not noticeable
1 milliamperes	Faint tingle
5 milliamperes	Slight shock. Average person can let go.
6 – 30 milliamperes	Painful shock, loss of muscle control. Average person cannot let go.
50 – 150 milliamperes	Extreme pain, respiratory arrest, severe muscular contractions. Death is possible.
1,000 – 4,300 milliamperes	Rhythmic pumping action of the heart ceases. Muscular contraction and nerve damage. Death likely.
10,000 milliamperes	Cardiac arrest, severe burns. Death probable.



MOST ELECTRICAL ACCIDENTS RESULT FROM ONE OF THE FOLLOWING THREE FACTORS:

- Unsafe equipment or installation
- Unsafe environment
- Unsafe work practices

FOUR MAIN TYPES OF ELECTRICAL INJURIES

- Fatal electrocution
- Electric shock
- Burns
- Falls caused as a result of contact with electrical energy

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PROTECTING AGAINST ELECTRICAL HAZARDS

- Only allow trained, qualified employees to work on electrical equipment.
- Provide safety awareness training for individuals working with electrical equipment such as computers, machines, and appliances.
- De-energize all circuits and equipment before starting any electrical work.
- Always close electrical control panels and cover receptacle boxes.
- Wear proper personal protective equipment, such as rubber-soled shoes or boots, when working around electrical equipment on damp or wet surfaces.
- Strictly follow lockout procedures for all machines when required.
- Based on the National Electric Code requirement, use a ground fault circuit interrupter (GFCI) if:
 - Electricity is used near water
 - The user of electrical equipment is grounded
 - Power is being provided to portable tools or outdoor receptacles
 - Temporary wiring or extension cords are used
- Ensure all cords and tools used while working have adequate insulation.
- Use extension cords that have a ground conductor, a three-prong plug with a grounding prong on one end of the cord, a three-wire receptacle for the other end of the cord, and a properly grounded outlet.

If a person is “frozen” to a live electrical contact, shut off the current immediately. If this is not possible, use boards, poles, or sticks made of wood or any other nonconducting materials and safely push or pull the person away from the contact. It’s important to act quickly, but remember to protect yourself as well from electrocution or shock.

RESOURCES

National Fire Protection Association 70E

Occupational Safety and Health Administration 29 CFR 1910 Subpart S

LIBERTY MUTUAL SAFETY CATALOG

www.libertymutualsafety.com

RESEARCH INSTITUTE FOR SAFETY

Publications

Electrical Safety Scientific Papers

From Research to Reality® Newsletter – Work-Related Electrical Injuries: Study Sparks New Insights

LIBERTY MUTUAL SAFETYNET

Model Safety Plan: Core Elements of a Safety and Health Program, LP 6215

Model Safety Plan: Lockout/Tagout, LP 5295

Model Safety Plan: Personal Protective Equipment, LP 5314

LIBERTY MUTUAL REFERENCE NOTES

LC 5415 – Arc Flash Precautions

LP 5507 – Small Employer Electrical Inspection Checklist

LP 5425 – Working on Energized Electrical Circuits

LP 6232 – Workplace Hazard Assessment Form

LIBERTY MUTUAL CUSTOMER TRAINING

Machine Safeguarding Seminar

FOR MORE INFORMATION

Contact Liberty Mutual’s Loss Control Consulting Center

Telephone: (866) 757-7324

E-mail: CSUConsulting@libertymutual.com