

# Chapter 3 - Energy Control Program

## Purpose

The purpose of the OSU energy control program is to clearly define procedures for the control of hazardous energy. These procedures cover the servicing and maintenance of equipment in which the unexpected energizing, start up, or release of stored energy could cause serious injury to employees. All sources of energy, including electrical, mechanical, hydraulic, pneumatic, chemical, gravitational, and thermal need to be considered.

## 1. Lockout/Tagout Procedures

The primary method of control of hazardous energy is utilization of lockout/tagout procedures. Supervisors are responsible for identifying equipment having the characteristics defined above and for providing instruction in the lockout/tagout procedures to employees who work on that equipment. (Training materials are available through EH&S, 7-2505).

Employees trained in lockout/tagout procedures will be designated as authorized employees. Other employees working on or around this equipment, but not trained in the lockout/tagout procedures, will be known as affected employees.

The basic rule mandates that all equipment shall be locked or tagged to protect against accidental or inadvertent operation when such operation could cause injury to personnel.

### Lockout versus Tagout

Lockout shall be the exclusive method used for the isolation of all energy sources that are designed to accept a locking device. Tagout devices, such as tags or signs, must be used if a locking device cannot be attached to the control switch or valve.

Tags and their means of attachment are to be substantial enough to prevent inadvertent or accidental removal. Nylon cable ties are the recommended method of tag attachment. Whenever major replacement, repair, renovation, or modification of equipment is performed, and whenever new equipment is installed, the energy control switch or valve for that equipment shall be able to accept a locking device.

### Sequence of Lockout or Tagout System Procedures

The following sequence of lockout or tagout procedures shall be followed in all cases in which an employee is required to remove or bypass a guard or other safety device; and all cases in which an employee is required to place any part of the body into an area on a piece of equipment at the point of operation, or where an associated danger exists during an operating cycle.

1. Notify all employees within the immediate affected area that a lockout or tagout is going to be utilized and the reason why.
2. If the equipment is operating, shut it down by the normal stopping procedure.
3. Operate the switch, valve, or other energy isolating device(s) so that the equipment is isolated from its energy source(s).
4. Lockout and/or tagout the energy isolating devices with assigned individual lock(s) or tag(s). Lockout devices and tagout devices are to indicate the identity of the employee applying the device(s). Following the application of lockout or tagout devices, all potentially hazardous stored or residual energy shall be relieved, disconnected, restrained, or otherwise rendered safe.
5. At this point the equipment is considered to be locked or tagged out.
6. If lockout is the energy control method utilized, the authorized employee is to keep the key in his or her possession for the duration of the lockout period.

## **Restoring Equipment to Normal Operational Status**

### **Procedures Before Removal**

Before lockout or tagout devices are removed and energy is restored to the equipment, the employee shall follow these procedures:

1. Inspect the work area to ensure that non-essential items have been removed and ensure that machine or equipment components are operationally intact.
2. Check the work area to ensure that all employees have been safely positioned or removed.
3. Before lockout or tagout devices are removed and before the equipment is energized, affected employees in the immediate area shall be notified that the lockout or tagout device will be removed.

### **Lockout or Tagout Device Removal**

Each safety lockout or tagout device may only be removed by the employee who applied the device—with one exception. Removal of a safety lockout or tagout device by any other person than the one who applied the device may be done only by the direction of a supervisor and under the following procedure:

1. The supervisor must verify that the authorized employee who applied the device is not at the facility.
2. The authorized employee is to be informed that the lockout/tagout device has been removed before the employee resumes work at the facility.

## **Procedure Involving More Than One Person**

In the preceding steps, if more than one individual is required to lockout or tagout the same equipment, each shall place his or her own personal lockout device or tagout device on the energy-isolating device(s). When an energy-isolating device cannot accept multiple locks or tags, a multiple lockout or tagout device (hasp) is to be used.

When more than one authorized person has implemented lockout/tagout in order to assist in the servicing or maintenance of equipment, only the person who applies the first lock and the person who removed the last lock will be required to notify employees in the immediate affected work area of the application and removal of lockout/tagout devices.

## **Testing or Positioning of Equipment or Components**

In situations in which lockout or tagout devices must be temporarily removed from the energy-isolating device and the equipment energized to test or position the equipment or one of its components, the authorized employee will comply with the following:

1. Clear the machine or equipment of tools and materials.
2. Remove employees from the machine or equipment area.
3. Remove the lockout or tagout device.
4. Energize and proceed with testing or positioning.
5. De-energize all systems and reapply the appropriate energy control device.

## **Outside Personnel (Contractors)**

Whenever outside personnel are to be engaged in activities requiring the control of hazardous energy, they must use a lockout/tagout program. The OSU construction inspector and the outside contractor are to inform each other of their respective lockout or tagout procedures.

## **Periodic Inspection**

The supervisor of each university unit that uses lockout/tagout will perform an annual inspection of the energy control procedure in the unit to ensure that the procedure and the requirements of OR-OSHA lockout/tagout rules are being followed.

1. The annual inspection will be designed to correct any deviations or inadequacies observed.
2. The annual inspection will include a review, with each employee, of that employee's responsibilities under the energy control procedure being inspected.
3. The supervisor will document that the periodic inspections have been performed. The documentation will identify the equipment on which the energy control procedure was being utilized, the date of the inspection, the employees included in the inspection, and the person performing the inspection.

## **Training and Communication**

Training will be provided to ensure that the purpose and procedures of the energy control program are understood by employees and that the knowledge and skill required for the safe application, usage, and removal of lockout/tagout devices are conveyed to employees. The training will include the following:

1. The supervisor will train each authorized employee in the recognition of applicable hazardous energy sources, the type and magnitude of the energy available in the work place, and the methods and means necessary for energy isolation and control.
2. The supervisor will instruct each affected employee in the purpose and use of the energy control procedure.

## **Minimum Training Requirements for Tagout**

Authorized employees will be trained in the following limitations of tags:

1. Tags are essentially warning devices affixed to energy isolating devices, and do not provide the physical restraint on those devices that is provided by a lock.
2. When a tag is attached, it is not to be removed except by the authorized person responsible for it, and it is never to be bypassed, ignored, or otherwise defeated.
3. In order to be effective, tags must be legible and understandable by all employees whose work operations are or may be in the area.
4. Tags and their means of attachment must be made of materials, which will withstand the environmental conditions encountered in the work place.
5. Tags may evoke a false sense of security, and their meaning needs to be understood as part of the overall energy control program.
6. Tags must be securely attached to energy-isolating devices so that they cannot be inadvertently or accidentally detached during use.

## **Employee Retraining**

Retraining will be conducted whenever a periodic inspection reveals, or whenever there is reason to believe, that there are deviations from or inadequacies in the employee's knowledge or use of an energy control device.

## **Documentation of Training**

Supervisors will document that employee training has been accomplished.

## 2. Machinery Guarding Procedures

Manufacturers of new machinery and equipment are legally required to make sure dangerous parts are safely guarded so that operators and others are protected from injury.

Old farm machinery is sometimes poorly guarded. Extra moving parts like wheels and pulleys may have been added for various uses. Original guarding may have been removed for maintenance and not put back.

There may be times when an operator may need to reach over, under, around or into a machine while it is running. If so, any moving parts or other hazards must be appropriately guarded from human contact.

OSHA's machine guarding standard addresses farm machinery hazards and specifies that employees be instructed at initial assignment and again at least once a year to:

- Keep all guards in place when any hazardous machine is in operation.
- Prevent riders on farm field equipment other than persons required for instruction or assistance in machine operation.
- Stop engine, disconnect the power source, and wait for all machine movement to stop before servicing, adjusting, cleaning, or unclogging the equipment, except where the machine must be running to be properly serviced or maintained, in which case the employer shall instruct employees as to all steps and procedures which are necessary to safely service or maintain the equipment.
- Make sure everyone is clear of machinery before starting the engine, engaging power, or operating the machine.
- Lock out electrical power before performing maintenance or servicing farm equipment.

A guard may be any shield, cover, casing, or physical or electronic barrier, intended to prevent contact between a hazardous machine part and any part of a person or a person's clothing.

### **Spot the hazard**

Some of the hazards associated with machinery likely to cause injury include:

- Rotating PTO and other shafts (e.g. joints, couplings, shaft ends and crank shafts);
- Gearing (including friction roller mechanism), cables, sprockets, chains, clutches, cams or fan blades;
- The run-off point of any belt, chain or cable. All belts are hazardous, especially if joints are not kept smooth;
- Keyways, keys, grease nipples, set-screws, bolts or any other projections on rotating parts;
- Any pulley or flywheel that incorporates any openings, spokes, protrusions, etc, that render it anything except totally smooth;

- Any crushing or shearing points, e.g. augers and slide blocks, roller feeds, conveyor belts;
- Ground wheels and track gear that incorporate protrusions, spokes, etc, that are adjacent to an operator's position (standing platform, seat, footrest) or passenger's seat;
- Rotating knives, blades, tines or similar parts of power driven machines that operate in or near the ground or engage crops;
- Any machine component that cuts, grinds, pulps, crushes, breaks or pulverizes farm produce;
- Hot parts of any machine where the surface temperature exceeds 120C in normal operation;

### **Assess the risk**

Once a hazard has been identified, assess the likelihood of the hazard resulting in injury to the operator or any other person, and the likely severity of any injury or harm.

### **Make the changes**

Ensure machinery guards:

- Are designed in a practical way to protect the user but allow ready access for operation and maintenance;
- Are always in place on dangerous parts of machinery unless they are, by any reasonable definition, located out of reach of users, operators or bystanders;
- Are conveniently placed so that users, operators and service and maintenance people are less likely to remove them permanently;
- Are strong and durable enough for the machine part they cover;
- Protect users, operators and bystanders against burns caused by hot parts;
- Are ventilated where applicable to avoid the machine over-heating;
- Are not removed until the machine is stopped and isolated with a tagged lock-out switch, and all sources neutralized, e.g. pressure in the hydraulic, or LPG gas line.

### **Safe procedure**

Utilize safe procedures for machinery guarding.

- For maintenance jobs, have a checklist procedure ensuring guarding is safely replaced.
- Use approved lock-out and tag devices to prevent machinery being accidentally started during maintenance.
- Redesign work processes to minimize risk from moving parts.
- Get rid of machinery and eliminate work processes that can't be made safe.
- Replace unguarded machinery with safer machinery.
  - Have guards designed and fitted for improvised machinery.