



## Purpose

This establishes the Montgomery County Government's (known hereafter as "County") Lockout/Tagout Policy (LOTO program) for protecting all employees including those who must engage in service or maintenance of machines or equipment and who face a possible injury by an unexpected start-up or release of hazardous energy. Service or maintenance includes erecting, installing, constructing, repairing, adjusting, inspecting, unjamming, setting up, trouble-shooting, testing, cleaning, and dismantling machines, equipment or processes.

This policy will ensure that machinery and equipment is stopped, isolated from all hazardous energy sources, and properly locked or tagged out for the safety of all employees and equipment.

## Scope

This program governs the servicing and maintenance of machines and equipment, in which the unexpected start up or energization of the equipment, or release of stored energy, has the potential to cause injury to personnel. Energy sources include electrical, mechanical (hydraulic, pneumatic), chemical, thermal (steam), gravity, electromagnetic fields, as well as other sources of energy.

Servicing and/or maintenance, which takes place during normal production operations, are covered by this section only if:

1. An employee is required to remove or bypass a guard or other safety device, or
2. An employee is required to place any part of his or her body into an area on a machine or piece of equipment where work is actually performed upon the material being processed (point of operation), or
3. Where an associated danger zone exists during a machine operating cycle.

This program applies to all County-owned, leased or operated facilities. All County personnel and contractors under County control must comply with this program.

This document is the written LOTO program for the County and can be used by departments with or without written LOTO programs. However, some departments may be adhering to existing department-specific LOTO programs. In either case, departments may choose to either:

1. Follow and use this program for specific department needs.
2. Develop, maintain, and follow a department-specific written LOTO program that meets the minimum requirements of this policy.



## Definitions

**Affected Employee** - A person who uses equipment that is being serviced under lockout or tagout procedures, or who works in an area where equipment is being serviced.

**Authorized Employee** – Is any person who locks out or tags out equipment to perform service or maintenance work. An affected employee becomes an authorized employee when that employee’s duties include service or maintenance work on equipment.

**Capable of being locked out** - An energy-isolating device that is designed with a hasp or other means of attachment to which, or through which a lock can be affixed, or if it has a locking mechanism built into it. Other energy-isolating devices will also be considered to be capable of being locked out, if lock out can be achieved without the need to dismantle, rebuild, or replace the energy-isolating device or permanently alter its energy-control capability.

**Disconnect** - A switch that disconnects an electrical circuit or load (motor, transformer, or panel) from the conductors that supply power to it. An open circuit does not allow electrical current to flow. Under this lockout procedure all disconnects must be capable of being locked in the open position.

**Energized** - Connected to an energy source or containing potential energy.

**Energy source** - Any source of energy, Examples: electrical, mechanical, hydraulic, pneumatic, chemical, and thermal.

**Energy-isolating Device** – Is a mechanical device that physically prevents the transmission or release of energy.

**Hazardous Energy** - Any of the types of energy existing at a level or quantity that could be harmful to workers or cause injury through inadvertent release or start-up of equipment.

**Lockout Device** – Is a device that locks an energy-isolating device in the safe position.

**Lockout** - Placing a lockout device on an energy-isolating device, under an established procedure, to ensure the energy-isolating device and the equipment it controls cannot be operated until the lockout device is removed. (An energy-isolating device is capable of being locked out if it has a hasp that accepts a lock or if it has a locking mechanism built into it.)

**Procedure** - A series of steps taken to isolate energy and shut down equipment.

**Servicing or Maintenance** - Workplace activities such as constructing, installing, setting up, adjusting, inspecting, modifying, and maintaining machines or equipment. Also includes lubricating, cleaning, unjamming, and making adjustments or tool changes if a worker may be exposed to the unexpected startup of the equipment during such activities.

**Tagout Device** - A prominent warning sign, such as a tag, that can be securely fastened to an energy-isolating device to indicate that the energy-isolating device and the equipment it controls cannot be operated until the tagout device is removed.



**Tagout** - Placing a tagout device on an energy-isolating device, under an established procedure, to indicate that the energy-isolating device and the equipment it controls cannot be operated until the tagout device is removed.

## Employer and Employee Responsibilities

The County is responsible for implementing and enforcing this policy.

All employees must comply with this policy.

Employees who engage in service and maintenance work must follow the lockout/tagout procedures described in this policy.

Employees who work in areas where lockout/tagout procedures are used must understand the purpose of the procedures and are prohibited from removing locks or tags and attempting to restart machines or equipment that are locked or tagged out.

### **Department Heads /Supervisors**

Department Heads/Supervisors are responsible for:

1. Informing all work personnel working in the area (Affected Employees) of the existence of this program and its impact on their work area.
2. Determining which Authorized Employees may work on the equipment.
3. Ensuring that all employees, volunteers, reserves, and elected officials have had documented LOTO training at an appropriately anticipated level of exposure to hazardous energy sources in their workplace.
4. Ensuring that proper labeling is applied to all shutoff locations on equipment controlled by the department. Labeling activities may be conducted by the Supervisor or Authorized Employee, another department member under the leadership of this person, or by an outside contractor.
5. Conducting an annual audit of equipment-specific energy isolation procedures to ensure they are accurate and appropriate. An annual review should also be conducted for all Authorized Employees to assess their understanding of Lockout/Tagout procedures. Ensuring that employees adhere to LOTO procedures when performing servicing or maintenance.
6. Contact Risk Management for assistance in developing energy isolation procedures and providing training to volunteers, reserves, employees, and Authorized Employees as needed.

### **All Personnel**

All personnel, including Affected Employees, are responsible for:

1. Understanding that no person should ever touch or try to actuate an energy source that has been locked and tagged in the off position by someone else.
2. Understanding and following instructions from Authorized Employees.



3. Seeking out trained, designated and Authorized Employees to service and maintain equipment that possess an energy source that could potentially be hazardous to personnel if LOTO procedures are not followed.
4. Ensuring that all incidents and near misses involving the release of hazardous energy are reported to their supervisor as soon as possible.
5. Ensuring that all incidents and near misses are reported to Risk Management immediately.

### **Authorized Employees**

Authorized Employees are responsible for:

1. Establishing and writing machine or equipment specific LOTO procedures.
2. Following LOTO procedures whenever working on applicable equipment.
3. Reporting the presence of equipment for which LOTO procedures have not been established and which pose a potential for injury should an unexpected start-up, energization or release of stored energy occur during servicing or maintenance.
4. Removing personal protection locks and tags. This must occur when:
  - A. Authorized Employees are not working on the equipment.
  - B. A work shift ends.
  - C. A project ends.
5. Verifying that people in the area that are not part of the LOTO work team understand that they are Affected Employees prior to the start of the LOTO procedure.
6. Communicating and coordinating LOTO efforts with all Affected Employees, departmental building coordinators, and facility managers.

## **Lockout and Tagout Devices**

Lockout and tagout devices must meet the following criteria to ensure they are effective and not removed inadvertently:

- Lockout devices must work under the environmental conditions in which they are used. Tagout device warnings must remain legible even when used in wet, damp, or corrosive conditions.
- Lockout and tagout devices must be designated by color, shape, or size. Tagout devices must have a standardized print and warning format.
- Lockout and tagout devices must be strong enough that they cannot be removed inadvertently. Tagout devices must be attached with a single-use, self-locking material such as a nylon cable tie.
- Any employee who sees a lockout or tagout device must be able to recognize who attached the device, when the device was attached (date) and its purpose.
- Each lock must have a unique key or combination.

Energy-isolating devices are the primary means for protecting County employees who service equipment and must be designed to accept a lockout device. Energy isolating devices must clearly identify function.



**Electrical Energy Sources:** Lockout or tagout of electrical energy sources must occur at the circuit disconnect switch. Electrical control circuitry does not effectively isolate hazardous energy. *See also, Alternative methods.*

## Exposure Survey

An Authorized Employee or Supervisor will conduct a hazardous-energy survey to determine affected machines and equipment, types and magnitude of energy, and necessary service and maintenance tasks. Each task will be evaluated to determine if it must be accomplished with lockout or tagout procedures.

## Energy Control Procedures

Authorized employees who lockout or tagout equipment or engage in service and maintenance must follow specific written energy-control procedures. The procedures must include the following information:

- The intended use of the procedure.
- Steps for shutting down, isolating, blocking, and securing equipment.
- Steps for placing, removing, and transferring lockout devices.
- Equipment-testing requirements to verify the effectiveness of the energy-control procedures.

When re-energizing equipment is necessary — when power is needed to test or position the equipment, for example — only the employee that installed the lockout / tagout device allows temporary removal of lockout or tagout devices. This applies only for the time required to perform the task and the procedure must be documented.

### **Employees must do the following before beginning service or maintenance work:**

1. Inform all affected employees of equipment shutdown.
2. Shut down equipment.
3. Isolate or block hazardous energy.
4. Remove any potential (stored) energy.
5. Lockout or tagout the energy sources, use gang hasp whenever possible.
6. Verify the equipment is isolated from hazardous energy and de-energized.
7. Log the equipment into the LOTO Log Book as “Out of Service” and provide explanation.

### **Employees must do the following before removing lockout or tagout devices and re-energizing equipment:**

1. Remove tools and replace machine or equipment components.
2. Inform co-workers about energy-control device removal.
3. Ensure all workers are clear of the work area.



4. Verify machine or equipment power controls are off or in a neutral position.
5. Remove the lockout or tagout device.
6. Re-energize equipment.
7. Log the equipment into the LOTO Log Book as “Back in Service.”

### **Lockout/Tagout procedures**

**Step 1- Identify all energy sources:** The Supervisor or Authorized Employee identifies all energy sources requiring energy isolation applicable to the service and maintenance to be performed

**Step 2- Notify affected employees:** The Authorized Employee checks to be sure that no one is operating the machinery before turning off energy sources. All persons in the area, and especially the machine operator and project supervisor, are informed before the energy sources are being turned off. Unexpected, sudden loss of power could cause significant injury.

**Step 3- Shut down** equipment or system to be serviced using normal stopping procedures.

**Step 4- Dissipate** or restrain stored energy:

1. Steam, air, and hydraulic piping or tanks must be bled, drained, and brought to atmospheric pressure and locked “open” to assure no pressure or vacuum in piping or in reservoir tanks.
2. Gas cylinders must be locked ‘closed’ and if possible disconnected from distribution piping.
3. Any mechanical component that could roll, shift or move, such as springs, counterweights, wheels, fan blades, etc. must be chained, barred or blocked.

**Step 5- Place locks and tags:**

Each person who will be working on the machinery must put a lock on each of the machine’s energy isolating device(s). Each lock must remain on the machine until the work is completed. Only the worker who placed the lock may remove their lock. Attach accident prevention tags, which give the reason for placing the lock and tag, the name of the person placing the lock and tag, how they may be contacted, the date, and time the lock and tag was placed.

**Step 6- Verify (tryout):**

After ensuring all personnel are clear, verify that the equipment or system is isolated by attempting to energize it. Make sure all controls are returned to the off or neutral position. Do not repeat verification of LOTO while service and maintenance is being performed. For procedures involving one person, the procedure can be verified by the person locking and tagging out the equipment or system. Group LOTO procedures must have an assigned Primary Authorized Employee to verify the procedure.

**Step 7- Returning equipment to service:**

1. Ensure all personnel are clear of the work area.
2. Ensure all tools are removed from work area.



3. Reinstall all guards.
4. Have each Authorized Employee remove their own lock and tag from all energy isolation devices.
5. Notify all Affected Employees that lockout devices have been removed, and that the system or equipment will be restarted.
6. Return the equipment or system back to normal service.

**Step 8- Maintaining lockout/tagout continuity:**

1. If a system or piece of equipment will be left unattended, in an inoperable condition at the end of a shift, or if an oncoming shift will be continuing work on the system, follow one of these methods:
  - a. A site supervisor or designated Primary Authorized Employee will facilitate lockout/tagout continuity. This must be done by replacing the departing employee's lock and tag with his or her personal lock and tag on the system until work continues. This method should be used if there will be a break in time between work shifts.
- OR
- b. Authorized Employee(s) from the oncoming shift will place personal locks and tags on the system or equipment before the departing shift removes their personal locks and tags. This method is preferred, if feasible.
2. Regardless of which method is used, The Primary Authorized Employee must verify that the equipment or system remains inoperable in a manner similar to Step 9 in the lockout/tagout procedure.
3. "Shop locks" or equipment locks with multiple keys may not be used to maintain lockout/tagout continuity.

**Step 9- Group Lockout/Tagout:**

1. Some servicing or maintenance work may involve a group or groups of employees. When more than one person is involved in a lockout/tagout procedure, group lockout/tagout procedures must be followed. Any hazardous energy control method used for a group must provide an equivalent level of protection as would the use of personal lockout/tagout devices.
2. A Primary Authorized Employee must be assigned to provide oversight for any procedure involving more than one person. The Primary Authorized Employee will:
  - a. Have overall responsibility for the servicing or maintenance of the equipment.
  - b. Verify that the LOTO procedure was completed correctly by attempting to startup the equipment or system.
  - c. Be the last person to remove his or her lockout device once the servicing or maintenance is finished.
3. Group lockout devices and lock boxes can be used to effectively isolate hazardous energy when multiple people are involved. Refer to Group lockout device and Lock boxes.

**Group lockout device:**



When an energy-isolating device for equipment or machinery cannot accept more than one lock and tag, a group lockout device, such as a hasp, may be used. Hasps should be used when lockout/tagout procedures are not complex and require only one energy source to be locked and tagged out. When using a hasp, each Authorized Employee should attach personal tags to individual locks rather than attaching them directly to the hasp device.

**Lock boxes:**

1. When energy isolation is complex and requires lockout/tagout for multiple energy sources, lock boxes are an appropriate method of energy control. Using lockboxes protects multiple Authorized Employees without having each person apply a personal lock on an energy isolation device. This is especially practical when energy isolation devices are widely dispersed, or if there are many different employers working on the same equipment or system.
2. If using a lock box, locks used for the group LOTO procedures will be designated by color, size, or shape. Once a lock box is in use, the key for the group locks will be placed in the box. The box must be secured by appropriate means. Lock boxes should be secured by the Primary Authorized Employee's lock, the locks of the Authorized Employees, or a tamper evident seal.
3. The following are requirements that must be considered when using a lockbox:
  - a. Individual assigned locks will not be placed on the equipment. Instead, locks designated for group lockouts will be used to lock out the equipment or system.
  - b. The group LOTO procedures must provide each Authorized Employee with the same level of control that he or she would be afforded in an individual LOTO scenario.
  - c. All hazardous energy sources must be isolated and controlled prior to placing individual locks and tags on group lock boxes.
  - d. There must be a Primary Authorized Employee (PAE) designated to review the LOTO procedure and ensure the procedure indicates a plan to use a lockbox. This employee will be the first person to place their lockout device on the lock box, and the last person to remove their lockout device from the lock box.
  - e. The Primary Authorized Employee must physically verify each step of the LOTO procedure and sign the form. The PAP must also tryout the equipment or system to ensure that the hazardous energy is controlled.
  - f. Between shifts, the lock box must be secured appropriately. The Primary Authorized Employee must ensure that the lock box is secured until the job is complete.
  - g. If the lock or seal on the lock box is not maintained, the entire LOTO effort must be considered failed, all work stopped and the entire LOTO process started over again.

**Corded and plug connected equipment:**

Making corded and plugged equipment safe for servicing and maintenance can be done in one of the following ways:

1. The Authorized Employees must have exclusive control of the plug when disconnected from the energy source. This is often called the "cord in hand method" and is acceptable only if any stored energy in the equipment cannot be reasonably expected to be dissipated through the plug.
- 2.



3. A lockout device can be used to prevent someone from connecting the plug to a power source.

**Hot tap operations and other energized work:**

Work on energized systems must not be done unless it is impossible to de-energize a system because it is not feasible or the service is essential. Examples are typically limited to life support systems and fire protection systems in certain circumstances.

**Running adjustments:**

Running adjustments cannot be used unless the equipment or system cannot be adjusted while it is locked out. Running adjustment procedures will be considered an alternative method to controlling the release of hazardous energy and the process must be completely documented, much the same as a routine LOTO procedure. Departments are responsible for providing the expertise for and the documentation of running adjustment procedures. In all cases, running adjustments must be routine in nature, repetitive, and integral to using the system or equipment. And in all cases, another suitable means of protection must be provided.

**Testing and positioning procedures:**

When LOTO devices must be temporarily removed from the energy-isolating device and the machine or equipment energized to test the machine or equipment, the following sequence of actions must be followed:

1. Remove personnel from the machine or equipment
2. Clear the machine or equipment of tools and materials
3. Remove the lockout and tagout devices
4. Energize and proceed with testing or positioning
5. De-energize all systems and reapply energy control measures to continue the servicing or maintenance.

**Abandoned Lock Removal:**

Under normal circumstances, the person who placed the lock is the person to remove their lock. Occasionally, this is not possible. Removal of another person's lock must follow the process of placing equipment or systems back into normal service. Departments are responsible for documenting a process for removing a lock when the lock's owner is not able to do so. An Abandoned Lock Removal Form should be used when a lock is removed in these situations.

## Specific Energy-Control Procedures

The County is developing specific energy-isolation procedures for all machines and equipment that have energy-isolating devices.

## Special Lockout/Tagout Situations

### **Energizing testing**

When an energy-isolating device is locked or tagged and it is necessary to test or position equipment, do the following:

1. Remove all unnecessary tools and materials.
2. Ensure all other employees are out of the area.
3. Remove locks or tags from energy-isolating devices.
4. Proceed with the test.
5. De-energize equipment and lockout or tagout energy-isolating devices.
6. Operate equipment controls to verify the equipment is de-energized.

### **Contract service and maintenance**

The County and its contractors must be aware of their respective lockout/tagout procedures before the contractor does onsite work. County employees must understand and comply with the contractor's energy-control procedures.

### **Group Lockout**

When more than six people are performing work/maintenance on a piece of equipment a group lockout box will be used. This box will clearly be marked as a lockout box. Each piece of equipment will have its own lock and each key will be placed in the box, and then closed. Once closed, employees will affix their locks to the lid of the group lockout box.

### **Shift changes and long-term shutdowns**

Employees must follow County specific written procedures when it is necessary to continue lockout/tagout when work shifts change and during long-term shutdowns. The Supervisor are responsible for monitoring their respective department's lockout and tagout devices that control the energy to equipment during long-term shutdowns.

## Alternative Methods

When lockout or tagout is *not* used for tasks that are routine, repetitive, and integral to the production process, or prohibits the completion of those tasks, then an alternative method must be used to control hazardous energy.

Selection of an alternative control method must be based on a risk assessment of the machine, equipment, or process. The risk assessment must consider existing safeguards provided with the machine, equipment or process that may need to be removed or modified to perform a given task.

For example, when control circuits are used as part of the safeguarding system, the system must be designed to ensure protection as effective as a mechanical disconnect switch or master shut-off valve. A control-reliable dual channel hardwired circuit of industrially rated components that satisfies the design features as specified in ANSI B11.19, with a safety relay or safety PLC to ensure integrity and performance of the safeguarding system, must be used.



Under all circumstances, the individual must have exclusive personal control over the means to maintain the state of the control circuit in a protective mode.

## Training

Employees who may be exposed to hazardous energy will receive training before assignments to ensure they understand the County's energy-control policy and have the necessary skills to apply, use, and remove energy controls. Training will include the requirements of 1910.147 and the following:

- Affected employees will be trained in the purpose and use of energy-control procedures. An affected employee uses equipment that is being serviced under lockout or tagout procedures or works in an area where equipment is being serviced.
- Authorized employees will be trained to recognize hazardous energy sources, the type and magnitude of energy in the workplace, the methods and means necessary for isolating and controlling energy, and the means to verify that the energy is controlled. An authorized employee locks out or tags out equipment to perform service work. An affected employee becomes an authorized employee when that employee's duties include service or maintenance work on equipment.
- Employees whose jobs are in areas where energy-control procedures are used will be trained about the procedures and the prohibition against starting machines that are locked or tagged out.
- Employees will be retrained annually to ensure they understand energy-control policy and procedures.
- Authorized and affected employees will be retrained whenever their job assignments change, energy-control procedures change, equipment or work processes present new hazards, or when they do not follow energy-control procedures.

Current training records will be maintained for each authorized and affected employee, including the employee's name and training date.

## Inspections of Written Energy-Control Procedures

The County will perform and document annual inspections of energy-control procedures to ensure that employees understand and use them effectively. Documentation will include the following:

- The equipment on which the procedure is used.
- Date of the inspection.
- Employees participating in the inspection.
- The inspector.

If an inspector finds that employees are not following an energy-control procedure or that the procedure is not protecting them, employees must be retrained and the procedure's deficiencies corrected.

The inspector must understand the procedure and must be someone other than those following the procedure at the time of the inspection.



Each procedure's accuracy, completeness, and effectiveness must be verified.

If the inspection covers a procedure for equipment with an energy-isolating device that can be *locked out*, the inspector must review the procedure with the employees who use it to service the equipment. The inspector can review the procedure with the employees individually or in a group.

If the inspection covers a procedure for equipment with an energy-isolating device that can only be *tagged out*, the inspector must review the procedure with the authorized employees who service the equipment and with affected employees who may work in the area when the equipment is serviced. The inspector can review the procedure with the employees individually or in a group.