



Lockout-Tagout Procedures

Reviewed May 23, 2007



DRAFT

Table of Contents

	Page #
Table of Contents	2
I. Purpose	3.
II. Scope	3
III. Policy Statement	3
IV. Definitions	3
V. Lockout/Tagout Procedures	4
VI. Non-Department Personnel	5
VII. Group Lockout/Tagout	6
VIII. Shift Change Procedures	6
IX. Periodic Inspections	7
X. Training Requirements	7
Appendix A Definitions	8
Sample Lockout/Tagout Procedures	9

I. Purpose

NDOR's mission is to prevent accidents from the accidental release of stored up energy when performing maintenance, servicing or repairing equipment and machines when the possibility that accidental release of stored energy can cause injury or death.

II. SCOPE

This departmental program applies to the service, maintenance and repair of all equipment and machines with the following exceptions:

1. Work on a plug or cord type electrical devices provided they have been unplugged from the receptacle and the plug is in the exclusive control of the employee who is performing the servicing or maintenance of that equipment (i.e. portable tools, shop equipment with a plug).
2. Hot tap operations, involving substances such as steam where operations are performed on pressurized lines, provided the employer demonstrates that the continuity of service is essential, shutdown is impractical, and documented procedures and special equipment are used that provide effective protection (i.e. steam lines).
3. Normal production operations (i.e. assembly line operation which must remain in operation).
4. Servicing or maintenance during normal production operations if it is necessary to perform these operations while the equipment or machine is energized and alternative procedures are used to provide effective protection (i.e. lubricating a fan that must remain in operation, provided that guards are in place).

III. Policy statement

All NDOR employees are required to follow LOTO guidelines where the unexpected energization, start-up or release of stored energy could cause injury. All visitors to NDOR facilities must comply with this program or will be denied access to the affected areas.

IV. Definitions

- A. **Affected employee:** An employee who operates, or is in the vicinity of, machinery or equipment that is subject to LOTO procedures.
- B. **Authorized employee:** An employee who is trained to perform specific LOTO assignments.
- C. **Energized:** Connected to an energy source or containing residual or stored energy.
- D. **Energy Isolating Device:** Device that physically prevents the transmission of energy.
- E. **Hot Tap:** A procedure used in repair, maintenance and service activities which involve welding or cutting on a piece of equipment (pipelines vessels, or tanks) under pressure, in order to install connections or parts.
- F. **Lockout device:** Device that utilizes a lock and key to hold an energizing device in place.
- G. **Tagout device:** A Prominent warning device, such as a tag and means of attachment, capable of being securely attached to an energy isolating device.

H. **Service and/or Maintenance:** Any function that include workplace activities, such as installing, constructing, adjusting, setting up, inspecting and maintaining or repairing machines or equipment.

V. Lockout/ Tagout procedures

A. General

1. No NDOR employee or any employee under contract with the NDOR may work on exposed equipment to power driven NDOR equipment without first locking out the power source, tagging all switches where the equipment can be energized, and verifying the equipment cannot be started. LOTO procedures must be performed during maintenance or servicing of machines whenever unexpected energizing, start-up, or the release of stored energy could cause injury to the authorized employee.
2. All locks and tags shall be permanently assigned to each authorized employee. Any spare keys or master key shall be secured in a designated location by the supervisor. The name of the authorized employee, the date of the LOTO and any comments shall be affixed to the tag in such a manner that it cannot be removed or smeared during use by water or rubbing the tag.

B. Identifying Energy Types

Identify the type of energy to be isolated

1. Electrical energy locate all sources
2. Hydraulic and /or pneumatic energy look for stored up energy
3. Stored fluids or gases in pipes or valves
4. Mechanical energy
5. Gravity release

C. Accident situations

1. Accidental start-up; equipment can accidentally be turned on and any part of the body may be in the point of operation or while inside the equipment.
2. Electrical shock; you can be electrocuted if the power is on or if it's accidentally turned on.
3. Fluids or gasses can be released unexpectedly while work is being done. It can build up to dangerous levels and must be monitored if it is blocked out.
4. Stored mechanical energy; can release gears, springs etc. unexpectedly.
5. Gravity can cause movement when it is least expected.

D. Preparation for LOTO;

Make a survey to locate and identify all isolating devices to be certain which circuit breaker, switch, valve, or other energy isolating devices apply to the equipment to be locked and or tagged out. More than one type of energy source may be involved.

E. Basic rules for LOTO:

1. Lock rules; **"USE AN APPROPRIATE LOCKOUT DEVICE"** such as a **Padlock**, or **LOCKOUT TAG**.
2. Identify locks; each lock will be identified by a number or name of the individual that owns the lock. Locks without tags are unacceptable. Additional information that identifies the person or persons performing the work must be on the tag. The type of work being done must also be identified on the tag.
3. Sign the tag; one tag may not be sufficient, however the tag must be signed by each Authorized worker. In some instances the supervisor may have to sign the tag.
4. One key per lock; the key can't fit any other lock used in the workplace. The lock must be different than the other locks. This can be identified by different colors or types.

5. The owner of the lock will never give the key to anyone else to unlock the locking device.

F. Basic Lockout Tag out procedures

1. Prepare for shutdown. Know what type of energy the machine uses. Identify and document the potential hazards. Find all the switches, valves, or other devices that control energy and will need to be locked out.
2. Notify affected employees that you will be locking out or tagging out the equipment and the reason why.
3. Turn off the machine or equipment; locate all the switches that affect the machine or equipment. If it is key operated remove the key and tag it or put it in your pocket so only you control it.
4. Locate and isolate all energy sources, get rid of any stored energy, as in springs, hydraulic systems or air pressure. You may want to block, bleed, Vent, etc. to be sure there's nothing left to move a machine part. The force of gravity can cause a hydraulic or air pressure to fail.
5. Lock out switches or other energy controls. Attach a lock that holds them in the off position.
6. Test the operating controls. Be sure no one is close enough to get hurt. Put all the controls in the on position. Make sure the power doesn't go on and the equipment won't operate.
7. Put the operating controls back to the "off" or safe position.
8. Test the circuits and electrical parts, make sure blocking is secured and can't be accidentally removed. Pressure in the hydraulics and air pressure is released and won't cause unexpected movement.
9. Perform the necessary service or maintenance.

G. ZERO energy start up, restoring the equipment to normal operation. Starting the equipment is just as important as LOTO in terms of safety.

H. Start-up

1. **Inspect;** the work area must be inspected to ensure the machine or equipment components are operationally intact and that all tools and repair equipment have been removed from the area or safely positioned.
2. **Clean up;** all materials and debris must be cleaned up. All affected employees are removed from the area and are safely positioned.
3. **Replace guards;** replace all guards to the equipment. If adjustments can not be made with the guard on after start-up, leave off only the ones to be adjusted after start-up "OFF" position.
4. **Check controls;** Check that all switches are in the off position. In some cases the machine can start automatically when the energy is restored.
5. **Remove locks;** locks and tags must be removed by the person/s who installed them. If the person who applied the lock is not available to remove it, the device may be removed only in an emergency situation and if the following steps are adhered to.
6. **Before lock removal;**
 - a. Only a department head or designee may approve the removal of Lockout or tagout devices.
 - b. An attempt must be made to contact the authorized employee who applied the lockout or tag device. Verify that whoever applied the lockout/tagout device is not on the premises.

After removal;

 - a. A reasonable effort must be made to contact the authorized employee to inform that their lockout/tagout device has been removed.
 - b. The individual who approves of the removal of the lockout/tagout

device must ensure that the authorized employee knows that his lockout/tagout device has been removed before he/she resumes work.

c. Visual checks.

Documentation is required and shall be maintained to certify that periodic inspections have been performed. The documentation will identify the machine or equipment on which the energy control procedures was being utilized, the inspection date, the employees included in the inspection, and the person performing the inspection.

V. Non-Departmental Personnel (Contractors, etc.)

Whenever non-Departmental personnel are to be engaged in activities covered by the scope and application of this policy, the following procedures must be followed.

A. Representatives of the NDOR and non-Department personnel must inform each other of the respective lockout/tagout procedure to use.

B. Departmental supervisors will insure that Lockout /Tagout procedures used by contractors are compatible with NDOR procedures and complied with by NDOR employees.

VII. Group Lockout/Tagout

If more than one authorized employee is working on the same machine or equipment, each employee who may be endangered during the operation must use a personal lock and tag on the energy isolating device to ensure his safety. When an energy isolating device cannot accept multiple locks and tag out device (hasp) may be used. (Example: When an energy isolating device was not originally designed to accept multiple locks and tags). A primary authorized employee must assume responsibility for the protection of all employees protected by group lockout/tagout. As each person completes his task and therefore no longer needs his LOTO protection, that person will remove his lock and tag.

VIII. Shift/Personnel Changes

Whenever there are shift/personnel changes involved, there must be an orderly transfer of LOTO devices and controls. A primary authorized employee from each shift/personnel crew must assume responsibility for the protection of all employees. The lockout device must stay in place during the shift/personnel change. As each person completes his task and therefore no longer need to maintain lockout protection, that person will remove his lock and tag. The last employee being the primary authorized employee does not remove his lock and tag until the primary authorized employee of the oncoming shift locks and tags the energy isolating device.

IX. Periodic Inspections

- A. Periodic inspections must be conducted by the supervisor or designee at least annually to insure that the proper LOTO procedures are being followed.
- B. These periodic inspections must be conducted by someone other than the person/s using these procedures.
- C. The inspections shall include a review, between the supervisor and each authorized employee, of those employees' responsibilities under the energy control procedure being inspected.

X. Training requirements

A. No employee is allowed to service or repair machines or equipment where the unexpected energization, start-up or release of stored energy could cause injury unless he has completed the Lockout/Tagout Training program.

B. Training programs

Training must be provided to insure that the purpose and procedures of this policy are understood.

1. Authorized employees (those who will apply locks and tags) must be trained in the recognition of hazards and the proper use of lockout/tagout devices.
2. All other affected employees must be trained in the purpose of energy control procedures and the recognition of LOTO devices.
3. Periodic retraining must be conducted whenever inspections indicate that there are inadequacies or deviation in the program.
4. Supervisors or designee will provide training for authorized employees in their respective areas.
5. Documentation will be kept by the supervisor on specific equipment Lockout/Tagout procedures and the training

DRAFT

Appendix A.

Minimum requirements for Lockout/Tagout devices

Locks and hasps

1. Instantly identifiable as equipment to be used in the NDOR Lockout/Tagout program and shall not be used for any other purpose.
2. Standardized within the facility in at least one of the following criteria: Color, Shape or size.
3. Substantial enough to prevent removal without the use of excessive force or unusual techniques, such as the use of bolt cutters or other metal cutting tool.
4. Capable of withstanding the environment to which they are exposed.

Examples of :



Locks and Hasps



Tags

1. Instantly identifiable as equipment to be used in the NDOR Lockout/Tagout program and shall not be used for any other purpose.
2. Standardized in at least one of the following criteria: Color, shape or size.
3. Constructed and printed so that exposure to weather conditions or wet and damp locations will not cause the tag to deteriorate or the message to become illegible.
4. Not subject to deterioration when in corrosive environments, such as areas where acid or alkali chemicals are handled and stored.
5. Substantial enough to prevent inadvertent or accidental removal.
6. Tag device attachment means shall be of a non-reusable type, attachable by hand, self locking, and non-releasable with the minimum unlocking strength of no less than 50 pounds and having the general design and basic characteristics of being at least equivalent to a one –piece, all-environment-tolerant nylon cable tie.
7. Tag message shall warn of a possibly hazardous condition if the machine or equipment is energized and shall include a legend such as: **DO NOT OERATE**".

Examples of:



Tags



NDOR Sample: Tag out procedure for vehicles under repairs.

- I. Purpose: To be specific on the methods to **TAGOUT** vehicles under repair in the shop. And to prevent injury or equipment damage.
- II. This procedure is a supplement to the Lockout/Tagout policy the Department has adopted July 27, 2006 for vehicle repair or service.
- III. Procedures to be used are the tag out process for General Vehicle Servicing and repairs as stated in the policy.
 - A. Process Shut Down: Determine what repairs are to be done and complete the proper Equipment Repair Order DR form 510 and the DR form 116 Pre Trip Inspection form if needed.
 - B. Accidental start-up of a vehicle under repair could injure a employee and/or damage NDOR equipment and property.
 - C. Authorized mechanic will start the LOTO process as follows:
 1. Place lockout Tag with the vehicles key on the steering wheel with a nylon cable tie that is rated for a minimum of 50 pounds of pull to remove. To remove the tag the nylon cable must be cut off and it can't be reused.
 2. Have all authorized mechanics/supervisor that will be working on the equipment place their personal Lockout Tag on the vehicle.
 3. All affected employees are to be notified that repairs will be performed and that the vehicle has been tagged and is not to be used for any purpose.
 4. When the work is completed the authorized mechanic will inspect the vehicle prior to start up. All tools, old parts and testing equipment will be moved to a safe area.
 5. The Authorized mechanic will remove the tag.
 6. Only the authorized mechanic/s that placed their tag/s on the equipment can remove it.
 7. If the vehicle has to be started by another employee, the supervisor must first be notified and the mechanic that owns the tag must be notified.
 8. If the mechanic is not available and is not on the premises the supervisor can in an emergency authorize perform the start-up procedures.
 9. The supervisor must notify the authorized mechanic/s responsible for LOTO when he/she reports to work that his/her tag was removed.
 10. The supervisor must document that the inspection and proper tagout procedures were followed according to the policy.
- IV. Outside vendors working on equipment must have a procedure equal to or more stringent Lockout/Tagout then the Department before work is allowed to be performed.
- V. Supervisors are responsible to oversee the Lockout/Tagout procedures are written and adhered to for each piece of machinery. Supervisors or designee are responsible for the training and inspection of the LOTO process. Inspections of the process are to be performed at least annually.