



THE UNIVERSITY OF SOUTHERN MAINE

**Lock-out Tag-out Program
(Zero Mechanical State)**

TABLE OF CONTENTS

Section	Title	Page
1.0	Scope and Responsibilities.....	3
2.0	Examples of Potential Energy and Zero Mechanical State.....	4
3.0	Who is Covered by this Program.....	5
4.0	Lockout Tagout Procedures.....	5
5.0	Locks Removal Rule.....	7
6.0	Responsibility at the End of a Work-Shift.....	7
7.0	Group LOTO.....	8
8.0	Training.....	9
9.0	Record Keeping.....	10
10.0	Annual Inspections.....	10
Appendix		
A	Equipment Specific LO/TO Procedures Example & Form	11
B	LO/TO of Simple Electrical Equipment or Machinery	13
C	General LO/TO Procedure for Plug Connected Electrical Equipment	14
D	General LO/TO Procedure for Motor Vehicle and Powered Industrial Equipment	15
E	Annual LO/TO Self-Audit Form	17
F	Extended Shift Form	20
G	Daily LO/TO Activity Form	21

Issued By: University Environmental Health and Safety

Effective Date: June 6, 1990

Revision Date: September 1999, August 2003, April 2004, January 2010, May 2011, February 2013

POLICY:

USM LOCK-OUT TAG-OUT PROGRAM

Statement of Purpose:

This program is intended to preserve the safety of those individuals involved with servicing or maintenance of equipment or machinery. Department's must ensure that anyone performing servicing or maintenance activities are conducting these duties in a safe manner, utilizing lock-out tag-out guidelines. LOTO should also be thought of as rendering something to a Zero Mechanical State (ZMS), as LOTO is not just concerned with electricity.

1.0 Scope and Responsibilities

The following departments have the following responsibilities:

1. University Environmental Health & Safety: Provide guidance to supervisors on how to implement LOTO/ZMS procedures. University Environmental Health & Safety will offer LOTO awareness training for employees to fulfill their responsibilities under the LOTO program and perform periodic audits of the LOTO program.
2. Directors & Department Heads: Deans, Directors, and Department Heads are responsible for ensuring that specific LOTO/ZMS procedures are developed for those pieces of equipment or machines that are not covered by Appendix B, C, and D that are serviced by their employees.

Each department is required to perform an annual self-audit of the LOTO/ZMS procedures utilized within their department.

3. Supervisors: Supervisors who have employees engage in servicing or maintenance of machines or equipment shall ensure that employees follow LOTO/ZMS procedures, as outlined in Appendices B-D and/or (Appendix A) specific LOTO/ZMS procedures developed by the department performing the servicing or maintenance.

Supervisors must provide LOTO awareness training during annual departmental training for all non-authorized employees and students who are in the area when LOTO activities occur.

Supervisors shall be responsible for ensuring that their employees/students receive Authorized Employee LOTO/ZMS Training where required. In addition, the supervisor shall ensure that all

Authorized Employees are trained on each Equipment Specific LOTO Procedure that the Authorized Employees are required to perform for their department.

4. Employees: Employees who perform servicing or maintenance on machines or equipment may only perform work for which they have been specifically authorized by their supervisor. Employees who perform LOTO/ZMS of equipment are required to attend training and follow General or Equipment Specific Lockout/Tagout Procedures, as appropriate.
5. Students: Students who performed tasks that require LOTO/ZMS must be specifically authorized by their instructor and supervised by a competent person to ensure compliance with all of the requirements of the program.
6. Contractors: An outside contractor must have a LOTO/ZMS program in place prior to starting work that requires LOTO activities at USM.

2.0 Examples of Potential Energy and Zero Mechanical State

Energy Form	Energy Source	General Guidelines
Electricity	<ul style="list-style-type: none"> Power transmission Machine power cords Motors Solenoids Capacitors (stored electrical energy) Generators Batteries Photovoltaic Arrays 	<ul style="list-style-type: none"> Turn off power at machine first or point of operation switch & then at main disconnect switch for the machine. Lock and tag the main disconnect switch or remove fuses from box. Then lock and tag the box. Fully discharge all capacitive systems. For example, cycle machines to drain power from capacitors. Install grounds where necessary. Bump test when appropriate.
Fluid Pressure	<ul style="list-style-type: none"> Hydraulic systems including hydraulic presses, rams, cylinders or hammers 	<ul style="list-style-type: none"> Shut off, lock with chains, built-in lockout devices or lockout attachments and tag valves. Bleed off and blank lines as necessary.
Air Pressure	<ul style="list-style-type: none"> Pneumatic systems including lines, pressure reservoirs, accumulators air surge tanks, rams and cylinders. Air actuated valves. 	<ul style="list-style-type: none"> Shut off, lock with chains, built-in lockout devices or lockout attachments and tag valves. Then bleed-off excess air. If pressure cannot be relieved, block any possible movement of the machinery.
Kinetic Energy	<ul style="list-style-type: none"> Blades Flywheels Materials in supply lines of bins or silos 	<ul style="list-style-type: none"> Stop and block machine parts and ensure that they do not recycle. Review the entire cycle of mechanical motion and ensure that all motions are stopped. Block material from moving into an area of work and blank as required.
Potential Energy	<ul style="list-style-type: none"> Springs Actuators Counterweights Raised loads Top or moveable part of a press or lifting device 	<ul style="list-style-type: none"> If possible, lower all suspended parts and loads to the lowest or rest position. Block parts and might move due to gravity, release or block stored spring energy.

Pressurized liquids and gases including steam and chemicals	<ul style="list-style-type: none">• Supply lines• Storage tanks and vessels	<ul style="list-style-type: none">• Shut off with chains, built-in lockout devices or lockout attachments and valves. Bleed-off excess liquids or gases and blank the lines as necessary.
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1. Hazardous materials may require a double-block and bleed. These requirements must be noted in the department specific LOTO/ZMS procedures.
2. The Lock-out Tag-out program (LOTO) will be considered complete when your department has developed and implemented any specific procedures needed to render equipment safe for your employees to perform maintenance and service work. Specific procedures will be needed for equipment or machinery not covered by appendix B, C, or D. The specific procedures are to be added to your department copy of this program, as part of Appendix A.
3. Individuals performing diagnostic work on energized-circuits must follow other applicable safety protocols such as techniques used in the onsite appliance repair industry.
4. To prevent tampering with LOTO devices machinery or equipment, locks and tags with the name of the employee that placed the locking device must be used.
5. A *qualified person* or employee is a person who has sufficient training and experience to safely work on specific energized conductors. A person who designs LOTO/ZMS procedures must also be electrically qualified.

3.0 Who is Covered by This Program

1. Any USM employee/student engaged in maintenance or servicing work on machinery or equipment where unexpected energizing or start-up of the machinery or equipment, or release of stored energy, could result in serious injury, death, or property damage or whom conducts activities in an area where LOTO occurs.
2. Potentially hazardous energy sources include, but are not limited to; electricity, hydraulic, kinetic, steam, pneumatics, and gravity. Day to day or routine maintenance activities, research projects, as well as renovation or construction projects may involve the potential exposure to potentially hazardous energy sources. It is an objective of UEH&S to control and eliminate the potential risk involved with servicing or maintenance activities by implementing the LOTO/ZMS program.
3. Servicing or maintenance work which takes place during normal production operations (such as oiling a gear via an oil lube port) is not covered by this program unless:
 - a. An individual is required to remove or bypass a guard or other safety device; or
 - b. An employee is required to place any part of their 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 where an associated danger zone exists during a machine operating cycle (such as moving gears, chains, etc).

4.0 Lockout Tagout Procedures

The following procedures are to be followed by all employees involved in the servicing or maintenance of machinery, requiring the use of LOTO/ZMS procedures:

1. Preparatory Procedures: The following procedures are to be performed prior to servicing or maintaining equipment or machinery covered by this program:

- a) Notify all affected employees that servicing or maintenance is required, that the machine or equipment must be shut down and locked out to perform the servicing or maintenance, not to attempt to remove the lockout device, and not try to start the machine or equipment.
 - b) Ensure that all of the tools and equipment necessary for you to perform the servicing and/or maintenance have been obtained.
 - c) Shut down the piece of equipment or machinery using the established procedures.
2. General Lockout/Tagout Procedures: Simple Electrical Equipment or Machinery (Appendix B): If the piece of equipment or machinery meets the following criteria, an Authorized Employee may implement this general LOTO procedure:
 - a) Has no potential for stored or residual energy or re-accumulation of stored energy after shutdown, which could endanger employees;
 - b) Has a single energy source that can be easily identified and isolated;
 - c) Isolating and locking out of that energy source will be completely de-energized/deactivate the machine or equipment;
 - d) Is isolated from that energy source and locked out during servicing or maintenance;
 - e) A single lockout device will achieve a locked-out condition; and,
 - f) The lockout device is under the exclusive control of the authorized employee performing the work and it may not be used, shared or removed by other employees.
3. General Lockout/Tagout Procedures: Plug Connected Electrical Equipment (Appendix C): In order for an Authorized Employee to implement this general LOTO procedure, the piece of equipment or machine must meet the following criteria:
 - a) The machine or equipment has no potential for stored or residual energy or re-accumulation of stored energy after shutdown, which could endanger employees.
 - b) The machine or equipment has a single energy source that is powered from a cord and plug.
4. General Lockout/Tagout Procedures: Motor Vehicle & Powered Industrial Equipment (Appendix D): An Authorized Employee may implement this general LOTO procedure when servicing a motor vehicle or powered industrial equipment.
5. Equipment Specific Lockout/Tagout Procedures: When a piece of equipment requires servicing or maintenance, but does not meet the criteria for Appendices B, C or D, then an Equipment Specific LOTO/ZMS procedure must be developed and filed under Appendix A of the USM LOTO Program. An Equipment Specific LOTO/ZMS Procedure must contain the following details:
 - a) A specific statement of the intended use of the procedure;
 - b) Specific steps for shutting down, isolating, blocking and securing machines or equipment to control hazardous energy;
 - c) Specific procedural steps for the placement and removal of LOTO devices and the authorized employee's responsibility for them; and
 - d) Specific requirements of testing a machine or equipment to determine and verify the effectiveness of LOTO devices, and other energy control devices (ZMS).
6. A qualified employee, as defined in the University of Southern Maine Electrical Safety Policy, is required to review all Equipment Specific Lockout / Tagout Procedures that include specific steps for isolating and de-energizing and electrical energy source(s). A qualified person or employee is a person

who has sufficient training and experience to safely work on specific energized conductors. A person who designs LOTO/ZMS procedures must also be electrically qualified.

7. Releasing Equipment or Machinery from LOTO/ZMS: When servicing or maintenance is completed and the equipment or machinery is ready to be released from LOTO, the following steps, in sequence, shall be taken by the employee who performed the lockout:
 - a) Check the machine and the immediate area around the machine to ensure that non-essential items have been removed and that the machine guards and other components are operationally intact;
 - b) Check the machines and the immediate area around the machine to ensure that non-essential items have been removed and that the machine guards and other components are operationally intact;
 - c) Check the work area to ensure that all employees have been safely positioned or removed from the area. Notify them that the machine or equipment is going to be released from LOTO;
 - d) Verify machine controls are in neutral or off position;
 - e) Removed lockout devices and re-energize the machines or equipment; and,
 - f) Notify affected employees that servicing or maintenance is completed and the machine or equipment is ready for use.
 - g) Note the finish date and time in the appropriate daily or overnight activity form.
 - h) The tags may be reused by cleaning with isopropyl alcohol. Discard any tags that are damaged or beyond reuse.
8. Alternative Procedures: When LOTO locks cannot be used, alternative procedures must be developed. These alternative procedures must be reviewed by the Supervisor and UEH&S prior to implementing.

5.0 Lock Removal Rule

LOTO locks shall not be removed by anyone but the employees who placed the lock, unless the procedures outlined below are needed and followed. Removing a LOTO device, belonging to someone else, could result in fatality or serious injury.

If the person who applied a LOTO device is not available to remove the device in a timely manner, the device may be removed by the authorized employee's supervisor after the following procedures have been followed:

1. The supervisor must verify that the authorized employee who applied the device is not available;
2. The supervisor shall ensure that servicing or maintenance has been completed prior to releasing the machine or equipment from LOTO, and procedures for releasing a piece of equipment or machinery from LOTO are followed;
3. The supervisor must ensure the authorized employee (who placed the lock) knows that the device has been removed before other employees engages in their work duties;
4. Verification by the employer that the authorized employee who applied the device is not at the facility;
5. Making all reasonable efforts to contact the authorized employee to inform them that their LOTO device has been removed;
6. Ensuring that the authorized employee has this knowledge before they resume work in that area or department; and,
7. The reason for the lock removal must be documented and maintained for one year.

6.0 Responsibility at the End of a Work-Shift

Individuals not completing the servicing or maintenance of equipment or machines that they have Locked-Out by the end of their workday shall:

1. Leave their attached locks until they complete their maintenance or servicing; and,
2. If another shift will be continuing the maintenance or service work, the authorized individuals from the on-coming and off-going shifts will transfer responsibilities from the off-going to the on-coming shift. The off-going shift will remove their lock and the on-coming shift will install their own lock and tags in accordance with the lockout procedures.
3. **Notification to Police and Safety of Extended Shift** form shall be used whenever equipment and/or systems are locked out for extended periods of time (overnight or multiple days). **See appendix F**
 - a. The form documents the particular equipment/system, location, start date /time, finish date/time, and technician performing LO/TO on equipment.

7.0 Group LOTO

When equipment, machine maintenance or servicing is provided by individuals of more than one job class (i.e. plumbers and electricians), a procedure shall be used that protects all individuals performing maintenance or servicing. This is accomplished by providing all job classes with a lock which they control. All locks are secured to a multiple hold lockout hasp. The hasp is attached to the equipment or machine cutoff switch, valve or combination of both. Those employees assigned (by their co-workers) to control a lock have the same responsibility as if they were performing the LOTO by themselves. Lock placement and removal shall be coordinated between the differing job classes.

Group LOTO Guidance:

This guidance provides a sample policy template for group lock-out tag-out procedures.

1. Whenever a group of people perform LOTO work the Group LOTO procedure should provide the same level of protection as if only one person is performing the work.
2. A lockout hasp should be used to allow each person to affix a lockout device to the energy isolating device.
3. If two groups or more are involved, a coordinator shall be appointed to coordinate the work. A group lock box may be used.
4. Once all energy sources have been isolated, residual energy released and locked out, all of the keys to the locks are placed in the group lockbox and the coordinator or supervisor would then apply their lock on the group lock box.
5. All group-lockout must be performed under the direction of an assigned or authorized employee as designated by the manager or supervisor. The primary responsibility is to oversee the group lockout.
6. Each authorized employee involved in the group lockout shall affix a personal lockout device to the group lockout device at the beginning of their work shift. The lockout devices are removed when work on the machine or equipment is completed.

7. During a shift change the authorized employee with the primary responsibilities of the group lockout will coordinate the orderly transfer of lockout devices so that continuity of protection between off-going and oncoming employees is maintained.
8. When more than one crew or group is involved, an authorized employee shall be designated to coordinate the work forces and ensure continuous protection.

Where there are several lockout points to be secured and several authorized employees involved in the project, group LOTO department specific written procedures must be in place and the following suggestions are made:

1. The primary trade or department obtains a lock box and secures it to the machine or piece of equipment.
2. Lockbox locks and tags are applied to all lockout points by the Authorized Employee from the primary trade or department.
3. The keys are collected, verified and placed inside the lock box.
4. The lock box is then closed and a multi-lock hasp is affixed to it. This will allow for additional locks to be added.
5. The last available hole should never be used for a lock. It should remain open to add another multi-lock hasp, if needed, to create more space. (As many locks as needed for the task can be added to the equipment.)
6. Each worker then applies their personal lock to the multi-lock hasp such that the box cannot be opened until each personal lock is removed. Each of the workers personal lock remains in place as long as they are actively working on the locked out equipment or machinery.
7. In all cases, the last lock to be removed should be that of the person supervising the lockout. This responsibility should not be delegated to another person.

Before implementing a group lockout, a knowledgeable person, such as the primary trade or supervisor must plan the procedure ahead of time and develop a written group lockout procedure. The written procedure must be conspicuously posted at the place where the system is in use. The plan can be in the form of a checklist or a simple bullet-item listing of the course of action for the group procedure.

8.0 Training

Workers who are to perform LOTO procedures are to receive training prior to engaging in their work. This training is to be performed by authorized individuals in their departments. UEH&S will authorize department trainers for LOTO training, and provide LOTO awareness training (as per 1910.147 (7) (i) [B]). The training is to ensure that the purpose and function of the LOTO program is understood. The supervisor will also ensure that the employees have acquired the knowledge and skill required for safe application, use and removal of lockout devices, prior to having authorized employees perform Lockout procedures.

Initial training shall include at least the following:

1. Preparatory LOTO/ZMS procedures;
2. Recognition of hazardous energy sources, the magnitude of the available energy and the methods and means necessary for isolation and control of the available energy;
3. Releasing equipment or machinery from LOTO/ZMS procedures; and,
4. Reviewing the Equipment Specific LOTO Procedures (provided by the Department Authorized LOTO Trainer/supervisor).

Re-training shall be provided:

1. Whenever there is a change in job assignments, change in machines, equipment or process, or whenever there is a change in the LOTO procedures;
2. Whenever employees are unfamiliar with LOTO procedures, or appear to have inadequate knowledge concerning what is required by this program, then the employee shall be re-trained prior to servicing or maintaining the machine or equipment; and,
3. When the department supervisor believes that an employee is in need of the training.
4. Training shall be documented by each department. The documentation should include:
 - a. Subject of training;
 - b. Date of training;
 - c. Employees' name;
 - d. Name of supervisor providing the training; and
 - e. Periodic Program Review Evaluation Information (See Section 10.0).

9.0 Record Keeping

Each department shall maintain records of the following:

1. A copy of this program;
2. Specific LOTO/ZMS procedures for equipment and machinery (found in their department);
3. Training records;
4. Corrective actions taken to address employees found violating the LOTO/ZMS program.
5. This documentation shall be reviewed annually by department and updated as new equipment or procedures are added.

10.0 Annual Inspections

1. Each department shall perform an annual self-audit of the Equipment Specific, Simple Electrical, and Motor Vehicle and Powered Industrial Equipment LOTO procedures used by their department.
2. The self-audit is intended to improve the LOTO procedures and to correct or improve any inadequacies.
3. Self-audits must include a visual evaluation of those workers performing the lockout procedures, and are to be performed by an authorized employee who does not use the LOTO procedure(s) being evaluated.
4. Annual self-audits are to be documented using the annual LOTO Self-audit Form located in Appendix E of the USM LOTO Program.
5. Completed self-audit forms shall be kept on file for a minimum of two years.

Appendix A Equipment Specific Lockout / Tagout Procedures Example

An Equipment Specific LOTO Procedure shall clearly and specifically outline the scope, purpose, authorization, rules, and techniques to be utilized for the control of hazardous energy. The following four items must be included in each Equipment Specific LOTO procedure:

1. A specific statement of the intended use of the procedure;
2. Specific step for shutting down, isolating, blocking and securing machines or equipment to control hazardous energy;
3. Specific procedural steps for the placement and removal of lockout and tagout devices and the authorized employee's responsibility for them; and
4. Specific requirements for testing a machine or equipment to determine and verify the effectiveness of lockout devices, tagout devices, and other energy control devices.

Example: **#1 Waste Water Treatment Pump**

Machine or Equipment Type: #3 Effluent Pump

Location: Basement Main Facility- Treatment ID # 003

Date Procedure Created 12/09/08 Verified By any authorized person

Date Verified 12/12/08

1. Notify all affected employees in the area:
Plant Operator and personnel in the area.
2. Proper Shutdown Procedure:
 - a. Push "Stop" button in Control Room labeled "#3 Effluent Pump"
3. Isolation of Power Sources:

Energy Type	Isolating Device	Location	Procedure
440 volt Electric	Breaker Labeled "C-5"	MCC 1 st Floor	Pull disconnect to the "Open"(Off) position and place personal lockout on handle.
Effluent Flow 8 PSI	Inlet valve "Yellow"	Right side of Pump #3.	Close by turning "Clock wise" apply Chain and apply tag and lock.
Effluent Flow 14 PSI	Outlet valve "Red"	Left side of Pump #3.	Close by turning "Clock wise" apply Chain and apply tag and lock.

4. Bleeding of Potential Energy

Energy	Bleed Down Points	Procedure
Effluent Water	Drain cock on volute.	Open and drain

5. Blocking of Potential Mechanical Energy

Hazard	Equipment Needed	Placement Safety Devices
None		

6. Verification Test

Lockout to Verify	Controls to try:	Process to verify Lockout
Electrical	Control Room "Stop" "Start"	Push "Start" button in Control Room labeled #3 Effluent Pump, back to "Off"

All controls must be returned to the "Off" position after the "Verification Test" process.

Equipment/Task Specific Lockout Procedure Form

Machine or Equipment Type: _____

Location: _____ ID # _____

Date Procedure Created _____ Verified By _____

Date Verified _____

1. Notify all affected employees in the area:

2. Proper Shutdown Procedure:

3. Isolation of Hazardous Energies

Note: This form can be compressed (rows deleted) or expanded (rows added) as the specific procedure demands.

Energy Type	Isolating Device	Location	Procedure

4. Bleeding of Potential Energy:

Energy Type	Bleed Down Points	Procedure

5. Blocking of Potential Mechanical Energy

Energy	Equipment Needed	Placement of Safety Devices

6. Verification Test

Lockout to Verify	Controls to try:	Process to verify Lockout

All controls must be returned to the "Off" position after the "Verification Test"

Appendix B

Lockout / Tagout of Simple Electrical Equipment or Machinery

Lockout may be performed following the procedures outlined below, for electrical equipment or machinery meeting the following criteria:

1. The machine or equipment has not potential for stored or residual energy or re-accumulation of stored energy after shutdown, which could endanger employees.
2. The machine or equipment has a single energy source that can easily be identified and isolated.
3. The isolation and locking out of that energy source will completely de-energize and deactivate the machine or equipment.
4. The machine or equipment is isolated from that energy source and locked out during servicing or maintenance.
5. A single lockout device will achieve a locked-out condition.
6. The lockout device is under the exclusive control of the authorized employee performing the servicing or maintenance and may not be used, shared, or removed by other employees.

Lockout of Simple Equipment or Machinery

General lockout procedures for simple machines or equipment are as follows:

1. Notify all affected employees that servicing or maintenance is required and that the machine or equipment must be shut down and locked out to perform the servicing or maintenance, and not to attempt to remove the lock or start the machine or equipment.
2. Ensure that all of the tools and equipment necessary for you to perform the servicing and/or maintenance have been obtained.
3. If the machine or equipment is in operation, shut it down by following operating procedure (e.g. depress stop butte, open switch, etc).
4. Isolate the energy source by securing a lock on the disconnect device (cut-off or breaker switch) used isolate equipment on which work is to be performed. Lockout energy isolating device(s), in the open position, with assigned individual locks (note: each authorized individual conducting maintenance or servicing shall ensure that the lock has their name and work phone number attached).
5. Ensure that the equipment or machinery is disconnected from the energy source(s) by first checking that no personnel are exposed, and then verify the isolation of the equipment by actuating the start button or switch. **Caution:** Ensure that the actuation device returns to neutral or “off” position after verifying the machine or equipment is isolated.
6. Perform maintenance and servicing of equipment or machinery.

Follow procedures for “Releasing Equipment or Machinery from Lockout”:

1. Check the machine and the immediate area around the machine to ensure that non-essential items have been removed and that the machine guards and other components are operationally intact
2. Check the work area to ensure that all employees have been safety positioned or removed from the area. And, notify them that the machine or equipment is going to be released from lockout.
3. Verify machine controls are in neutral or off position.
4. Remove lockout devices and re-energize the machine or equipment.
5. Notify affected employees that servicing or maintenance is completed and the machine or equipment is ready for use.

Appendix C

General Lockout / Tagout Procedure for Plug Connected Equipment

1. Plug Connected Lockout Procedure

The following procedure is appropriate when servicing equipment that can be isolated from its hazardous energy source by the lockout of a single, readily identifiable isolation device, and there is no potential for re-accumulation/residual/stored energy after the equipment has been locked out.

- The authorized employee shall inform affected employees that service or maintenance is required on the equipment and that it must be shut down, locked out, and tagged.
- If the equipment is operating, the authorized employee will shut it down following the normal shutdown procedure.
- The authorized employee will unplug the equipment and apply a clam shell type device to the plug along with their lock and tag . The tag should have the name of the employee affixing the tag, the date and time the tag was affixed, and work contact phone number .
- The authorized employee will ensure that stored or residual energy (such as that in capacitors, springs, elevated machine members, rotating flywheels, hydraulic systems, and air, gas, steam, or water pressure) is dissipated or restrained by methods such as grounding, repositioning, blocking, or bleeding down.
- After confirming that no one is exposed to the hazardous energy source/machine, the authorized employee will verify that the equipment is isolated and residual or stored energy is dissipated/restrained by activating the start button/switch or other operating control(s), or by testing the equipment with properly operating and/or calibrated equipment (i.e., voltmeter). Following testing/verification, the authorized employee will return the operating control(s) to the neutral ("off") position. Authorized employees must ensure the integrity of the lockout/tagout procedure following any extended absence.
- When the equipment is ready to be returned to service, the authorized employee should check the equipment and the immediate area to ensure that nonessential items have been removed, that all components are operationally intact, and that all guards or other protective features are restored.
- The authorized employee will check the work area to ensure that all personnel are safely positioned away from the equipment, and verify that the controls are in the neutral, off, or safe position.
- The authorized employee will remove the lockout device and tag, plug in the equipment, re-energize the equipment, and notify affected employees that work is complete and the equipment is ready to return to service.
- If the lockout device or tag must be temporarily removed from the energy-isolating device, the authorized employee must follow the sequence of actions below:
 - i. Clear the equipment of tools and materials and have all non-authorized employees leave the equipment area;
 - ii. Remove the lockout from the energy-isolating device;
 - iii. Energize the equipment and proceed with testing or positioning;
 - iv. De-energize all systems and reapply the energy control measures. Continue service and/or maintenance activities.

Appendix D

Lockout / Tagout for Motor Vehicles and Powered Industrial Equipment (Example)

Machine or Equipment Type: All Fleet Dump Body Trucks

Location: Public Works Garage , Main St. Vehicle ID # 0085

Date Procedure Created: 12/05/08 Verified By: Guy Foreman Date: 12/09/08

1. Notify all affected employees in the area.
2. Hang "Out of Service" Tag on the driver's side door or on the steering wheel.
3. Put your name, date, time and reason for lockout on the tag.
4. Place dump in position needed for repair if need.
5. Shutdown Procedure:
 - a. Put in "Park Gear" for automatic or "in gear" for Standard transmissions.
 - b. Set "Park Brake"
 - c. Turn engine "Off" remove ignition key.
 - d. Release air pressure if equipped.
 - e. See owner's manual for special shutdown procedures for performing various tasks.

6. Isolation of Power Sources:

Energy Type	Isolating Device	Location	Procedure
Mechanical Start up	Ignition Key	Inside Vehicle Cab	Turn key to "Off" position.
Electrical	"Red" Battery Cable	Battery Compartment	Remove from battery terminal(s) and secure from accidental contact with battery.

7. Blocking of Potential Mechanical Energy

Hazard	Equipment Needed	Placement Safety Devices
Falling Body or Dump	Properly rated jacks, jack Stands, blocking and dump Body pins.	For raising body use jacks and back up blocking. For dump body use 2 properly rated jack stands and dump body pins. Check owner's manual for recommended jack ratings.
Roll Away	Wheel Chocks	Set emergency brake and place chocks behind and in front of both left and right wheels.

8. Bleeding of Potential Energy

Energy	Bleed Down Points	Procedure
Hydraulics	Bleed Valves	Wait until oil cools then bleed off line. Place oil in container and dispose of properly.
Pneumatics	Bleed Valves	Open valve until pressure is relieved.

9. Verification Test

Lockout to Verify	Controls to try:	Process to verify Lockout
Mechanical Start up	Ignition Key	Turn ignition key to the "Off" position remove from Ignition and place inside lockbox and each employee involved in the vehicle maintenance must put a personal lock on the lockout box.
Electrical	Lights/Elect powered equipment	Check to see if the lights come on when switch is turned to the "On" position, the lights should not come on.
Falling Body or Dump	None	Check back up blocking for stress. If none, Primary jacks or pins are working to hold body in place.
Roll Away	None	Try to push vehicle, it should not move.
Hydraulics	Any hydraulic controls	Controls that were activated, the parts should not activate.
Pneumatics	Any pneumatics controls	Controls that were activated, the parts should not activate.

Appendix E Annual Lock-Out Tag-Out Self-Audit Form

Department:
Location:
Equipment/System:

Inspection Topics	Yes	No
1 A) Has there been a change in job assignments, machines, equipment or processes?		
B) If so, have employees been re-trained when job assignments, machines, equipment or processes have changed?		
2) Are the locks uniquely identified, uniquely keyed, and only used for the purpose of LOTO?		
3) Does the tag used with the lock identify the worker servicing the machine or equipment?		
4) Has equipment and machine-specific LOTO procedures been documented in writing?		
5) Does the employee know where the written LOTO procedures are located?		
6) Does the employee notify affected employees and all other employees in the area before starting the LOTO procedure?		
7) Can the employee identify all hazardous energy sources and associated hazards for the equipment or machine to be locked out?		
8) Does the employee follow the proper LOTO procedures for de-energizing the equipment or machine?		
9) Does the employee demonstrate the proper steps for the placement, removal and transfer of LOTO devices?		
10) Does the employee use the proper methods to verify the equipment or machine was de-energized?		
11) Before releasing the machine or equipment from LOTO, does the employee do the following:		
A) Inspect the machine or equipment to ensure it is operationally intact?		
B) Ensure that all employees are safely positioned?		
C) Notify affected employees and all other employees in the area that the LOTO devices have been removed?		
12) If you answered "No" to questions 2-11, has the employee been re-trained?		

Deficiencies Observed & Corrective Actions:

Inspected By_____ **Employee ID**_____ **Date**_____

* This Self-audit record must be maintained by the Department for minimum of two years.

APPENDIX F

OFFICE RECORDING _____

SCHOOL YEAR _____

NOTIFICATION TO POLICE & SAFETY OF EXTENDED SHIFT

[illegible]

SCHOOL YEAR _____

[illegible]