Safety & Risk Management Policies and Procedures

Title: Control of Hazardous Energy Policy (LockOut TagOut)
Date: July 2014

Rationale: Southwestern University is committed to providing a safe and healthful work environment. OSHA's Control of Hazardous Energy Standard (LOTO) standard (29 CFR 1910.147) requires Southwestern University to have a written Energy Control Plan. For work on electrical equipment which falls under Subpart S – Electrical - CFR29 1910.333, the lockout procedures for this policy may be used. Refer to 1910.333 for specific differences and applications. We have employees who may have the potential to be at risk of injury during the service or maintenance of equipment. This policy provides energy control procedures to establish and maintain safe working conditions during set-up, servicing and maintenance of machines, processes, and systems where the unexpected start-up or release of stored energy of machines could cause injury to our employees and/or contractor employees.

Goals: The purpose of this policy is to protect employees from the risk of unexpected startup or release of stored energy from equipment that could cause harm/injury during service or maintenance operations.

Policy: Energy control is required during the servicing and/or maintenance of machines and equipment. An energy control is required any time an employee or contractor must remove or bypass a guard or other safety device. It is also required when he/she must place any part of their body into an area on a machine or piece of equipment where work is actually performed (the point of operation), or where an associated danger zone exists during a machine operating cycle. All electrically energized equipment shall be verified as zero energy state by use of testing equipment by a qualified person.

Roles / Responsibilities:

"Authorized" Employees are responsible for following all equipment specific lockout/tagout procedures during the servicing, set-up, maintenance and repair of equipment.

"Affected" and "Other" Employees are responsible for not removing or defeating lockout/tagout devices when equipment is in a lockout/tagout state.

Definitions:

Affected Employee: An employee whose job requires him/her to operate or use a machine or equipment on which servicing or maintenance is being performed under lockout or tagout, or whose job requires him/her to work in an area in which such servicing or maintenance is being performed.

Authorized Employee: An employee whose job requires him/her to lock out or tag out machines or equipment in order to perform servicing or maintenance on that machine or equipment. An affected employee becomes an authorized employee when that employee's duties include performing servicing or maintenance covered under 1910.147.

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

Energized: Connected to an energy source or containing residual or stored energy.

Energy Isolating Device: A mechanical device that physically prevents the transmission or release of energy, including but not limited to the following: a manually operated electrical circuit breaker, a disconnect switch, a manually operated switch by which the conductors of a circuit can be disconnected from all ungrounded supply conductors and, in addition, no pole can be operated independently; a line valve; a block; and any similar device used to block or isolate energy. Push buttons, selector switches, and other control circuit type devices are not energy isolating devices.

Energy source: Any source of electrical, mechanical, hydraulic, pneumatic, chemical, thermal or other energy.

Hot tap: A procedure used in the repair, maintenance and service activities which involves welding on a piece of equipment (pipelines, vessels, or tanks) under pressure, in order to install connections or appurtenances. It is commonly used to replace or add sections of pipeline without the interruption of service for air, gas, water, steam, and petrochemical distribution systems.

Lockout: The placement of a lockout device on an energy isolating device, in accordance with an established procedure, ensuring that the energy isolating device and the equipment being controlled cannot be operated until the lockout device is removed.

Lockout device: A device that utilizes a positive means such as a lock, either key or combination type, to hold an energy isolating device in the safe position and prevent the energizing of a machine or equipment. This includes blank flanges and bolted slip blinds.

Normal production operations: The utilization of a machine or equipment to perform its intended production function.

Servicing and/or maintenance: Workplace activities such as constructing, installing, setting up, adjusting, inspecting, modifying, and maintaining and/or servicing machines or equipment. These activities include lubrication, cleaning or unjamming of machines or equipment and making adjustments or tool changes, where the employee exposed to the unexpected energization or startup of the equipment or release of hazardous energy.

Setting up: Any work performed to prepare a machine or equipment to perform its normal production operation.

Tagout: The placement of a tagout device on an energy isolating device in accordance with established procedure, to indicate that the energy isolating device and the equipment being controlled may not be operated until the tagout device is removed.

Tagout device: A prominent warning device, such as a tag and a means of attachment, which can be securely fastened to an energy isolating device in accordance with an established procedure, to indicate that the energy isolating device and the equipment being controlled may not be operated until the tagout device is removed.

Lockout Procedures:

Lockout is the preferred method of isolating equipment or machines from energy sources.

Tagout alone will only be used when it can be proven that the tagout procedures offer an equivalent level of protection as would be afforded by the use of a lockout device.

Equipment Specific Procedures: (**Appendix B**) - Equipment specific written procedures only need to be developed when the following elements DO NOT EXIST:

1. The machine or equipment has a single energy source.
2. The isolation of that energy source will completely de-energize and deactivate the machine.
3. The machine or equipment is isolated from that energy source and locked out during maintenance.
4. A single lockout device will achieve a locked out condition.
5. The lockout device is under the exclusive control of the authorized employee performing maintenance.

Equipment specific procedure sheets will be kept in the Manager of Physical Plant and/or Supervisor's offices.

NOTE: general lockout steps must still be conducted for equipment that does not require a "written procedure".

LOTO: General Lockout Steps: 6 STEPS

1. The supervisor will designate an “authorized” employee who will be responsible for notifying all “affected” employees that the machine will be locked out.
2. If the machine/equipment is operating, the “authorized” employee will shut it down by the normal stopping procedure. The “authorized” employee will turn off energy control(s) on the equipment, then turn off and lockout all energy sources.
3. The “authorized” employee(s) will then lockout and/or tagout the energy isolating devices with their assigned individual lock(s) and/or tag(s).
4. After ensuring no personnel are exposed, the “authorized” employee will test the lockout by trying to operate the equipment. Stored energy such as springs, elevated machine members, rotating flywheels, hydraulic systems, and air, gas, steam, or water pressure must be dissipated or restrained.
5. The “authorized” employee will then return the operating controls to the "neutral" or "off" position. For electrically energized equipment, a qualified person must use electrical testing equipment on the load side of the equipment being locked out to verify there is no electrical energy present.
6. The equipment is now locked or tagged out.

Release from Lockout/Tagout – 3 STEPS

7. After the servicing/maintenance is complete but before lockout and/or tagout devices are removed, the “authorized” employee will:
   - Inspect the work area to ensure that tools/items have been removed and that other components of the machine are operationally intact.
   - Replace any guards that may have been removed.
   - Make sure that all personnel are safely positioned.
   - Verify controls are in neutral or off position.
   - Remove lockout devices and reenergize equipment.
8. Notify affected employees service is complete.
9. The “authorized” employee can then start the machine/equipment according to the procedures.

LOTO for Plug Connected Equipment: Plug-in cord equipment operated by a single electrical source of 110 volt power will be unplugged and a Tag-out sign attached to the plug, **unless** the plug is under the exclusive control of the employee or constant sight of the employee. If plug-in cord equipment has multiple energy sources or an electrical power source of more than 110 volts, the “authorized” employee will use a plug lockout device secured by their personal lock.

Lockout/Tagout Procedures Involving More Than One Person:

1. If more than one individual is required to lockout or tagout equipment, one employee will be designated by the Supervisor as the “lead authorized” employee who has responsibility for controlling the group lockout.
2. Each authorized person will place his/her own assigned lockout and/or tagout device on the energy isolating device(s).

3. When an energy isolating device cannot accept multiple locks or tags, a multiple lockout or tagout device (hasp/spider) will be used. If lockout is used, a single lock may be used to lockout the machine or equipment with the key being placed in a lockout box which allows the use of multiple locks to secure it. The "lead authorized" employee will place his/her lock on the lock box.
4. Each employee will then use his/her own assigned lock to secure the box. As each person no longer needs to maintain his/her lockout protection, that person will remove his/her lock from the box. The " lead authorized" employee will not remove his/her lock from the lock box until he/she has been assured that all work is completed, all start up procedures have been followed, all unnecessary equipment removed, and all employees and contractor personnel accounted for.

Shift or Personnel Changes:

If an authorized employee involved with group lockout must leave the job before completion, because of job reassignment or shift change, the following steps must be taken.

1. The employee should remove his/her personal lock and replace it with a department lock.
2. If the employee who is leaving will be replaced by another employee, the replacement employee will place his/her lock in the opening on the group lockout device created by the departing employee.

Removing Lockout / Tagout Devices By Other Than the Employee Who Applied the Device:

If the employee who applied the lock is not available to remove it, the following steps will be taken:

1. The "lead authorized" employee will verify that the authorized employee who applied the lock is not on the property.
2. The "lead authorized" employee will make reasonable efforts to contact the employee to inform him/her that their lock or lockout device is to be removed.
3. The employee will be informed that his/her lock has been removed before the employee resumes work at the facility.
4. The "lead authorized" employee will complete a lockout removal record sheet as shown in Appendix D.

Notification to Outside Contractors:

1. Manager of Physical Plant (or designated Supervisor) will notify outside contractors who have employees engaged in activities that require lockout of Southwestern's lockout policy and procedures used within this facility. All contractors must abide by Southwestern University (OSHA 1910.147) lockout procedures to ensure the safety of the contractor's personnel and our employees who may be in the area/facility.

Training:

1. All personnel who conduct servicing/maintenance on equipment/machines will be trained on this policy and LOTO procedure(s). The Manager of Physical Plant/Supervisors will notify the Campus Safety & Risk Management Office to coordinate initial classroom employee training (video) for all authorized/affected personnel.

   Supervisors will be responsible to review this policy and procedures with all authorized/affected personnel on an annual basis. Training/briefing logs must be recorded by Supervisors (**APPENDIX F**).
   Scan and file Appendix F in Google Drive folder – LOTO.

2. Retraining of personnel will be conducted whenever one or more of the following conditions exist:
   - There is a job reassignment to a job which has a written lockout/tagout procedure.
   - There is a change in equipment or machinery which introduces a new source of hazardous energy or which modifies the existing lockout procedure for that unique piece of equipment.
   - There is a change in the lockout policy or program that impacts all authorized, affected and other employees.
   - A periodic inspection/audit reveals that an existing lockout procedure is inadequate or that employees have inadequate knowledge and skills in the equipment specific or general policy and procedure(s).
3. An outline of the key points covered in the training is shown in **Appendix G**.
4. Test/quiz may be given at the beginning or end of some training sessions to measure the level of understanding of the employee as well as to evaluate the effectiveness of the instruction materials.

Periodic LOTO Inspections and Program Audits:

1. At least **annually**, Supervisors will **conduct an in-the-field inspection** of the lockout/tagout procedures. The supervisor will review the "authorized" employees understanding of their responsibilities and the lockout/tagout program policy and procedures.
2. All **inspections will be documented** on the inspection form shown in (**Appendix H)**.
3. When inspections reveal deficiencies in the lockout/tagout program, the inspector will inform the Manager of Physical Plant and Director of Campus Safety & Risk Management in writing. The Manager of Physical Plant will be responsible for coordinating with the Supervisor and personnel to ensure that inspection deficiencies are promptly corrected. Correction steps will be documented and maintained on file, attached to each inspection report, for future review by authorized inspection agencies.
4. Supervisor will **scan/file LOTO inspection records in Google Drive – LOTO file** (App. H.).

5. **Annually** the entire *Hazardous Energy Control Program* will be **audited** by the Director of Campus Safety & Risk Management with input by Senior Manager of Facilities Management Operations and authorized Supervisors. The audit will be documented using Southwestern's **Safety-Reports.com audit software**. Copies of the audit report will be distributed to the AVP for Facilities, Manager of Physical Plant, VP Finance and Administration. Deficiencies noted should be corrected within five (5) business days upon receipt. Manager/supervisor should document corrective action in the Safety-Reports.com CAT link.

Appendix A

Lockout/Tagout Procedure Checklist - Energy Source Determination

Date:_____ **Conducted By:**_____

Location:_____ **Building:** _____

Line/Process:_____ **Equipment No.** _____

Equipment Name/Description:_____

Does this equipment have:

1. **Electric power** (including battery)? YES/NO
2. **Mechanical power**? YES/NO
   Mark each type of energy source that applies:
   a. **Engine driven**? YES/NO
   b. **Spring loaded**? YES/NO
   c. **Counter weight(s)**? YES/NO
   d. **Flywheel**? YES/NO
3. **Hydraulic power**? YES/NO
4. **Pneumatic energy**? YES/NO
5. **Chemical system**? YES/NO
6. **Thermal energy**? YES/NO

Equipment Specific Procedures: Equipment specific "written procedures" will be developed for all affected equipment that does not meet the following elements. A documented written procedure is **not required** when all of the following elements exist:

1 The machine or equipment has no potential for stored or residual energy or re-accumulation of stored energy after shut down which could endanger employees.
2 The machine or equipment has a single energy source which can be readily 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 the servicing and 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.
7 The servicing or maintenance does not create hazards for other employees.
8 Southwestern University has had no accidents involving the unexpected activation or re-energization of the machine or equipment during any servicing or maintenance operations in the past.

Appendix B

Equipment Specific - Lockout/Tagout Procedure

Equipment, Machinery, or Process: _____

Lockout Procedure No.: L/O -_____-_____

Date Approved/Implemented: _____

Note: Only required for all equipment, machinery, and/or processes that **fail to meet the exceptions** noted in 29 CFR1910.147 (c)(4)(i). **See LockOut Procedures section page 3**. The purpose of this procedure is to protect employees from injury during the maintenance, set-up, and servicing of equipment.

1. Type(s) and magnitude(s) of energy sources presented and the hazards presented by them:

Electrical:	_____	Voltage:	_____
Hydraulic:	_____	Pressure:	_____
Pneumatic:	_____	Pressure:	_____
Thermal:	_____	Temperature:	_____
Steam:	_____	Pressure:	_____
Chemical:	_____	Type:	_____
Mechanical:	_____	Type:	_____

2. Names/job titles of Authorized employees who can perform lockout/tagout on this piece of equipment.

Name	Job Title

3. Names/job titles of Affected employees and how they will be notified of lockout/tagout operations to be initiated/completed.

Name	Job Title

4. Type(s) and location(s) of energy isolating means:

Identify Energy Source and location	Lockable? (Y/N)	Type of LOTO Device Needed

5. Type(s) of stored energy and methods to dissipate/restrain:
   Battery:
   Capacitor:
   Gravitational:
   Flywheel:
   Spring-loaded:
   Counter weights:
   Pressure:
   Thermal:

6. Shutdown procedure to be followed to lock and tag equipment (i.e. types of locks, tags, additional safety measures, etc.) Include preparation for shutdown, shutdown of equipment, isolation and lockout procedure:

7. Procedure, type(s) of equipment and method used to verify zero energy state before proceeding with maintenance or repairs:

8. Start up procedure (include inspection of work area, checking to verify safe positioning of employees, preparation for removal of LOTO devices, and reenergization of equipment).

9. Name(s)/job title(s) of employees authorized for group lockout/tagout:

Name	Job Title

10. Special precautions not noted above (i.e. fire hazards, chemical reactions, required cool down periods, etc.)

Appendix C

List of Authorized Lockout/Tagout Employees

Employee Name	Lock #/Color	Mechanical Yes/No	Electrical Yes/No*

Department: _____ Group: _____

Date: _____ Supervisor: _____

Scan/file in Google Drive – LOTO (App. C)

Appendix D

Lock Out Removal Record

Date:_____Time:_____Equipment: _____

Name of Lock Owner: _____

Has Lock Owner Been Located? YES/NO

What were the results of your attempt to locate the lock owner?

_____

_____

_____

Name of person cutting or removing lock/tag/lockout device: _____

I certify that equipment/process and personnel safety have been assured and that the above lock/tag/lockout device may be safely removed.

Signature:_____Job Title: _____

The above listed lock owner was informed that his/her lock had been removed on (date) _____
by (name/job title) _____

cc: Manager of Physical Plant _____

Lock Owner _____

Appendix E

Contractor Notification of Lockout / Tagout Policy and Procedures

Southwestern University has developed a Hazardous Energy Control (Lockout/Tagout) program to protect its employees during maintenance and servicing of equipment and machines. This policy/procedure is designed to be equivalent to the OSHA Control of Hazardous Energy (LOTO) standard 29CFR 1910.147. My company and my individual employees have responsibility to follow safe work procedures in accordance with this standard.

Contractor Company Name: _____

Contractor Representative: _____

Date Notified: _____ By (Southwestern representative): _____

Appendix F

Department_____ Group: _____

Supervisor Training Record for Lockout/Tagout Policy & Procedure

(Print) Employee Name	Signature

Print Supervisor's Name:_____

Supervisor's Signature:_____ **Date of Training**: _____

Scan/file in google drive – LOTO (App. F)

Appendix G

Key Points Covered in Lockout/Tagout Training Program

1. OSHA standard 29 CFR 1910.147
2. Procedures to be followed for control of potentially hazardous energy.
3. Southwestern University (Physical Plant) will provide locks, tags, chains, wedges, key blocks, adapter pins, self locking fasteners, or other hardware for isolating, securing, or blocking machines or equipment during set up, servicing, maintenance and repair operations.
4. Lockout/tagout devices key concept.
5. Lockout/tagout devices are to be used only for controlling hazardous energy and no other purposes.
6. Durable lockout/tagout devices must be capable of withstanding the environment to which they are exposed for the maximum period of time that exposure is expected.
7. Standardized lockout/tagout devices must be provided in at least color, shape or size. For tagout devices must have standardized printing and layout format. Must be legible and understandable.
8. Identifiable lockout/tagout devices must indicate the identity of the employee who applied the device.
9. When major modifications are made to machinery, electrical systems or when new machinery is installed, the energy source must be designed to accept a lockout device.
10. LOTO operation being inspected/audited. The inspection is designed to identify and correct any deficiencies in written procedures, application of procedures or the training program. The inspection will include a review of each authorized employee's responsibilities under the procedure(s). If tagout is being used then the inspection will include a review of the limitations of tags.
11. Tagout devices must be "substantial" and attached in a means that is sufficient to prevent inadvertent or accidental removal. Attachment means must be of a non-reusable type; attached by hand; self-locking; non-releasable with minimum unlocking strength of not less than 50 pounds; at least equivalent in design and characteristics to one-piece, all environment tolerant nylon cable tie; and if used with electrical must be non-conductive.
12. Warnings will warn against hazardous conditions if the machine or equipment will be or is energized. Legend such as "Do Not Start", "Do Not Close", Do Not Energize", Do Not Operate" will be used.
13. Training on the limitations of tags will stress that tags are: warning devices, not physical restraint; do not remove them without authorization; never bypass, ignore or otherwise defeat a tagout device; they must be legible and understandable; tags must substantially and securely attached to the energy isolating device and capable of withstanding the environment to which they are exposed; they may evoke a false sense of security.
14. Application of lockout/tagout devices should clearly indicate that the operation or movement of energy isolating devices from "safe" or "off" position is prohibited. Attach Tag at the same point that a lock would have been attached if lockout capability exists. If cannot affix Tag to the energy isolating device then affix as close as safely possible and in an obvious position.
15. Contractor control procedures including notification of (company name) procedures and verification of training/certification of contractor employees.
16. Written and/or oral test given to determine level of understanding.

Appendix H

Annual - Periodic LOTO Supervisor Inspection Report

Department/Group:_____/ _____

Machine/Equipment:_____

Building/Location: _____

Authorized Employee(s) Observed (list names):

_____

Task being completed under lockout/tagout:

_____

_____

Are employee(s) following their responsibilities under our LOTO program? ☐ YES ☐ NO

Program/procedure deficiencies identified: ☐ YES ☐ NO
If Yes (describe):

_____

Recommended corrective action needed: ☐ YES ☐ NA
If Yes (describe):

_____

Corrective action taken: ☐ YES ☐ NO Date: _____

Supervisor Printed Name:_____

Inspection completed by (Signature):_____Date:_____

Scan/file in Google drive – LOTO (App. H)