

8. Appendices

8.1 Definitions

a. Affected Employee:

Any person (faculty, staff, employee, or student) who operates or maintains equipment that may be locked/tagged out. Also, any person who works in an area where equipment is being serviced.

b. Alternative Method:

An exception when LOTO is not required or is impracticable on a machine or piece of equipment DURING MAINTENANCE ACTIVITIES. This deviation from LOTO procedures must be reviewed and approved. As an example, LOTO may not be required in the instance if it can be demonstrated that alternative means enable employees to service the machine without being exposed to an unexpected activation of the equipment or release of stored energy. The alternative method must be approved by the supervisor.

c. Authorized Employee:

Any person (faculty, staff, employee, or student) who locks/tags out machines or equipment in order to perform servicing or maintenance. Authorized Persons must initially attend and complete VWCC Control of Hazardous Energies training course and will receive equipment-specific training.

d. Authorized Inspector:

An authorized employee who has been trained and has demonstrated proficiency to perform servicing and maintenance on the machine or equipment to be inspected.

e. 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.

f. Tagout

The placement of a warning/identification tag on an energy-isolating device to indicate that the equipment must not be operated. Identifies the person who applied the lock/tag.

g. Tagout Device:

Must include Employee's Name, warning against hazardous condition if the machine or equipment is energized and a legend such as the following: "Do Not Start, Do Not Open, Do Not Close, Do Not Energize, Do Not Operate Wires, tie wraps, or cords shall be used

for securing the tags to the energy control point and must be able to withstand 50 lbs. of force."

h. Danger Zone:

The area or workspace where, if the hazardous energy was inadvertently released, the energy could potentially cause injury.

Examples of danger zones include:

- *Electrical work*-- areas where a person could receive an electric shock if the electrical energy inadvertently became re-energized.
- *Hazardous chemical line of work* -- areas where a person could be exposed to the hazardous liquids, vapors, gases, or mists if the line is inadvertently opened and chemical leaks out. *Mechanical work areas with the potential for crushing, pinching, cutting, snagging, or puncturing.*

i. De-Energization:

Parts are de-energized when the working potential is completely depleted, discharged, or has returned to a non-hazardous state.

1. Energy: (Includes, but is not limited to)

- a. Mechanical motion -- moving links, bars, chains, belts, sliders, wheels, shafts, gates, rams, blades, pistons, etc.
- b. Potential or stored energy-- pressure (above ambient pressure) vacuum (below ambient pressure), gravity, springs, batteries, or capacitors.
- c. Electrical energy-- potentially hazardous voltage (>50 volts), hazardous static electrical potentials, or may be stored in a capacitor.
- d. Ultraviolet light sources x-ray sources or high-level magnetic fields.
 1. Thermal energy - very hot or very cold temperatures (e.g., <32F/0 C or> 140F/60C)
 2. Chemical energy -- reactive, corrosive, flammable, poisons, oxidizer materials, or other Hazardous Production Materials.

j. Energy Control Point:

The single point at which hazardous energy flow can be effectively and positively blocked so that it can no longer cause injury or loss of resources. There may be more than one Energy Control Point on a tool.

1. Energy Control Procedure:

- a. *Specific* Steps for shutting down and isolating hazardous energies.
- b. Procedures for applying, removing, and transferring lockout/ tagout devices.
- c. Requirement for testing a machine/piece of equipment to determine and verify the effectiveness of lockout/ tagout procedures.

k. Energy-Isolating Device:

A mechanical device that physically prevents the transmission or release of energy. Examples of energy-isolating devices are a manually operated circuit breaker, a disconnect switch, a valve, a mechanical blocking device, or any similar device used to block or isolate hazardous energy.

1. Energized:

- a. Connected to an energy source or containing residual or stored energy.
Hazardous Pressures
- b. ~5 psi (HPMS)
- c. ~psi other liquids/gases

l. Impracticable:

A LOTO that cannot be performed due to equipment, engineering or work environment difficulties that would increase the potential hazard to employees who perform the LOTO or equipment or process design that does not allow for isolation of hazardous energy. This does not include convenience for the staff.

m. Lockout:

The placement of a physical restraint, energy-isolating device, which ensures that the equipment cannot be operated or release a hazardous energy.

n. Lockout Device:

A device that utilizes a positive means such as a lock to hold the energy-isolating device in the safe position and prevent the energization of a machine or equipment. Included are blank flanges and bolt slip blinds. The Federal OSHA regulation specifies that the lockout device must be substantial so that it cannot be easily removed or defeated without excessive force or unusual techniques. (e.g. bolt cutters, hacksaw).

o. Lockout:

A device that attaches to a hazardous energy control point that provides the lockout function of an actual locking device, yet enables multiple users to attach their individual locks. Typical devices have the capability to attach 6 or more additional locks.

p. Lock Box:

An approved box or container into which a key or set of keys could be placed. Lock boxes shall be substantial enough to prevent entry without the use of excessive force or unusual techniques; such as with the use of bolt cutter or other metal cutting tools. Lock boxes must be capable of being locked out with a hasp or other means of attachment to which, or through which, a lock and/or lockout scissors can be affixed.

q. Servicing and Maintenance:

Any scheduled or unscheduled activity that, when complete, will enable the machine to perform its intended function; such as constructing, installing, setting up, adjusting, inspecting, demobilizing, modifying, and maintaining and/or servicing machines or equipment.

The following appendices contain forms that must be used by college employees to document adherence with LOTO procedures as outlined in this policy:

Appendix 8.2 VWCC Energy Control Procedure

Appendix 8.3 Control of Hazardous Energies Abandoned Lock Removal Form

Appendix 8.4 Periodic Inspection Checklist for Control of Hazardous Energies

APPENDIX 8.2

VWCC ENERGY CONTROL PROCEDURE CHECKLIST

Equipment ID:	Mfrg:		Model No:		ID No:	
Equipment Location(s):			Date Performed:			
Task(s) to be Performed:						
Name of Person Performing Assessment:						

A. ENERGY FORM(S): (Check all that apply)

<input type="checkbox"/> 1. <u>Electrical</u> a. Low Voltage (50-600V) b. High Voltage (>600V) <input type="checkbox"/> 2. <u>Chemical/Explosion</u> , pressure, extreme heat, fire, corrosive, reactive, oxidizer, toxic <input type="checkbox"/> 3. <u>Pressure</u> a. Pneumatic b. Hydraulic <input type="checkbox"/> 4. <u>Vacuum</u>	<input type="checkbox"/> 5. <u>Mechanical</u> – capable of crushing, pinching, cutting, snagging, striking. <input type="checkbox"/> 6. <u>Thermal</u> – High Temperature, Surface temperature, Hot Liquids, steam <input type="checkbox"/> 7. <u>Thermal</u> – Cryogenic – contact with super cold surface or with cryogenic liquid. <input type="checkbox"/> 8. <u>Ionizing Radiation</u>	<input type="checkbox"/> 9. <u>Non-Ionizing Radiation</u> a. Ultraviolet b. Infrared c. Rf/Microwave d. Laser e. Magnetic Fields <input type="checkbox"/> 10. <u>Stored</u> – Flywheels, springs, differences in elevation, elevated parts that could drop, capacitors, batteries.
--	--	--

B. BASIC PROCEDURES

<u>Lockout Procedure:</u> <input type="checkbox"/> 1. Notify all affected personnel of LOTO. <input type="checkbox"/> 2. Turn off power at disconnect points listed in Column C.1. <input type="checkbox"/> 3. LOTO each energy control point listed in Column C.1. <input type="checkbox"/> 4. Dissipate/disconnect any stored energy. See Column C.2. {N/A} <input type="checkbox"/> 5. Block any mechanical parts, remove any mechanical links. Lock blocking in place. {N/A} (NOTE: Two physical blocks required to secure any gas/liquid line) <input type="checkbox"/> 6. Verify personnel are clear of hazards. <input type="checkbox"/> 7. Verify no hazardous energy remains. Use circuit tester/meter if electrical energy is involved. See Column C.4. <input type="checkbox"/> 8. Attempt to re-start machinery or re-energize	<u>Procedure to Return Device to Operation:</u> <input type="checkbox"/> 10. Verify Danger Zone is clear of equipment, workers, tools, and test equipment. <input type="checkbox"/> 11. Unlock and remove any blocking devices; remove linkages. <input type="checkbox"/> 12. Reposition any safety devices. <input type="checkbox"/> 13. Warn workers to stay clear of area. <input type="checkbox"/> 14. Remove all locks and tags from energy control points. <input type="checkbox"/> 15. Verify area is clear of personnel. <input type="checkbox"/> 16. Re-start/re-energize the equipment. <input type="checkbox"/> 17. Notify all affected personnel and other persons that the lockout has been cleared.
---	--

C. SPECIFIC PROCEDURES

Hazardous Energy (Specify form & Values, including names of chemicals)	C.1 Specific Lockout Locations	C.2 Dissipate Stored Energy At These Points	C.3 Block These Parts/Remove Linkages	C.4 Verify Residual Energy By These Methods

SHIFT CHANGES: If this procedure lasts beyond one work shift, the relief crew will apply their locks and tags before the departing shift removes their locks and tags. **If this does not happen, the new crew must start with a new ECP.**

APPENDIX 8.3

CONTROL OF HAZARDOUS ENERGIES ABANDONED LOCK REMOVAL FORM

This form is to be used any time a Lockout/Tagout (LOTO) device is to be removed by someone other than the person who placed the LOTO device. The person removing the LOTO device must be directed to do so by the Trades Manager.

DATE:		Time:	
1.	Name of LOTO device owner whose lock/tag is to be removed:		
2.	LOTO device owner's extension/pager		
3.	LOTO device owner's Manger		
4.	Document attempt to contact LOTO device owner.		
	Date/Time	Method of attempted contact	Result
	1.		
	2.		
5.	Reason for removing lock (e.g. LOTO owner called in sick, LOTO device owner forgot to remove lock before leaving site, etc.)		
6.	Evaluate the entire affected system to ensure employee's safety before LOTO device is removed. LOTO device(s) removed by:		
	Removed by (Print)	Observed by (Print)	
	Trades Manager Signature:	Authorized Employee's Signature:	
	Date/Time:	Date/Time:	
7.	FMS management notify (i.e. email or phone call/message) that a LOTO device has been removed within 24 hours of removal.		
	Other Info		
	Date:	Time:	

Signature of Authorized Employee Observed: _____

APPENDIX 8.4

VWCC PERIODIC INSPECTION CHECKLIST FOR CONTROL OF HAZARDOUS ENERGIES

Authorized Employee Observed:			
Equipment:		Date:	
Procedure:		Location:	
Periodic Inspector:			
<u>Hazardous Energies Involved:</u>			
a) Electrical: Voltage: _____		f) Ionizing Radiation	
b) Chemical		g) Non-Ionizing Radiation	
c) Pressure (pneumatic/hydraulic)		Ultraviolet _____ Infrared _____	
d) Vacuum		RF/Microwave _____ Laser _____	
e) Thermal: High Temp: _____ Cryogenics: _____		Magnetic Fields _____	
		h) Stored	

Procedural Steps	YES	NO	Comments
<i>TO LOCK OUT THE EQUIPMENT</i>			
1. Notified Affected Employees of LOTO			
2. Identified all power disconnect points. Specific Points: _____			
3. Stopped or powered down equipment			
4. Isolated equipment from all hazardous energies sources. Number of isolation Points: _____			
5. Applied LOTO device(s) energy isolating device locked in OFF position.			
6. Attached LOTO Tag to Lock			
7. Dissipated, drained, or safely released stored or residual energy.			
8. Blocked mechanical parts or removed mechanical links			
9. Attempted to re-start machinery or re-energize equipment through normal means. Returned switch to OFF position.			
10. Verified no hazardous energies present or isolated. Identify test equipment/meters.			
<i>TO RE-ENERGIZE THE EQUIPMENT</i>			
1. Inspected work zone to ensure it is clear of equipment, workers, tools, and test equipment			
2. Unlocked and removed any blocking devices and replaced mechanical linkages.			
3. Repositioned safety valve(s) left open to prevent re-buildup of pressure			
4. Checked all guarding and safety controls properly replaced			
5. Warned workers to stay clear of area			
6. Removed all locks and tags from energy control points.			
7. Verified area clear of personnel			
8. Restarted/re-energized equipment			
9. Notified Affected Employees LOTO completed			

The results of this inspection were discussed between the Authorized Employee being Observed and the Inspector.

Signature Trades Manger Observed:	
--	--

Approved by

Robert H. Sandel, Ed.D.
President

Date