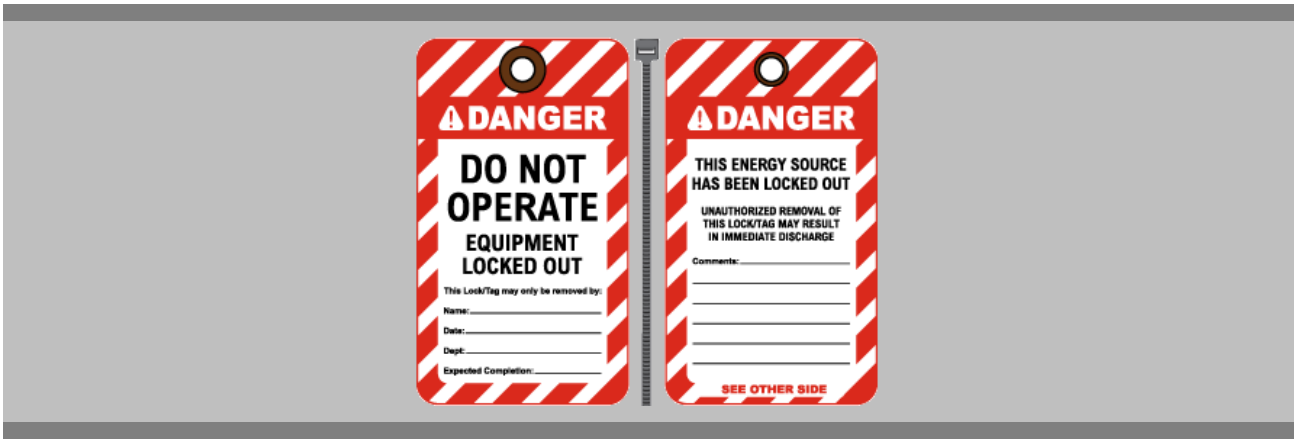
University of Portland

CONTROL OF HAZARDOUS ENERGY PROGRAM (LOCK-OUT/TAGOUT)



UNIVERSITY OF PORTLAND

PORTLAND, OREGON

SAFETY FIRST

APRIL 2023

University of Portland

CONTROL OF HAZARDOUS ENERGY PROGRAM (LOCK-OUT/TAGOUT)

T A B L E O F C O N T E N T S

1.0 INTRODUCTION 1

2.0 PURPOSE 1

3.0 RESPONSIBILITY 1

4.0 PREPARATION FOR LOCKOUT OR TAGOUT 2

5.0 DEFININTIONS OF LOCKOUT TAGOUT 2

6.0 WHEN TO LOCK OUT EQUIPMENT 3

7.O WHERE TO LOCK OUT EQUIPMENT 3

8.0 SEQUENCE OF LOCKOUT OR TAGOUT SYSTEM PROCEDURES 3

9.0 RESTORING MACHINES OR EQUIPMENT TO NORMAL PRODUCTION OPERATIONS 4

10.0 PROCEDURE INVOLVING MORE THAN ONE PERSON 4

11.0 SHIFT OF PERSONNEL CHANGES 4

12.0 LOCK REMOVAL WHEN AN EMPLOYEE IS NOT PRESENT 5

13.0 CONTRACTORS 6

14.0 PERIODIC INSPECTIONS 6

11.0 CONTRACTORS 6

12.0 LONG DURATION LOCKOUT/TAGOUT 6

APPENDIX A ENERGY SOURCES 7

APPENDIX B *AUTHORIZED EMPLOYEE*S LIST 7

APPENDIX C LIST OF EQUIPMENT, LOCATIONS AND ISOLATION SOURCES
LOCKOUT/TAGOUT PROCEDURES FORM
PROCEDURES FORM INSTRUCTIONS 8

APPENDIX D EMPLOYEES AUTHORIZED FOR GROUP LOCKOUT/TAGOUT 13

APPENDIX E INSPECTION FORM FOR SITE LOCKOUT/TAGOUT PROCEDURES 14

APPENDIX F EXTRA KEYS FOR SITE LOCKOUT 15

APPENDIX G EMPLOYEES AUTHORIZED TO INSTRUCT OTHER EMPLOYEES 15

APPENDIX H LOCKOUT/TAGOUT DECISION MATRIX 16

University of Portland

CONTROL OF HAZARDOUS ENERGY PROGRAM (LOCK-OUT/TAGOUT)

1.0 INTRODUCTION

This program is designed to protect employees of University or Portland when performing maintenance or servicing activities, and in the surrounding area, from the unexpected startup of equipment or the release of stored energy. It also is designed to protect University or Portland employees from the unexpected start-up of equipment during tool changes and adjustments.

2.0 PURPOSE

This program establishes the minimum requirements for the Lockout or Tagout of energy isolating devices to protect University or Portland employees. This program follows the OSHA standards for the control of hazardous energy, CFR 1910.147 The Oregon OSHA Lock-out/Tagout rules are referenced under OAR Cg, 435 Oregon Occupational and Safety and Health Code, Division 2, Subdivision 0, Machinery and Machine Guarding.

> "*Energy Isolating Devices* are defined as: 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 underground supply conductors and, in addition, no pole can be operated independently, a side gate, a slip blind, a line valve, a block, and any similar device used to block or isolate energy. The term does *not* include a push button, selector switch, and other control type device."

The types of energy sources being addressed in this program are:

✓ Electrical ✓ Pneumatic ✓ Hydraulic ✓ Mechanical

Before a lockout or tagout is considered, the type of energy, magnitude of the energy, and the potential hazards (See Appendix A) must be identified and addressed.

The purpose of this program is to prevent personal injury and property damage due to the accidental startup

3.0 RESPONSIBILITY

All employees of University or Portland are required to comply with the restrictions and limitations of this program. Only *Authorized Employees* are required to perform the lockout/tagout in strict accordance with this program. All Authorized Employees must be trained in the procedures of Lockout/Tagout by a designated trainer.

All University or Portland employees, upon observing a machine or piece of equipment that is locked out or tagged out to perform serving or maintenance, may NOT attempt to start, energize, or use that machine or equipment.

Authorized Employees are trained in the lockout procedures for each machine or piece of equipment that they are authorized to lock out or tag out. If an employee has not been trained on some machines or pieces of equipment, he/she may not lock out or tag out those machines or pieces of equipment.

Environmental Health and Safety (EHS) oversees the development and management of the written Lock-out/Tag-out Program and communicate it to anyone who participates in the Lock-out/Tag-out program. EHS

Ensures all participants are trained in the Lock-out/Tag-out Program, while Supervisors ensure that employees are trained in the specifics of the lock-out/tag-out systems they will utilize.

Departments are responsible for providing employees with personal locks and tags for their use in protecting themselves. Locks need to be identified with employee's identity (lock number, name, etc.).

Employees are responsible for understanding and following the established lock-out/tag-out safety rules and procedure. Each employee needs to ensure that fellow employees are not exposed to the dangers of moving machinery, equipment, or process systems. Employees should ask questions and refrain from performing work that requires lock-out/tag-out if they do have questions or concerns about the program or project scope.

4.0 PREPARATION FOR LOCKOUT OR TAGOUT

A survey of all equipment to locate and identify all isolating devices must be conducted by to be certain which switch(es), valve(s), or other energy source may be involved.

Details concerning the type(s) and location(s) of energy isolating means for specific equipment can be found by reviewing that equipment's individual Lockout/Tagout Procedure (See Appendix C).

5.0 DEFINITIONS OF LOCK OUT/TAG OUT

The term **lockout** means using a lock and a device that, when in use, makes it impossible to activate a switch, circuit breaker, etc. that would set a machine/process in motion endangering an employee working on the machine/process.

The term **tagout** means using a tag to warn against activation of a switch, circuit breaker, etc. that would set a machine/process in motion endangering an employee working on that machine/process. Tag-out is only utilized when a lock-out is not possible.

Locking out to a **Zero Energy State** is a planned approach for service and maintenance safety, which considers the total energy of a system, and which eliminated the possibility of sudden or unexpected release of that energy during such service or maintenance functions.

Authorized Employees are those employees who are authorized to implement Lockout/Tagout procedures, and have been trained in the Lockout/Tagout Program.

Affected Employees are those employees who operate or work in the area of the equipment from which power may be isolated, or who work in the area(s) where energy isolation is performed.

6.0 WHEN TO LOCK-OUT EQUIPMENT

Equipment/machinery will be locked out under any of the following conditions:

Whenever someone is going to work on a piece of machinery, whether energized or not, where that person might be caught, struck, pinned, thrown, or in some way hurt by the movement of the machine. A "Zero Energy State" needs to be attained to prevent a sudden movement or unexpected release of energy.

- Whenever there is a possibility of someone coming in contact with a live (i.e. energized) electrical part. This could occur when it is necessary to remove energy from a stored energy device such as a shear, flywheel, air pressure device, etc.
- During shut down to prevent accidental start-ups
- During the time when plug-ups, hang-ups, bottlenecks, etc. cause individuals to leave the control stations and actually come into contact with or work in the point of operation to eliminate the problem.

If there are questions about the safety of the machine, the responsible supervisor is required to decided if it should be locked out. If continued operation of the machine may cause serious damage, the responsible supervisor is required to decide if it should be locked out.

7.0 WHERE TO LOCK-OUT EQUIPMENT

Locks shall be placed, when possible, at the energy source:

- Motor disconnect
- Branch poser switch
- Branch power breaker
- Feed line
- Other sources of stored potential or kinetic energy

Circuit breaker panels as a whole are not acceptable lock-out points – in locking the entire panel, all of the other breakers will be locked out as well, preventing energy access.

The ON/OFF switch for the piece of equipment (whether on a pedestal, control, or physically attached to the machine) does not constitute a lock-out point. The power source must be the lock-out point.

8.0 SEQUENCE OF LOCKOUT OR TAGOUT PROCEDURES - (6 STEPS)

1. All affected University or Portland employees are **notified** in advance that a Lockout or Tagout system is utilized and the reason it is necessary. The *Authorized Employee* will review the type and magnitude of the energy of the specific machine or equipment and will understand the **potential hazards** prior to initiating procedures.

   Note: If at any point there is a question concerning the procedure, the University or Portland Authorized Employee is to stop, secure the area, and immediately contact his/her immediate supervisor.

2. If the machine or equipment is operating, the *Authorized Employee* will **shut it down** by the normal stopping procedure (depress stop button, open toggle switch, etc.).

3. In accordance with the specific machine(s) or equipment(s) Lockout/Tagout procedures, the *Authorized Employee* operates the switch, valve, or other energy isolating device(s) so that the **equipment is isolated** from its energy source(s). Stored energy (such as that in elevated machine members, hydraulic/pneumatic systems, steam, electrical capacitance) is dissipated or restrained by the following methods:

Type of Stored Energy	Methods to Dissipate or Restrain
Electrical	Shut off main disconnect, Bleed Electrical Capacitance
Pneumatic	Close valve(s), Bleed Air Pressure, Lower Machine Members
Hydraulic	Close valve(s), Bleed Fluid/Pressure, Blocking, Lower Machine Membe
Mechanical	Blocking, Lower Machine Members

4. In accordance with the specific machine's or equipment's Lockout/Tagout procedure, the *Authorized Employee* will **lockout and/or tagout** the energy isolating devices with assigned individual lock(s) and tag(s). Additional safety measures may be required on specific equipment.
5. After ensuring that no University or Portland employees are exposed, and conducting a **check** to ensure the disconnection of all designated energy sources, the *Authorized Employee* operates the push button or other normal operating controls to make certain the equipment will not operate.

Caution: Return operating control(s) to "Neutral" or "Off" position after Test.

6. **The equipment is now safely locked out or tagged out.**

CAUTION: Many machines stop slowly as rotating parts slow down. Wait until the entire machine is fully stopped and all air and hydraulic pressure is bled down to zero before working.

9.0 RESTORING MACHINES OR EQUIPMENT TO NORMAL PRODUCTION OPERATION - (6 STEPS)

When Anyone placing his/her lock and/or tag on a machine or equipment must realize the importance of promptly removing his/her lock and/or tag when the work is completed; otherwise, delay and confusion can result until such person can be located.

When the servicing or maintenance is completed, and the machine or equipment is ready to return to normal operating condition, the *Authorized Employee* takes the following steps:

1. **Check the machine or equipment** and the immediate area around the machine or equipment to ensure that nonessential items have been removed and that the machine or equipment components are operationally intact. In addition, any tools brought into the area to service the equipment have been removed.

2. **Check the work area** to ensure that all University or Portland employees have been safely positioned or removed from the area.
3. **Verify** that controls are in neutral.
4. After all the above steps have been completed and the guards have been reinstalled, **remove** all Lockout and/or Tagout devices in accordance with specific procedures.
5. **Notify** affected University or Portland employees that the servicing and/or maintenance is completed and the machine or equipment is ready for use.
6. **Operate** the energy isolating device(s) in accordance with normal start up procedure to restore energy to the machine(s) or equipment.

10.0 PROCEDURE INVOLVING MORE THAN ONE PERSON

If more than one individual is required to lockout or tagout equipment, each places his/her own personal lockout device or tagout device on the energy isolating device(s). When an energy-isolating device cannot accept multiple locks or tags, a multiple lockout or tagout device (hasp) may 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 or cabinet which allows the use of multiple locks to secure it. Each employee will then use his/her own lock to secure the box or cabinet. As each person no longer needs to maintain his/her lockout protection, that person will remove his/her own lock from the box or cabinet.

For a listing of University or Portland employees who are authorized for group Lockout/Tagout, see Appendix D. (*Note: single-lock group lockout is prohibited in all industries; all locks must be unique for each qualified individual. See OR-OSHA Admin. Order 2-1990, f. 1/19/90, ef. 3/1/90 and OR-OSHA Admin. Order 12-2001, f. 10/26/01, ef. 10/26/01)

11.0 SHIFT OF PERSONNEL CHANGES

If work has begun and carries over to the next shift, the oncoming crew attaches its own Locks and/or Tags before the outgoing crew removes theirs.

12.0 LOCK REMOVAL WHEN AN EMPLOYEE IS NOT PRESENT

A lock can be removed only after taking the following three steps to ascertain that the employee has indeed left the Site and that no one else is working on the machine or equipment:

a. Personally checking the machine(s) or equipment
b. Checking the individual's time card
c. Trying to telephone the worker involved

If an employee goes home and forgets to remove his/her lock and/or tag, the supervsior must be notified who will assess the work completed, locating all University or Portland employees working on the machine(s) or equipment.

In this situation, the employee's immediate supervisor or the department's Director/Assistant Director are authorized to remove the employee's lock or tag. This shall only be accomplished when the employee is unable to perform the lock or tag removal and the circumstances warrant removal action. The supervisor or Director/Assistant Director removing the lock or tag shall bear full responsibility for the removal action.

At that point, the extra key is retrieved from the office and the attached form, Extra Keys For Site Lockout (see Appendix F), is signed with date and time and reason for using the extra key.

After a complete inspection of the machine(s) and/or equipment and visually locating all University or Portland employees in the machine area, he/she may unlock the energy isolating device in accordance following the steps in section 6.0 Restoring Machines or Equipment to Normal Production Operations described above.

Upon return to the Site, the employee who forgot to unlock his/her lockout device and/or remove his/her tag will be need to discuss the oversight with their supervisor, and EHS and/or the Assistant Director

13.0 CONTRACTORS

Prior to work being performed, an *Authorized Employee* and the contractor inform each other of their respective lockout/tagout policy/procedures. If the contractor's lockout/tagout procedures are to be utilized, all affected University or Portland employees are instructed on the restrictions and prohibitions of the contractor's procedures.

14.0 PERIODIC INSPECTIONS

An *Authorized Employee*, other than the ones utilizing the Lockout/Tagout Procedures being inspected, makes periodic inspections. These inspections are documented on the Inspection Form for Site Lockout/Tagout Procedures (See Appendix E). This should be conducted at least annually to ensure the proper lockout/tagout procedures are being followed. The periodic inspection should be performed by a supervisor, EHS, and/or the Director or Assistant Director of Facilities, and not the individual utilizing the energy control procedure being inspected. The periodic inspection is designed to correct any deviations or inadequacies observed.

When lockout is used for energy control, the periodic inspection will include a review, between the inspector and each authorized employee, of that employee's responsibilities under the energy control procedure being inspected. Where tagout is being used for energy control, the periodic inspections will include a review, between the inspector and each authorized and affected employee, of that employee's responsibilities under the energy control procedure being inspected, and the elements set forth under responsibility and training.

15.0 LONG DURATION LOCKOUT/TAGOUT

For long duration lockout/tagout (such as new construction, major repairs, etc.), locks may be applied by maintenance personnel, Site engineers (if work is done by outside contractors), or senior maintenance managers. A tag with a short description of why the equipment is locked out and signed by the employee is attached to the lock. Each employee must attach his/her own lock to the energy isolating device during each time he/she works on the machine or equipment, even though a "Long Duration" lock is attached.

Appendix A

Energy Sources

Type of Energy	Magnitude of Energy	Hazards
1. Electrical		
2. Pneumatic		
3. Hydraulic		
4. Mechanical		

Appendix B

*Authorized Employee*s List

The following University or Portland employees have been trained in the lockout procedures and are authorized to lockout any piece of equipment.

Employee Name	Job Title	Shift

The following University or Portland employees have been trained in the lockout procedures related to the following equipment and may lockout only the following pieces of equipment:
Equipment:

_____

_____

_____

Employee Name	Job Title	Shift

Appendix C

List of Equipment, Location and Isolation Source
Lockout/Tagout Procedures Form
Procedures Form Instructions

LIST OF EQUIPMENT, LOCATIONS AND ISOLATION SOURCES

Equipment	Location	Isolation Means/Source

Appendix C Continues...

Appendix C (continued)

LOCKOUT/TAGOUT PROCEDURES FORM #1

1. **Equipment:**			
2. **General**			
a. **Energy Source(s)**	b. **Magnitude**	c. **Hazard(s)**	d. **Personal Protective Equipment**

3. **Caution!!**	*Shut-down equipment by using normal stopping procedures prior to initiating lockout/tagout procedure.*

4. **Energy Isolating Means**			
a. **Energy Source(s)**	b. **Description of Equipment**	c. **Location**	d. **Lockout/Tagout**

5. **Types of Stored Energy**		
a. **Energy Source(s) with Residual Energy**	b. **Magnitude**	c. **Methods Used to Dissipate Residual Energy**

6. **Types of Equipment to Check to Ensure Disconnections**				
a. **Description of Equipment*** ***See Previous Page for List**	b. ***Authorized Employee***	c. **Location**	d. **Method**	e. **Process / Procedure**

CAUTION: Return operating control(s) to "neutral" or "off" position after each test.

At this point, the equipment is safely locked- and/or tagged-out.

Start-up Procedures:

- After all tools have been removed from the machine(s) or equipment, guards have been reinstalled and University or Portland employees are in the clear, remove all lockout and/or tagout devices in reverse order of installation.
- Operate the energy isolating device(s) in accordance with normal start-up procedure to restore energy to the machine(s) or equipment.

Appendix C Continues...

Appendix C (continued)

Instructions for Completing the Lockout/Tagout Procedures Form

1. **Identify the specific equipment to be locked- and/or tagged-out.**
2. **General (Refer to Appendix G Source/Magnitude Energy Isolating Means List for assistance).**
   d. Identify and list all energy sources.
   e. List magnitude for each energy source.
   f. List associated physical/health hazards relative to each energy source. Examples include electrical shock and compressed gas/fluid.
   g. For each energy source, identify personal protective equipment (PPE), if applicable, necessary to ensure employee safety while performing the procedure.
3. **Caution!!**

   These sections are awareness sections, reminding the *Authorized Employee*(s) performing the lockout/tagout of what procedures need to be performed **prior** to initializing a safe shut-down.
4. **Energy Isolating Means.**
   a. Assign order of importance to energy sources to ensure optimum employee safety.
   b. Describe the equipment which qualifies as an energy isolating device and its associated label.
   c. Describe the specific location of the energy isolating device.
   d. Determine whether a lockout or tagout is appropriate.
5. **Types of Stored Energy.**
   a. Is residual energy present? Assign order of importance to those energy sources which retain "residual energy".
   b. After the lockout/tagout sequence has been performed in the energy isolating means section, identify the residual energy magnitude. NOTE: This may be in the form of electrical capacitance, line pressure (pneumatic, hydraulic, steam, chemical), or mechanical, etc.
   c. Specifically identify the method used to safely dissipate the residual energy for the energy source.
6. **Types of Equipment to Check to Ensure Disconnection.**
   a. Describe the equipment pertaining to the energy source. Examples include: control panel, operator controls, and pneumatic gauge.
   b. List the *Authorized Employee*(s) who would be viewing and/or manipulating equipment to ensure disconnection.
   c. Identify the specific location of the energy source.
   d. List the methods or equipment used to ensure the disconnection.
   e. Describe the process or procedure the *Authorized Employee* would utilize. Examples include: activate toggle switch, no movement should occur, or pneumatic gauge should read 0 psi.

University of Portland

LOCKOUT/TAGOUT PROCEDURES FORM #2

Equipment Picture	Location	Equipment Name	Tasks that require Lockout/Tagout
	Building: Area:		Any maintenance, repair, or other activity that exposes personnel to injury from activation or release of the Hazardous Energy Sources.

Hazardous Energy Types: Circle All That Apply	Electrical	Mechanical	Pneumatic	Hydraulic	Thermal	Other
Energy Magnitude:						
Possible Hazardous Chemicals:	**Review Relevant Safety Data Sheets (SDS)**					

STEP #	PROCEDURE	Picture
1.	Notify the Supervisor, Maintenance Planner and any other affected personnel working in the area that the equipment will be locked out.	
2.	Have the equipment shut down following normal shutdown procedure/practice.	
3.	**Electrical Lockout:** **Follow power cord to electrical outlet and disconnect.** **Verify power is disconnected by attempting start-up.** **Place Lockout Lock and Tag on power cord.**	
4.	**Pneumatic Lockout:** **Remove air-hose from machine using quick disconnect.** **Verify air pressure gauge reads "0."** **Place pneumatic Lockout Lock and Tag on machine's air valve.**	
5.		
6.		
7.		
8.		
9.		
10.		
11.		

STEP #	PROCEDURE	
12.		
13.		
14.		
15.		
16.		
17.	Proceed with maintenance work.	
18.	When the maintenance work has been completed, verify that the equipment has been returned to a safe condition (replace all parts, remove tools, replace guards, etc.)	
19.	Notify the Supervisor, Maintenance Planner and any other affected personnel working in the area that the equipment lockout will be removed.	
20.	Remove the Lockout Locks and Tags on all valves and open the valves. Check for leaks.	
21.	Remove the Lockout Lock and Tag on all electrical sources and switch to ON	

Verified By: _____ **Date Verified:** _____

University of Portland

Appendix D

Employees Authorized For Group Lockout/Tagout

Employee Name	Job Title	Shift

(*Note: single-lock group lockout is prohibited in all industries; all locks must be unique for each qualified individual. See OR-OSHA Admin. Order 2-1990, f. 1/19/90, ef. 3/1/90 and OR-OSHA Admin. Order 12-2001, f. 10/26/01, ef. 10/26/01)

University of Portland

Appendix E

INSPECTION FORM FOR SITE LOCKOUT/TAGOUT PROCEDURES

1. What machine is the crew working on?

2. Is the specific machine or equipment Lockout/Tagout Procedures form present in the immediate work area?

Yes		No		If not, explain:	

3. Has the main power source(s) been identified?

Yes		No		If not, explain:	

4. Other energy sources identified? Describe.

5. Has the machine and/or equipment been tested for inadvertent start-up prior to work being performed?

Yes		No		If not, explain:	

6. Number and names of the University or Portland employees working on machine?

Employee Name	Lock/Tag Attached?				Key On Person?			
	Yes		No		Yes		No	
	Yes		No		Yes		No	

7. Were the locks and tags property identified?

Yes		No		If not, whose were not:	

8. Will the work be completed this shift?

Yes		No		

If no, have arrangements been made to inform the next crew?

Yes		No		

9. Have the extra keys been identified and locked up in the maintenance office?

Yes		No		

If no, have arrangements been made to inform the next crew?

Yes		No		

10. Who made the inspection?

Signature of Supervisor:		Date	Time	
				am/pm

Appendix F

Extra Keys For Lockout

If it becomes necessary to use the extra keys to remove lockout devices from an energy isolating device(s), see Paragraph 1 through 3, "Additional Information" Section 12 of this General Lockout / Tagout Program.

→ *These procedures must be followed step-by-step to ensure the safety of you and your fellow University or Portland employees.*

1.				
	Key Number	Date	Time	Reason for Using Extra Key
	Signature of Supervisor		Signature of Director/Assistant Director	
	Key Returned	Date	Time	Signature, Title
2.				
	Key Number	Date	Time	Reason for Using Extra Key
	Signature of Supervisor		Signature of Director/Assistant Director	
	Key Returned	Date	Time	Signature, Title

Appendix G

Employees Authorized To Instruct Other Employees

Employee Name	Job Title	Shift	Equipment

University of Portland

Appendix H

Lockout/Tagout Decision Matrix

Equipment:	

1. Does the equipment have the potential for stored or residual energy or re-accumulation of stored energy after shut-down which could endanger University or Portland employees?

No		Yes	

2. Will the service or maintenance create hazards for other the University or Portland employees?

No		Yes	

3. The equipment has a single energy source which is readily identified and isolated.

Yes		No	

4. Will the isolation and lockout of that energy source completely de-energize and de-activate the equipment?

Yes		No	

A machine-specific lockout / tagout program IS NECESSARY to protect University or Portland employees engaged in hazardous servicing and maintenance of equipment.

5. Is the equipment isolated from that energy source and locked-out during servicing or maintenance?

Yes		No	

6. Will a single lockout device completely isolate this equipment?

Yes		No	

7. Is the lockout device under the exclusive control of the *Authorized Employee* performing the servicing or maintenance?

Yes		No	

8. Have there been any accidents involving the unexpected activation or re-energization of this equipment while performing service or maintenance?

No		Yes	

A machine-specific, written, lockout/tagout procedure is not required, although the sequence of Lockout or Tagout System Procedure must be followed (i.e. equipment test and return controls to neutral).