

# **Randolph Community College**

## **Control of Hazardous Energy Lockout/Tagout Plan**

Reviewed May 25, 2011

## **CONTROL OF HAZARDOUS ENERGY LOCKOUT/TAGOUT PROGRAM**

### **PURPOSE**

The purpose of this program is to ensure that machines, equipment, and circuitry are isolated from potentially hazardous energy, whether it is steam, electrical, mechanical, hydraulic, or gas to provide a safe working environment for College employees. Lockout or Tagout must occur before employees perform service, maintenance, or renovation. This is important where unexpected start-up could cause personal injury, fire, or equipment damage.

### **POLICY**

All equipment shall be locked out where possible. Where such control is not possible, equipment may be tagged out-of-service. In all instances, equipment shall be made inoperable to protect against possible operation where such operation may cause personal injury or damage. Employees must not attempt to operate any switch, valve, or source of energy that is locked out or tagged out.

### **PROCEDURES**

1. When working on systems that could accidentally be activated, the system shall be locked out or tagged out by use of a safety lockout device and padlock. In addition, a tag shall be used to identify the purpose of the shutdown, the employee involved, the date the unit was removed from service, and when the system may operate again. (See Appendix A)
2. If more than one source of energy is present, all such sources must be locked out or tagged out. Special procedures must be followed to ensure that the equipment is disconnected from an energy management system or emergency generator system that may start or energize the equipment.
3. A Lockout is required on all systems where possible. A Tagout is an acceptable means of protection on systems that are less hazardous. An example of a less hazardous device is one that if started accidentally, would not cause personal injury but would simply startle someone.
4. If the source is electrical, such as a circuit breaker in a panel, the load side conductor shall be removed from the breaker with a tag tied to the breaker as noted in step 1, or the breaker shall be locked out in the "off" position with an approved lockout device.
5. If more than one person is involved in the repair, each person shall install a lock and/or tag to the equipment energy source. An employee may not use the tag or lock of another employee. The employee's supervisor shall have the only duplicate key and is the only other employee authorized to remove a lock or tag of another person.

6. When the equipment has been de-energized and after ensuring that personnel are not exposed to danger, test the equipment to determine if the energy source is indeed isolated. Further tests with a meter will verify if electrical energy has been successfully disconnected. Those electrical units that store electrical charges (capacitors) are also required to be de-energized or isolated (disconnected).
7. When working with hydraulic, steam, or air systems, bleed down the cylinders, block valves with a chain and lock, and attach a “DANGER” tag or sign to the control. In some operations, a “double block and bleed” system may be used to control unwanted energy. Block gears, dies, and other devices capable of movement. Release coiled springs, spring-loaded devices, and secure cams. Place blocks under equipment that might descend, slide, or fall. Place stands or blocks under raised vehicles, vehicle beds, or other equipment to protect against failure of hoists, jacks, or elevating equipment.
8. After servicing, renovation, or maintenance is complete, the area must be checked for tools, parts, and removed guards. After assuring that no personnel are in the danger zone, the lockout or tagout will be removed by the same employee who initially placed it so energy may be restored to the equipment.
9. If the employee who locked out or tagged out the equipment is unavailable, the supervisor may remove the lock or tag if the following conditions are met:
  - a. Verify that the authorized employee who applied the device has left for the duration of the shift and is not at the job site.
  - b. Make reasonable efforts to reach the authorized employee.
  - c. Inform the employee that the lock or tag has been removed and the system is no longer de-energized before the employee resumes work.
10. Employees authorized to use lockout/tagout devices shall have initial training about this program and shall have annual retraining to ensure that the employee understands and follows this program. The training and retraining shall be documented with the training records maintained by the Safety Coordinator. (See Appendix B)
11. Outside contractors are required to follow this policy or provide a similar policy that complies with Occupational Safety and Health Administration (OSHA) Standard 29 CFR 1910.147. Under no circumstances are outside contractors authorized to remove a college lockout/tagout device nor are they allowed to energize a locked out/tagged out system.

## **INSPECTIONS**

The Director of Safety and Emergency Preparedness, in concert with the Maintenance Supervisor, will conduct periodic inspections (at a minimum annually) of the energy control procedures in use at the College. These inspections will be random in nature and could occur at any time energy control procedures are in use. The inspections will be documented.

(Appendix C).

## **REVIEW AND EVALUATION**

This Control of Hazardous Energy (Lockout/Tagout) program will be reviewed and evaluated on an annual basis. The Director of Safety and Emergency Preparedness and the College Safety Team will perform the evaluation. The evaluation will look at the results from the inspections and will review the requirements of 29 CFR 1910.147. After review, changes to the plan will be made as necessary.

# **APPENDIX A**

## LOCKOUT/TAGOUT AND SHUTDOWN PROCEDURES CHECKLIST

This checklist is primarily for the use of Randolph Community College maintenance personnel involved in the servicing or repair of equipment or energy supply systems and controls on the College campus. The College recognizes that during the normal course of usage of equipment, certain minor adjustments or routine maintenance may be required. To the extent that the employee operator handles such adjustments or routine maintenance, this checklist also applies to that employee.

**The following steps must be followed in sequence to properly lockout/tagout and re-establish energy to the affected equipment, energy supply systems, electrical circuitry, or controls. Each time a circuit or piece of equipment is to be serviced, the authorized employee shall follow these steps in sequence, checking them off when complete before proceeding to the next step.**

### APPLICATION OF LOCK/TAGOUT

#### 1. Understand the hazard: (Check all that apply).

##### ELECTRICAL (including battery)

Shock and or burn could result from contact with the exposed conductors, line voltage, or high voltage equipment. Flying parts or fire could result if this circuit is shorted out. Electricity should be controlled at the (circuit breaker), (main switch), or (fuse box).

Located: \_\_\_\_\_

##### PNEUMATIC/HYDRAULIC

High velocity air/liquid impingement can inflict injury to the eyes, ears, and to openings or cuts to the skin. Air/liquid flow can cause small objects to become airborne missiles. Compressed air/fluids should be controlled at the (shutoff valve), (cylinder control valve), or (air/liquid line valve).

Located: \_\_\_\_\_

##### CHEMICAL

Gas or liquid can produce illness or injury through its (toxicity), (flammability), (corrosively), and/or (reactivity). It can be controlled from accidental release by turning the (cylinder valve) and/or (gas/liquid line control valve).

Located: \_\_\_\_\_

## MECHANICAL

The \_\_\_\_\_ can inflict tissue or skeletal injury through (crushing), (laceration), and/or (impalement). It can be controlled through the (main electrical switch), (plug), (circuit breaker), and/or (anti-motion pin).

Located: \_\_\_\_\_

## THERMAL/STEAM

The \_\_\_\_\_ can cause (burns) (fires). It can be controlled by the (main electrical switch), (electrical plug control), (electrical circuit breaker), (electrical fuse box), (steam valve, (fluid line valve), and/or (shielding).

Located: \_\_\_\_\_

## UV

Exposure to ultraviolet rays from the \_\_\_\_\_ can result in burn injuries to the skin and eyes. It can be controlled by the (main electrical switch), (circuit breaker), and/or (shielding).

Located: \_\_\_\_\_

or by using an appropriate shield such as \_\_\_\_\_.

**2. Shut down the (equipment), (circuitry), (supply systems), and (controls) following normal procedures.**

**3. Isolate the source of energy by: (Check all that apply).**

## ELECTRICAL

Locate the main switch box; disconnect circuit breaker to \_\_\_\_\_ in circuit breaker box number \_\_\_\_\_. The correct circuit is number \_\_\_\_\_.

Located: \_\_\_\_\_

(Open the breaker), (open the switch), or (remove the plug). Attach a lockout-enabling device if the circuit cannot otherwise accommodate a padlock. Place plug in a plug lock box.

## VALVE

Locate and close the \_\_\_\_\_ shut-off valve that supplies the \_\_\_\_\_ to the \_\_\_\_\_. Apply the appropriate source of energy isolation device (ball valve), (gate valve), (donut), (handle), and/or (chain) with lock.

## MECHANICAL/STORAGE/POTENTIAL ENERGY

(Block) and/or (pin) the \_\_\_\_\_ with a \_\_\_\_\_. Apply a lockout enabling device to prevent removal of the \_\_\_\_\_.

- 4. Secure the lockout by attaching a personal lock and completed tag to the lockout-enabling device. If more than one person will be performing the work, each must apply his own lock to a multiple lock device.**

- 5. Release all stored energy in the \_\_\_\_\_.**

If there is a heat exposure, allow the \_\_\_\_\_ to cool.

Release any (type) \_\_\_\_\_ pressure trapped between the shut-off and the equipment.

Purge the system (drain) and/or (purge) all \_\_\_\_\_ trapped between the shut-off valve and the equipment.

Check to ensure the \_\_\_\_\_ has come to a complete stop. Discharge any large capacitors and ensure they remain shorted.

- 6. Verify that no potential energy can be released.**

Verify that no voltage is present by testing the \_\_\_\_\_ with (voltmeter) and (operating switch).

Verify that no \_\_\_\_\_ can \_\_\_\_\_.

## RELEASE FROM LOCKOUT/TAGOUT

- 1. Inspect the \_\_\_\_\_ and the surrounding area following completion of work for loose tools, parts, correct valve settings, system integrity, and exposed conductors. Check that all machine guards are in place and reconnected if applicable.**
- 2. Notify others in the area that the \_\_\_\_\_ is about to be made operational and returned to service.**
- 3. Remove personal lock, tag, and lockout enabling device from \_\_\_\_\_. The same person who applied the tag and lock must perform this step.**

## TYPES OF ENERGY CHECKLIST

ENERGY TYPE	HAZARD	MAGNITUDE	CONTROL
Electrical	Shock	110 VAC	Main Switch
	Burn	220 VAC	Plug Control
	Fire	208 VAC/30	Fuse Blocks
			Shielding
Pneumatic/Hydraulic	Mechanical/ Pinch Points	Moderate	Air Line Valve
	Crush	Slight	Gas Cylinder Valve
Chemical (Gas)	Flammable	Slight	Cylinder Valve
	Corrosive	Moderate	Gas Line Valve
	Toxic	High	
	Reactive		
Chemical (Liquid)	Flammable	Slight	Valve
	Corrosive	Moderate	Flange Plate
	Toxic	High	
	Reactive		
Mechanical	Shaft in Motion	Slight	Main Electrical Switch
	Moving Parts	Moderate	Plug Control
	Crushing	High	Shielding
	Laceration		Blocking
	Impalement		Anti-motion Pin
UV	Skin and Eye Burns	Slight	Shielding
		Moderate	Main Switch
		High	Plug Control
			Circuit Breaker
Electromagnet	Strong Field	Slight	Main Switch
		Moderate	Plug Control
		High	Circuit Breaker
Thermal	Burns	Moderate temperature	Main Switch Plug Control
		High Temperature	Steam Valve
		Cryogenic	Fluid Line Valve

## **APPENDIX B**

## LOCKOUT-TAGOUT TRAINING PROGRAM

**Name** \_\_\_\_\_

Division/Department \_\_\_\_\_

Job Title \_\_\_\_\_

The named employee has completed Lockout-Tagout training presented by:

\_\_\_\_\_ on \_\_\_\_/\_\_\_\_/\_\_\_\_  
(trainer) (date)

The training included the following elements:

1. The reasons for a lockout/tagout program.
2. The need to ensure the equipment cannot be accidentally re-energized.
  - a. By tagging all operations in the OFF or STOP position.
  - b. Deactivating and tagging out the control circuits at the automatic controls.
  - c. Deactivate and lockout the control circuit at the breaker or at the main control ON - OFF switch.
3. The only certain way to ensure the circuit is deactivated is at the motor disconnect. To verify the disconnect, the circuit should be tested at the load side of the control with a tester that has just been tested on a known energized voltage source.
4. The requirement to disconnect and lockout all energy sources.
5. Attempt to activate the equipment to verify the lockout has de-energized the equipment and that all secondary energy sources are controlled.
6. The lockout procedure will be in force until all work is completed and guards are reinstalled as required.
7. Before activation, all effected employees will be informed the equipment will be put back in service.
8. Re-activate all switches and systems, remove any blanks or blinds, close any opened bleed valves, and ensure that all disconnected secondary energy sources are re-activated and operational.
9. Make certain the machine performs as intended by observing it in operating mode.
10. Respect the lockout/tagout system used by others.

Employee signature \_\_\_\_\_

## **APPENDIX C**

## **ENERGY CONTROL INSPECTION**

**To be completed during LOTO procedure by Maintenance supervisor, Assistant Director or Director of Facilities.**