Clear Form

Attachment 2 – UC Berkeley – EI-LOTO "Equipment Specific" Procedure

Equip. Name: _____ **Building:** _____ **Location/Room Number:** _____

Describe scope of work here:

Instructions:
Follow the steps to create a written sequence for de-energizing, lockout, testing, and start-up of equipment requiring energy isolation. Use completed procedure for safety meetings / training for the equipment-specific lockout process. Discuss with workers how equipment energy isolation – LOTO is applied to this specific equipment during these planned job / tasks. Also, discuss communication methods on the job site.

Step 1: Survey and check off all Energy Sources.

Step 2: Note Magnitude and type of each energy source.

Step 3: Note Device and Location of each energy disconnecting / isolation source / method.

		1: ENERGY SOURCE	2: MAGNITUDE / TYPE	3: ISOLATION DEVICE / LOCATION / METHOD
☐		ELECTRICITY – Main Power	Amps: _____ Volts: _____ # Phase: ___	
☐		ELECTRICITY – Control circuit(s)	Amps: _____ Volts: _____ # Phase: ___	
☐		BATTERY / SOLAR / ALT POWER AC/DC/PH: _____	Amps: _____ Volts: _____ # Phase: ___	
☐		COMPRESSED AIR / GASES	PSI: _____ Gas Type: _____	
☐		STEAM / CONDENSATE	PSI: _____ Source: _____	
☐		FLUID UNDER PRESSURE	PSI: _____ Source: _____	
☐		HEAT / COLD + / - C° or + / - F°	Temp: _____ Source: _____	
☐		VACUUM CHAMBER / PIPING	Hg": _____ Source: _____	
☐		FUEL(S) – SOLID / LIQUID / GAS	Volume: _____ Fuel: _____	
☐		ROTATING WHEEL / FAN / DRIVE	Details: _____	
☐		SUSPENDED WEIGHT	Details: _____	
☐		MECHANICAL OTHER: _____	Details: _____	

Step 4: List sequence of Energy Isolation (Number 1 up to 12).

Instructions (continued): *Isolate energy sources in sequence. Assure each worker installs their own lock on each disconnect. Supervisor / Authorized Person installs warning tags. Verify Energy Isolation prior to starting work. When testing / jogging equipment, follow program procedures on the back of this form. When restoring equipment to operation, reverse isolation sequence unless otherwise discussed / approved by the Project Supervisor. Use Personal Protective Equipment and safety equipment as noted below during work activities. Contact EH&S for technical support and special concerns at 510-642-3073.*

Step 5: Check off all PPE and safety equipment to be used for Energy Isolation.

	PPE TO BE WORN DURING WORK
☐	BOOTS: ☐ STEEL TOE ☐ RUBBER ☐ OTHER
☐	FACE: ☐ GOGGLES ☐ FACE SHIELD ☐ WELD GEAR
☐	FALLS: ☐ SAFETY HARNESS ☐ LANYARD & LINE
☐	GLOVES: ☐ LEATHER ☐ RUBBER ☐ INSULATED
☐	RESPIRATOR: ☐ DUCT ☐ CHEMICAL
☐	SPLASH: ☐ APRON ☐ WET GEAR ☐ OTHER
☐	THERMAL PROTECTION: ☐ HEAT ☐ COLD
☐	OTHER: _____

	SAFETY EQUIPMENT TO BE USED DURING WORK
☐	FIRE: ☐ FIRE EXTINGUISHER ☐ FIRE WATCHER
☐	☐ REMOVE FLAMMABLES ☐ REMOVE COMBUSTIBLES
☐	MECHANICAL: ☐ BLOCKS ☐ BARS ☐ BARRICADES ☐ CHAINS
☐	PRESSURE: ☐ BLEEDERS LOCKED OPEN & TAGGED
☐	SHIELDS: ☐ ARC CURTAIN ☐ HEAT BLANKET
☐	STEAM: ☐ LINES BLINDED ☐ LINES TAGGED
☐	TOOLS: ☐ LONG HANDLE ☐ INSULATED
☐	UTILITIES: ☐ VALVES ☐ SWITCHES ☐ LOCKED & TAGGED

PROCEDURE PREPARED BY:

(PRINT NAME)

SIGNATURE DATE

ANNUAL REVIEW COMPLETED BY:

(PRINT NAME)

SIGNATURE DATE

Standard Energy Isolation LOTO Procedure

1. All maintenance personnel are issued a suitable lock (or locks for multiple energy sources). Each lock has the individual worker's name or other identification on it. Each worker has the only key to the lock / lock set.
2. The Authorized Person checks to be sure that no one is operating the machinery BEFORE turning off energy sources. All persons in the area, and especially the machine operator and project supervisor, are informed before the energy sources are being turned off because unexpected sudden loss of power could cause an accident.
3. Steam, air, and hydraulic piping or tanks must be bled, drained, and/or brought to atmospheric pressure and locked "open" to assure no pressure or vacuum in piping or in reservoir tanks.
4. Gas cylinders must be locked 'closed' and if possible disconnected from distribution piping.
5. Any mechanical component that could roll, shift or otherwise move, such as springs, counterweights, wheels, fan blades, etc. must be barred or blocked.
6. Each person who will be working on the machinery must put a lock on each of the machine's lockout device(s). Each lock must remain on the machine until the work is completed. Only the worker who placed the lock may remove their lock.
7. The Supervisor or "Authorized Person" places a tag on each lock-out location.
8. All energy sources which could activate the machine must be locked or blocked out following an equipment-specific Energy Isolation Procedure developed for that equipment. (Other side)
9. All disconnects must be tested to be sure that all energy sources to the machine are off.
10. Electrical circuits must be checked by qualified persons with proper and calibrated electrical testing equipment. Stored energy in electrical capacitors must be safely discharged.
11. CAUTION: Return disconnects and operating controls to the "off" position after each test.
12. Attach accident prevention tags which give the reason for placing the lock/tag, the name of the person placing the lock/tag, how they may be contacted, and the date and time the lock/tag was placed.

Testing / Adjusting Equipment during Lockout

In many maintenance and repair operations, machinery must be tested and therefore energized before additional maintenance work can be performed. For such situations, this procedure must be followed:

1. Clear all personnel to safety.
2. Clear away tools and materials from equipment.
3. Remove blocks and lockout devices and re-energize systems, following the established safe procedure.
4. Proceed with tryout or test.
5. Shut off all energy sources reinstalling lockouts on energy sources, reinstall blocks, bleed all pressure systems and verify all energy sources de-energized prior to continuing work.

Equipment design and performance limitations may dictate that effective alternative worker protection be provided when the established lockout procedure is not feasible. If machinery must be capable of movement in order to perform a maintenance task, workers must use extension tools, personal protective equipment and other means to protect themselves from moving parts and potential injury.

Restoring Equipment to Service

After the work is completed and the equipment is ready to be returned to normal operation, this procedure must be followed:

1. Remove all non-essential items.
2. See that all equipment components are operationally intact, including reinstalling guards and safety devices.
3. Repair or replace defective guards before removing locks.
4. Remove each lockout device using the correct removal sequence.
5. Make a visual check before restoring energy to ensure that everyone is physically clear of the equipment.

Each lock is removed by the authorized person that applied it, or under his/her direct supervision. If the authorized person is absent from the work place then the lock or tag can be removed by a qualified person designated to perform this task provided that the immediate supervisor:

1. Verifies that the qualified person is not present and therefore unable to remove the lock;
2. Makes all reasonable efforts to inform the qualified person that the lockout/tagout device has been removed; and
3. Ensures that the qualified person knows their lockout/tagout device has been removed before their work resumes.

Finally, notify any "Affected Person(s)" that the equipment has been restored to its operational state.

Joint Projects

If University personnel and contractor personnel are working on the same piece of equipment, each work team installs their own hasp and locks on each energy source. The University provides the hasps that University personnel install their locks on, and the Contractor provides their hasps and locks that their personnel install / use.