This Procedure can be found in [***Procedures***](https://ehs.ucop.edu/procedures) using the name:

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| --- | --- |
| **Follow these steps** to create a written sequence for de-energizing, lockout, testing, and startup of equipment requiring energy isolation.1. Survey and check oﬀ all energy sources
2. Note the magnitude and type of each energy source
3. Note the device and location of each energy disconnecting/isolation source/method.
 | 1. List the sequence of energy isolation (number from 1 up to 12)
2. Check oﬀ all PPE to be used for energy isolation
3. Check oﬀ all safety equipment to be used for energy isolation
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|  |
| **Equipment Name:** |  | **Building:**  | **CAAN:**  | **Room #** |
| Exact Location Description: |  |
| Describe Scope of Work: |  |
|  |
| **4.** | **1. Energy Source** | **2. Magnitude/Type** | **3. Isolation Device/Location/Method** |
|  |  ELECTRICITY– Main power | Amps: | Volts: | # Phase AC or DC |  |
|  |  ELECTRICITY– Control circuit(s) | Amps: | Volts: | # Phase AC or DC |  |
|  |  BATTERY / SOLAR / ALT POWER | Amps: | Volts: | # Phase AC or DC |  |
|  |  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 5:** Mark and check off all PPE and safety equipment to be used for Energy Isolation. | **PROCEDURE PREPARED BY:** |
| **[x]** | **PPE TO BE WORN DURING WORK** | **[x]** | **SAFETY EQUIPMENT TO BE USED DURING WORK** |
|  | Eye Protection |  | Goggles |  | Face Shield |  | Weld Gear |  | Fire Extinguisher |  | Fire Watcher | (PRINT NAME) |
|  | Boots |  | Steel Toe |  | Rubber |  | Other |  | Lines Blinded & Tagged | SIGNATURE / DATE: |
|  | Gloves |  | Leather |  | Rubber |  | Insulated |  | Valves / Switches – Locked & Tagged |
|  | Respirator |  | Dust |  | Chemical |  | Remove Flammables / Combustibles | **ANNUAL REVIEW COMPLETED BY:** |
|  | Thermal |  | Heat |  | Cold Protection |  | Bleeders Locked Open & Tagged |
|  | Apron |  | Wet Gear |  | Other |  | Shields |  | Arc Curtain |  | Heat Blanket | (PRINT NAME) |
|  | Safety harness |  | FR Lab Coat |  | Blocks |  | Barricades |  | Bars |  | Chains | SIGNATURE / DATE: |
|  | Other: |  | Tools |  | Insulated |  | Long Handle |

Return this form to EH&S for review.

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| **Standard Energy Isolation – Lockout / Tagout (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 Qualified 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 turned off because an 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 chained, 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 “Qualified Person” places a tag on each lock-out location.
8. All energy sources that could activate the machine must be locked or blocked out following an equipment-specific EI-LOTO Procedure developed for that equipment. (Other side)
9. All disconnects must be tested to ensure 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 LOTO** | 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 the equipment.
3. Remove blocks and lockout devices and re-energize systems, following the established safe procedure.
4. Proceed with the tryout or test.
5. Shut off all energy sources, reinstall lockouts on energy sources, reinstall blocks, bleed all pressure systems, and verify all energy sources are 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 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:**Restoring Equipment to Service**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 qualified person who applied it, or under his/her direct supervision. If the qualified person is absent from the workplace, 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 equipment has been restored to its operational state.
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| **Joint Projects****Joint Projects****Joint Projects** | If University personnel and contractor personnel are working on the same piece of equipment, each work team installs its 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. |