



**Santa Clara
University**

Lock Out/Tag Out (LOTO) Safety Program

**Santa Clara University
500 El Camino Real
Santa Clara, CA 95053**

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Lock out/Tag out (LOTO) Safety Program

1. References

- [8 CCR 3314](#) – Control of Hazardous Energy for Cleaning, Repairing, Servicing, Setting-Up
- [8 CCR 2320.4](#) – De-Energized Equipment or Systems
- Attachment 1 – Hazardous Energy Control Tag Criteria
- Attachment 2 – Inventory of Single Source Equipment
- Attachment 3 – Single Source Isolation Procedure
- Attachment 4 – Inventory of Two or More Energy Sources
- Attachment 5 – Group Lockout/Tagout Procedure
- Attachment 6 – Multiple Source Energy Isolation Procedure
- Attachment 7 – Periodic Lockout/Tagout Procedure Inspection Form

2. Purpose

The purpose of this program is to prevent injury to contractors, faculty, staff and students from the unexpected energizing, start-up, or release of stored energy.

3. Applicability

This program provides the minimum requirements for SCU Staff, Faculty, Students and Contractors for safe LOTO practices also known as Energy Isolation.

4. Definitions

Affected Person – A person who works near or on equipment on which cleaning, repairing, servicing, setting-up or adjusting operations are or may be performed under this Energy Isolation Program.

Appropriate Department Director – The Director of the department which selects Authorized Person(s) and conducts LOTO.

Authorized Person – A person who locks out and/or tags out specific machines or equipment in order to perform cleaning, repairing, servicing, setting-up, and adjusting operations on that machine or equipment. An Authorized Person must be approved as such by their Supervisor, trained on identifying and controlling hazardous energy as well as application of this program, provided Energy Isolation locks and tags, and be familiar with all equipment components prior to conducting work on equipment. An Authorized Person may develop written equipment-specific energy isolation procedures with authorization documented and placed in an Authorized Person's permanent file.

Blind – Another form of blocking is the placement of a blind. A blind is a disk of metal placed in a pipe to ensure that no air, steam, or other substance will pass through that point if the piping system is accidentally activated/pressurized.

Blocked – Equipment is blocked by inserting a mechanical device to prevent inadvertent movement. Potential energy that may need to be blocked can come from suspended or rolling parts subject to movement or gravity, may be energy stored in springs, can cause movement due to air flow, etc. The block must be strong enough to support the entire load of the equipment components if the equipment moves. Blocks should have chain or some other means that can lock the block in place.

De-energize/Disengage – There is a difference between turning off a machine and actually disengaging or de-energizing a piece of equipment. When a control switch is turned off, the control circuit is off. However, there is still electrical energy at the switch, and a short in the switch or someone inadvertently turning on the machine may start the machine running again. In addition, control circuits may only control power relays on main power panels. Prior to maintaining, adjusting or repairing equipment, main power and control circuit power must be de-energized/disengaged. To de-energize/disengage equipment, the fuses/breakers must be removed or turned 'off' and the electrical box containing the fuse/breaker locked shut. A knife switch disconnect locked in the 'off' position is also considered de-energized.

Lockout/Blockout – Any energy source – whether electrical, hydraulic, mechanical, compressed air, or any other source that might cause unexpected movement – must be disengaged or blocked, and electrical sources or pressurized fluids/gases must be de-energized, bled to atmosphere, and locked or blinded in the off position.

Testing Equipment – Once the equipment is locked, blocked and/or blinded, it must be TESTED to make sure the machinery is, in fact, de-energized. CAUTION: Return disconnects and operating controls to the off position after each test.

5. De-energizing Methods and LOTO Devices

Electricity:

- Most common method is the main electrical disconnect switch has one opening where a single lock can be placed.
 - If more than one employee works on the equipment, a lockout adaptor or multiple-lock hasp, suitable for the installation of several locks must be used, enabling all workers to lock out the machine with their individual locks.
 - If the switches are in a metal box, the box itself must be locked out in the closed position.
- If a fuse was removed in order to de-energize the equipment, the fuse box must be locked. If the controls are in a metal-covered box, a common hasp can be welded or riveted to the door, along with a lock staple. Then the switch can be opened and the door closed and padlocked. Fuse boxes can also be locked in this way. In some equipment, an electric control circuit will

actuate a main power circuit. In such situations, both circuits must be locked and tagged out before safe-work can proceed.

Compressed Air/Gasses/Hydraulic Fluids/Steam/Pressurized Water:

- Machines activated by compressed air or steam will have valves that control movement. These valves will need not only to be locked out, but also bled to release any residual pressure.
- Physically disconnect the equipment from the supply plumbing if possible. If not possible, use double valves or blind off supply lines with appropriate flange plates or pipe caps.

Mechanical Energy:

- Blocks are placed under raised lifts or any equipment that might inadvertently move by sliding, falling or rolling. Blocks, special brackets, or special stands such as those commonly used under raised vehicles, must be used.
- Before installing blinds or blocks, steam, air, or hydraulic lines are bled down to return the system to atmospheric pressure and then blinds/blocks are installed. Coiled springs, spring-loaded devices, or suspended loads are released so that their stored energy will not result in inadvertent movement. Bleed valves must be locked "open".
- Examples of blocks include:
 - Support rods for counterweights or elevated components
 - Bar through spokes of a wheel, flywheel or fan blades
 - Wedge-shape wheel-chalk for rolling components

When a Lock or Tag is Required:

Equipment must be locked out or tagged out whenever:

- Maintenance or service work is performed to assure that persons are not exposed to the unexpected energizing or start-up of the equipment or release of hazardous energy;
 - **Note: Maintenance and service are defined as constructing, installing, setting up, adjusting, inspecting, modifying, and maintaining and or servicing machines and equipment. These activities may also include lubrication or cleaning of machines or equipment and making adjustments or tool changes,**
- Before removal or bypassing of any guard or safety device, or
- When a person is required to place any part of their body into a "point of operation" or other danger zone that exists during a machine operation cycle.
- **Exceptions to Lockout/Tag-out:**
 - Normal production activities in which lockout cannot be feasibly conducted because the nature of its operation, or if the operation is routine. Safeguards must be provided to assure that the work performed using alternative measures will provide effective protection.

- Adjustments that need to be made while equipment is running.
- Cord and plug type of equipment (operator has 'control' of cord). Removal of plug from outlet is sufficient.

Approved Lockout -Tagout Devices

Safety locks will be provided or issued to each authorized employee to be used only for lockout purposes.

- Safety locks will be standardized, approved and supplied by the Facilities Stockroom in Building 604
- One key will be given with the safety lock. Any duplicate keys will be destroyed. The making of duplicate keys is strictly prohibited.
- Each lock will be identified with the person's name engraved on the face and/or with a tag
- Locks will not be used for any purpose other than lockout and locks of other types will not be used for the purposes of lockouts.
- Multiple lock adapters will be available for all jobs requiring more than one lock.
- Tags will be provided or issued to each authorized employee to be used only for tagout purposes. Tagout only tags must use tielocks or equivalent, having a minimum unlocking strength of at least 50 lbs.

NOTE: Tags will not be used unless locks cannot be physically installed to isolation devices. These instances must be brought to the Supervisor's attention and efforts will be made to make engineering changes to allow locks to be utilized. Whenever replacement or major repair, renovation or modification of a machine or equipment is performed, and whenever new machines or equipment are installed, energy isolation devices for such machines and equipment must be capable of being locked out. Safety Locks and Tags used for lockout –tagout purposes will not be used for out of service equipment or for other extended purposes to limit access to changes in settings.

- System locks will be made available to authorized Supervisors for the purpose of providing lockout continuity across multiple shifts and/or for coordinating complex lockout procedures involving multiple teams or interface with site contractors.
 - System locks are keyed alike and may not be used for personal lockout under any circumstances.
 - System locks cannot be installed without a multiple locking hasp and tag. Employee's performing lockout will apply safety locks to the hasp (and hold single key) for the duration they are exposed to potentially hazardous energy.
 - System locks can remain beyond a single shift and may be removed by persons other than the installer, provided the reasons for application are clearly understood by the remover and no hazards remain.

6. Reporting

Periodic Inspections

- Inspections will be made periodically (at least annually) by appropriate department Directors or their designated authorized employees and records maintained certifying that all equipment-specific lockout procedures are being performed correctly.
- The records will include the equipment or machine on which the energy control procedure was inspected, the date of the inspection, and each of the employees included in the inspection and the authorized employee performing the inspection

Annual Reviews

EHS will conduct a review at least annually of the written program, equipment inventory, employee training, and specific operating procedures to ensure system currency.

7. Training and Awareness

- **All Employees** - Receive awareness training to not disturb LOTO equipment unless authorized to do so.
- **Authorized Personnel** - Receive detailed LOTO training before conducting any LOTO actions.
- **Contractors** -Receive orientation training in accordance with SCU's Contractor Safety Program.

8. Roles / Responsibilities

The following are the SCU Roles and Responsibilities in regards to LOTO:

Group	Responsibilities
Authorized Persons	<ul style="list-style-type: none">• Only workers who are –Authorizedll may conduct LOTO processes.• A worker must be authorized when their duties include:<ul style="list-style-type: none">• performing cleaning, repairing, servicing, setting-up and adjusting operations on equipment requiring LOTO for safe work activities. The worker’s Supervisor determines qualifications for authorization based upon the Supervisor’s knowledge of the authorized person’s skills, and the energy sources on the equipment.• All Authorized Person(s) must be trained as outlined in the Training section of this program, be provided appropriate tools to conduct LOTO, and follow all procedures outlined in this program.• Authorized Person(s) may develop energy isolation procedures and conduct annual audits on existing procedures as detailed below.• A person may be considered Authorized with respect to certain equipment and safe-work methods on specific equipment, but not authorized for another equipment/location within the same Department. It is the responsibility of the Authorized Person’s Supervisor to determine limitations of Authorization for each and every person working under their direction, and document this on

Employees, Faculty, Academic Staff, and Students	<ul style="list-style-type: none"> Receive awareness training to not remove LOTO locks, barriers or tags.
EHS	<ul style="list-style-type: none"> Conduct annual review of LOTO Program
Director of Facilities	<ul style="list-style-type: none"> Reviews results of the annual LOTO Program review and monitors the resolution of any identified issues.

10. Program Review Record

Name	Title	Department
Dave Mathe	EHS Manager	EHS
Greg Davis	Supervisor	Facilities
Ralph Fitzsimmons	Supervisor	Utilities

11. Program Approval

<i>Signature on file in the EHS Office</i>	
Signature	Date: 02/20/2018
Sean P. Collins Director – Environment, Health and Safety	

12. Revision History

No.	Date	Responsible Person	Revision Description
1	06/01/2017	Dave Mathe	Update Attachments
New	07/06/2010	Joe Sugg	New