

April 30, 2016

## LOCKOUT/TAG-OUT ENERGY CONTROL PROGRAM

**1. PURPOSE.** This procedure establishes performance requirements for the control of energy during servicing and/or maintenance of machinery and equipment at VASTLHCS at John Cochran and Jefferson Barracks Divisions. This procedure shall be used to ensure that machines or equipment are stopped, isolated from all potentially hazardous energy sources and locked out before employees perform any servicing or maintenance where the unexpected re-energizing or start-up of the machine or equipment or release of stored energy could cause injury or damage equipment.

**2. POLICY.** All Facility Engineering Service (FES) employees are required to comply with the restrictions and limitations imposed upon them during the use of lockout. The authorized employees are required to perform the lockout in accordance with this procedure. All employees; upon observing a machine or piece of equipment which is locked out to perform servicing or maintenance, shall not attempt to start, energize, or use that machine or equipment. Disciplinary action will be taken for violation of the above. All shop employees are considered Authorized Employees. Shop supervisors will identify all machines or equipment that utilize or store energy. Shop supervisors will establish, enforce and review triennially written procedures for specific equipment types.

### **3. ACTION.**

#### a. Definitions:

(1) Affected Employee: An employee whose job requires him/her to operate or use a machine or equipment on which servicing or maintenance is being performed under lockout or tag-out, or whose job requires him/her to work in an area in which such servicing or maintenance is being performed.

(2) Authorized Employee: A person who locks or implements a tag-out system procedure on machines or equipment to perform the servicing or maintenance on that machine or equipment. An authorized employee and an affected employee may be the same person when the affected employee's duties also include the performing maintenance or service on a machine or equipment, which must be locked, or a tag-out system implemented.

(3) Capable of Being Locked Out: An energy isolating device will be considered to be capable of being locked out either if it is designed with a hasp or other attachment or integral part of which, or through which, a lock can be affixed, or if it has a locking mechanism built into it. Other energy isolating devices will also be considered to be capable of being locked out, if lockout can be achieved without the need to dismantle, rebuild, or replace the energy-isolating device or permanently alter its energy control capability.

(4) Energized: Connected to an energy source or containing residual or stored energy.

(5) Energy Isolating Device: 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 ungrounded supply conductors and, in addition, no pole can be operated independently; a slide 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 circuit type devices.

(6) Energy Source: Any source of electrical, mechanical, hydraulic, pneumatic, chemical, thermal, or other energy.

(7) Hot Tap: A procedure used in the repair, maintenance, and services activities which involves welding on a piece of equipment (pipelines, vessels, or tanks) under pressure, in order to install connections or appurtenances. It is commonly used to replace or add sections of pipeline without the interruption of service for air, gas, water, steam, and petrochemical distribution systems.

(8) Lockout: The placement of a lockout device on an energy-isolating device, in accordance with established procedure, ensuring that the energy isolating device and the equipment being controlled cannot be operated until the lockout device is removed.

(9) Lockout Device: A device that utilizes a positive means, such as a lock with single key, to hold an energy isolating device in the safe position and prevent the energizing of a machine or equipment.

(10) Servicing and/or Maintenance: Work place activities such a construction, installing, setting up, adjusting, inspecting, modifying, maintaining, and/or servicing machines or equipment. These activities include lubrication, cleaning, or un-jamming of machines or equipment and making adjustments or tool changes, where the employee may be exposed to the unexpected energizing or startup of the equipment or release of hazardous energy.

(11) Setting Up: Any work performed to prepare a machine or equipment to perform its normal production operation.

(12) Tag-out: The placement of a tag-out device on energy isolation devices, in accordance with an established procedure, to indicate that the energy isolating device and the equipment being controlled may not be operated until the tag-out device is removed.

(13) Tag-out Device: A prominent warning device, such as a tag and a means of attachment, which can be securely fastened to any energy isolating device in accordance with an established procedure, to indicate that the energy isolating device and the equipment being controlled may not be operated until the tag-out device is removed.

b. PROCEDURES FOR LOCKOUT: The following lists the steps to include in the lockout procedures for machines and equipment. Do not use generalities; rather, identify specific information for each type of machine or equipment. An Energy Control Procedure (ECP) form

will be used to establish an orderly shutdown and lockout procedure. The form is in Attachment B. Work on cord and plug connected electric equipment which can be unplugged does not require an ECP.

(1) Shutdown the equipment.

(a) The Authorized Employee will notify all Affected Employees of the equipment to be locked out that the equipment must be shut down and locked out to perform the servicing or maintenance. On the ECP, list the job title(s) of Affected Employees and method of notification.

(b) The Authorized Employee will refer to the appropriate ECP to identify the type and magnitude of the energy source(s) that need to be isolated. FES shop supervisors shall train the Authorized Employees to identify and understand the energy hazards and how to control the energy. The ECP shall list all types and magnitudes of energy associated with the equipment.

(c) If the machine or equipment is operating, shut it down by the normal stopping procedure (e.g. depress stop button, open switch, close valve, etc.). Identify the specific normal stopping procedure on the ECP.

(2) Isolate the Energy.

(a) De-activate the energy isolating device(s) such that the equipment is isolated from all energy sources. List the types and locations of energy isolating devices on the ECP (e.g. switches, circuit breakers, line valves, or blocks--any mechanical device that physically prevents the transmission or release of energy, etc.).

(b) Lock out the energy isolating device(s) with assigned individual lockout devices. List the type of lockout device required on the ECP.

1 Individual locks should be issued to each Authorized Employee or employee that performs work on locked out equipment. The lock shall be uniquely identified for the individual with one key.

2 Department locks should be used for equipment systems that have more than one point of energy isolation. Keys of department locks in use shall be placed in a lock box that the Authorized Employees and employees performing work on the equipment will place their lock.

3 For de-energized conductors or parts of electrical equipment only: If a lock cannot be applied, a tag may be used by the Authorized Employee. The tag must be supplemented by at least one additional safety measure that provides a level of safety equivalent to that obtained by the use of a lock. List the acceptable safety measures on the ECP (e.g. the removal of an isolating circuit element, blocking of a controlling switch, or opening of an extra disconnecting device, etc.).

(c) Stored or residual energy must be released in a controlled manner (e.g. bleeding down pressure, grounding capacitors, etc.) or restrained (e.g. blocking elevated components, reposition components, etc.) List the type of stored energy and the method of dissipation or restraint in the ECP.

(3) Verification of energy isolation (try out).

(a) Ensure that no personnel are exposed to the hazards of the equipment.

(b) Verify the isolation of the equipment by operating the push button or other normal operating control(s) or by testing to make certain that equipment will not operate. List the try out methods and locations on the ECP. CAUTION: Return operating control(s) to neutral or "off" position after verifying the isolation of the equipment.

1 For de-energized conductors or parts of electrical equipment only: An authorized person (one who is familiar with the construction and operation of the equipment and the electrical hazards involved) shall use test equipment to test the circuit elements and electrical parts of equipment to which employees will be exposed and shall verify that the circuit elements and equipment parts are de-energized. The test shall also determine if any energized condition exists as a result of inadvertently induced voltage or unrelated voltage back-feed even though specific parts of the circuit have been de-energized and presumed to be safe. If the circuit to be tested is over 600 volts, nominal, the test equipment shall be checked for proper operation immediately before and immediately after this test. List the authorized person and the testing instrument to be used on the ECP.

(c) The machine or equipment is now locked out.

(4) Restoring equipment to service. List the following steps on the ECP.

(a) Check the equipment and the immediate area around the equipment to ensure that nonessential items have been removed and that the equipment components are operationally intact.

(b) Check the work area to ensure that all employees have been safely positioned or removed from the area.

(c) Verify that the controls are in neutral.

(d) Remove the lockout devices and re-energize the machine or equipment.

(e) Verify proper operation (e.g. no leaks, issues, etc.). Lock back out and repair as needed.

(f) Notify affected employees that the servicing or maintenance is completed and the machine or equipment is ready for use.

c. **FORCE REMOVAL OF LOCKS:** When an employee has left his lock and tag on equipment for an unknown reason and it must be removed. The following steps should be taken:

(1) If the employee has left the medical center, every effort shall be made to contact the individual to determine the reason for leaving lock and tag.

(2) If the employee can't be located on station or at home, the supervisor of the employee must check out the equipment and make sure it is safe to remove lock and tag. The supervisor will fill out the backside of the tag and sign it.

(3) After the lockout/tag-out system has been forcibly removed, continue the *restoring equipment to service* procedure.

d. **GROUP LOCKOUT/TAGOUT:** When servicing or maintenance is performed by more than one authorized employee, each shall place their own lockout/tag-out device on the energy isolating device(s) by utilizing a multiple lockout device, which accepts multiple locking devices. Primary responsibility is vested in an Authorized Employee for a set number of Authorized Employees working under the protection of a group lockout/tag-out system, who will coordinate affected work forces and ensure continuity of protection to all personnel. The shop supervisor is the Authorized Employee where the multiple lockout devices are used by the same shop. For several crafts or shops, the General Maintenance and Operations Foreman or assigned designee has the responsibility to protect all shop personnel under the multiple lockout devices.

e. **INFORMATION ON TAGOUT:** The following information is to be documented on the tag-out:

	EXAMPLE
Authorized Employee Name	John J. Jones
Position	Electrician
Type/Location of Equipment	Electric Oven, Room 2A122
Department and Extension Number	Engineering Service, Ext. 3456
Time	1:50 p.m.
Date	October 1, 2000

(f) **LOCKOUT PROCEDURE FOR CONTRACTORS:** In situations where the contractor requires a lockout, the Project Engineer will follow this procedure:

(1) Notify the General Maintenance and Operations Foreman of planned lockout. Lockouts that disrupt the operation of utility systems must be scheduled according to MCM-FES-138-6, Utility and/or Service Interruption Procedures.

(2) The Project Engineer assigned to the project shall ensure that contractors adhere to procedures outlined in this SOP for lockout and tagging of equipment. This shall be accomplished by reviewing the lockout/tag-out procedures at all pre-construction briefings. The review shall consist of the VA representative and contractor ensuring that all workers who are authorized or affected by any shutdown are knowledgeable of each specific procedure prior to

deactivation and re-activation of the equipment. Any worker has the right to verify energy isolation on the equipment they are working on.

g. **SHIFT AND PERSONNEL CHANGES:** If it becomes necessary to lockout equipment and the timing involves shift or personnel changes to continue the work, the workers will ensure that the ongoing worker replaces this lockout. This should ensure continuity of the safe lockout of the equipment needing continued work. If no continuity is present, the follow-on shift must re-verify all energy is isolated before performing work.

h. **TRAINING:** Shop foremen will provide training to assure that the purpose and function of the Energy Control Program are understood by employees and that the knowledge and skills required for the safe application, usage, and removal of energy controls are required by employees. Each Authorized Employee shall receive training in the recognition of applicable hazards, energy sources, and the methods and means necessary for energy isolation and control annually. Each Affected Employee shall be instructed in the purpose and use of the ECP.

i. **SAFE ELECTRICAL WORK PRACTICES:** Only qualified persons will be permitted to work on or near exposed energized parts. Qualified persons are those individuals who have been trained and are familiar with the following:

(1) The skills and techniques necessary to distinguish exposed live parts from other parts of electrical equipment.

(2) The skills and techniques necessary to determine nominal voltage of exposed live parts.

(3) Familiar with the clearance distances Table S-5 and corresponding voltages to which the qualified person will be exposed.

**TABLE S-5 - Approach Distances for Qualified Employees - Alternating Current**

<u>Voltage Range (Phase)</u>	<u>Minimum Approach Distance</u>
300V and less	Avoid Contact
Over 300V, not over 750V	1 ft. 0 in. (30.5 cm)
Over 750V, not over 2kV	1 ft. 6 in. (46 cm)
Over 2kV, not over 15kV	2 ft. 0 in. (61 cm)
Over 15kV, not over 37kV	3 ft. 6 in. (91 cm)
Over 37kV, not over 87.5kV	3 ft. 0 in. (107 cm)
Over 87.5kV, not over 121kV	4 ft. 6 in. (137 cm)

Note: Tools and protective gear needed to insulate the qualified person at distances less than minimum approach distances.

j. **ANNUAL INSPECTION:** An annual inspection of the Lockout/Tag-out Energy Control Program will be conducted to ensure that employees are following the written procedures for this

program. The General Maintenance and Operations Foreman perform this inspection with oversight by the Safety Manager.

**4. REFERENCES.**

- a. OSHA 29 CFR, 1910.147
- b. OSHA 29 CFR , 1910.333
- c. MCM-FES-138-06, Utility and/or Service Interruption Procedures.

**5. RESCISSIONS.** Engineering Standard Operating Procedure No. 10, dated March 1, 2010.

**6. RESPONSIBILITY.** The Chief, Facilities Engineering Service, is responsible for the contents of this SOP.

**7. REVIEW DATE.** April 30, 2019.

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WESLEY SARGENT  
Chief, Facilities Engineering

Attachments:

A - [Annual Inspection Certification Form](#)

B - [Lockout/Tagout Program Energy Control Procedure Form](#)

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