

CURRENT Lock-out/Tag-out Procedure

Energy Supply Lock-out/Tag-out Procedure for: CURRENT

Purpose

This procedure establishes the minimum requirements for the lock-out/tag-out of energy isolating devices whenever maintenance, servicing or modification is done on machines or equipment. It shall be used to ensure that the machine or equipment is stopped, isolated from all potentially hazardous energy sources and locked-out or tagged out before employees perform any servicing or maintenance where the unexpected energization or start-up of the machine or equipment or release of stored energy could cause injury.

Definitions

The following definitions apply to this document:

Shall: Use of this term, means that it must be performed. There is not any valid excuse or reason for non-compliance.

Energy: Any type of energy including, electrical, mechanical, kinetic, magnetic, thermal, hydraulic, pneumatic, chemical, solar, wind, etc.

Energy Control Procedure: A written checklist which identifies all energy sources which must be controlled for safe shutdown of the equipment.

Hazardous Energy Source: Any energy source that may harm personnel or property. For electrical sources this is defined to mean sources supplying in excess of: 50V

Energy Isolating Device: Any electrical or mechanical device which prohibits energy discharge at or within the machine being serviced. For electrical circuits this would be a switch, breaker or power plug that is separate from the device being serviced. In mechanical systems, this may take the form of a block which will prohibit movement. For pneumatic and hydraulic systems a cut off valve and bleeder valve which allows depressurization of the system are required.

Wall Safety Switch: These are knife type disconnect switches of various sizes mounted on the walls of the lab for building distribution of high power AC or DC. The voltage and current available through these disconnects is in excess of 208V and/or greater than 40A.

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Compliance with This Procedure

All employees are required to comply with the restrictions and limitations imposed upon them during the use of lock-out or tag-out. Employees performing lock-out or tag-out shall do so in accordance with this procedure. Persons authorized to perform lock-out shall read, sign and comply with this procedure and the Lock-out Key Authorization Form attached. The attached signed form will be kept by the lab manager as a record of which key is currently assigned to which employee. All employees, upon observing a machine or piece of equipment which is locked-out or tagged, shall not attempt to start, energize, or use that machine or equipment. Failure to comply with this procedure will result in disciplinary action which will include temporary loss of all lab privileges until the employee involved has discussed the matter with their advisor. Further disciplinary action may be taken based on the lab manager, advisor and Director's recommendation. This may, in severe cases of negligence on the employee's part, be grounds for possible expulsion from CURRENT.

Sequence of Lock-out/Tag-out

- (1) Notify all affected employees that servicing, maintenance or modifications are required on a machine or equipment and that the machine or equipment must be shut down and locked out to perform that work. Notification must include; the purpose of the work, that other personnel shall not remove or bypass locks/tags/lockout devices and those other personnel shall not attempt to start the machinery or equipment.
- (2) The authorized employee shall identify the type and magnitude of the energy that the machine or equipment utilizes, shall understand the hazards of the energy, and shall know the methods to control the energy. The employee shall generate an Energy Control Procedure (ECP) for all energy sources, type (e.g. hydraulic, pneumatic, kinetic, electrical), or form (e.g. active, stored). For guidance in generating an ECP, please see the lab manager.
- (3) If the machine or equipment is operating, shut it down by the normal stopping procedure (depress the stop button, open switch, close valve, etc.).
- (4) Apply the energy isolating device(s) so that the machine or equipment is isolated from the energy source(s). If an ECP already exists for the equipment, the employee shall use the ECP as the method of controlling the energy.

If the equipment only has electricity supplied by a plug connection, no stored energies, and the plug is maintained under the exclusive control of the employee performing lockout, the service, maintenance or modification

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activities may be conducted after the plug has been disconnected and while those conditions are maintained. If control of the disconnected plug cannot be maintained by the individual performing the work, then further actions must be taken to control the energy while the work is being performed.

Emergency stop buttons are not to be used as the method of isolating the machine or equipment from building power unless there is no other method of removing power from the equipment, i.e. the equipment fails to shut off normally.

- (5) Lock-out the energy isolating device(s) with assigned individual lock(s). If no lock is available or if the energy isolating device is incapable of being locked, a lock-out tag shall be attached in a manner clearly visible to everyone at the point where lock-out has been done.
- (6) A sign (Tag-out) shall be placed at the point of the Lock-out device which clearly states that the machine or equipment has been locked/tagged out and that no attempt to restore power shall take place without the permission of the person identified on the lock out device or tag out tag.
- (7) Stored or residual energy (such as that in capacitors, springs, elevated machine members, rotating flywheels, hydraulic systems, and air, gas, steam, or water pressure, etc.) must be dissipated or restrained by methods such as grounding, repositioning, blocking, bleeding down, etc.
- (8) Ensure that the equipment is disconnected from the energy source(s) by first checking that no personnel are exposed, then verify the isolation of the equipment by operating the push button or other normal operating control(s) or by testing to make certain the equipment will not operate.

Caution: Return operating control(s) to neutral or "off" position after verifying the isolation of the equipment.

- (9) The machine or equipment is now locked-out or tagged out.

Restoring Equipment to Service

When the servicing or maintenance is completed and the machine or equipment is ready to return to normal operating condition, the following steps shall be taken.

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

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- (2) Check the work area to ensure that all tools and test equipment has been safely positioned or removed from the area.
- (3) Check the work area to ensure that all employees have been safely positioned or removed from the area.
- (4) Verify that the controls are in the neutral or off position.
- (5) Remove the energy isolating device(s) or tag(s) and reenergize the machine or equipment. Note: The removal of some forms of blocking may require re-energization of the machine before safe removal.
- (6) Notify affected employees that the servicing or maintenance is completed and the machine or equipment is ready for use.

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Compliance Certification

Compliance with the CURRENT Lock-out/Tag-out Procedure is mandatory for all CURRENT employees. I have read, understand and will comply with all aspects of the forgoing CURRENT Lock-out/Tag-out Procedure.

Printed Name: _____

Signature: _____

Date: _____

Return this signed form to Bob Martin when completed.

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Lock-Out Key Authorization Form

All aspects of the CURRENT Lock-out/Tag-out Procedure shall be complied with as well as the following safety rules.

- All wall safety switches will be maintained in the off position when power is not needed. These switches shall only be turned on when testing is in process and power is required.
- You are the only person assigned the responsibility to use the assigned lock and key.
- You will personally control the lock and key at all times. The key shall not be left unattended or given to any other individual.

By signing this authorization form I agree to ensure that all aspects of the CURRENT Lock-out/ Tag-out Procedure are followed and that all electrical safety issues are considered prior to and after the removal of the lock from the associated wall safety switch. Electrical safety includes but is not limited to the following:

- 1) All power connections are properly tightened.
- 2) All power connections are secured with proper strain relief.
- 3) All electrical connections have been checked and verified that they conform to electrical standards for wire size, color, grounding and neutral vs. hot leads.
- 4) All personnel safety issues with the load have been considered including safety shields or other protective barriers.
- 5) An up-to-date test procedure for experimental circuits has been generated which includes an ECP. This shall be submitted to the lab manager, shall be kept current with the test set up, and shall be used during experimental testing.
- 6) Two people are present in the immediate area in case of an emergency when the power is on.
- 7) All personnel operating the source power are trained in the proper use of the associated equipment and all associated lab safety devices, procedures and practices. This includes the use of the CURRENT Lock-out and Tag-out procedure whenever maintenance, repair or electrical connections are changed that are associated with the load device.
- 8) Never assume the power is off to a device. Always test to be sure the power is off prior to working on the device.
- 9) Never remove a Lock-out/Tag-out lock or tag unless you are sure everyone is clear of any danger.

Printed Name: _____ Date _____

Responsible Person _____ Key Number _____