



6001 University Boulevard
Moon Township, Pennsylvania 15108

Safety Policy Manual - Section 1.0

Policy No. SM 1.7

**THE CONTROL OF HAZARDOUS ENERGY
(LOCKOUT/TAGOUT)**

Department: Safety	Title: The Control of Hazardous Energy (Lockout/Tagout)
Section: 1.0 - Safety Management	Number: SM 1.7

I. PURPOSE:

The purpose of this policy is to establish the minimum requirements for the lockout and/or tagout of energy isolating devices. The procedures shall be followed to ensure that machines or equipment are isolated from all potentially hazardous energy sources, and locked out and/or tagged out before employees perform any servicing or maintenance activities. In addition, it has been designed to meet the requirements of the Occupational Safety & Health Administration Standard 29 CFR 1010.147.

II. SCOPE & APPLICABILITY:

- A. This program applies to all Robert Morris University employees whose assigned work tasks may reasonably require them to work on or around sources of hazardous energy. The standard does not apply to the following:
 - 1. Work on cord and plug connected electrical equipment if the hazard is controlled by unplugging the equipment from the energy source and the plug is under the exclusive control of the employee performing the servicing and/or maintenance; and
 - 2. Hot tap operations of utilities when the continuity of service is essential.

III. REFERENCES:

- A. 29 CFR Occupational Safety and Health Administration (OSHA), 1910.147
- B. Accident Prevention Manual for Industrial Operations, Engineering and Technology, Tenth Edition, 1992.

IV. DEFINITIONS:

- A. **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 and/or tagout, or whose job requires him/her to work in an area in which such servicing or maintenance is being performed.
- B. **AUTHORIZED EMPLOYEE** – A person who locks or implements a tagout 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 performing maintenance or service on a machine or equipment that must be locked or a tagout system implemented.
- C. **CAPABLE OF BEING LOCKED OUT** – An energy isolated device is capable of being locked out if it has a hasp or other means of attachment to which, or through which, a lock can be affixed, or it has a locking mechanism built into it. Other energy isolating devices are 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.
- D. **DEENERGIZATION** – The removal of voltage and all other energy sources from machinery and equipment.
- E. **ENERGIZED** – Connected to an energy source or containing residual or stored energy.

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- F. 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 line valve; a block; and any similar device used to block or isolate energy. Push buttons, selector switches, and other control circuit type devices are not energy isolating devices.
- G. HAZARDOUS ENERGY SOURCES – Any source of electrical, mechanical (potential and kinetic), hydraulic, pneumatic, chemical, thermal, or other energy.
- H. HOT TAP – A procedure used in the repair, maintenance and service 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 system.
- I. LOCKOUT - The placement of a lockout device on an energy isolating device, in accordance with an established procedure, ensuring that the energy isolating device and the equipment being controlled cannot be operated until the lockout device is removed.
- J. LOCKOUT DEVICE - A device that utilizes a positive means such as a lock, either key or combination type, to hold an energy-isolating device in the safe position and prevent the energizing of a machine or equipment. Included are the blank flanges and bolted slip blinds.
- K. NORMAL OPERATIONS – The utilization of a machine or equipment to perform its intended function.
- L. SERVICING AND/OR MAINTENANCE – Workplace activities such as constructing, installing, setting up, adjusting, inspecting, modifying, and maintaining and/or servicing machines or equipment. These activities include lubrication, cleaning and unjamming of machines or equipment and making adjustments or tool changes, where the employee may be exposed to the unexpected energization or startup of the equipment or release of hazardous energy.
- M. SETTING UP – Any work performed to prepare a machine or equipment to perform its normal operations.
- N. STORED ENERGY – Any energy trapped in a system away from an energy-isolating device, or any potential energy present in a system.
- O. TAGOUT – The placement of a tagout device on an 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 tagout device is removed.
- P. TAGOUT DEVICE – A prominent warning device, such as a tag and a means of attachment, which can be securely fastened to an 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 tagout device is removed.

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V. PROCEDURE:

A. GENERAL REQUIREMENTS

1. All new machines or equipment purchased and installed shall be designed to accept a lockout device. In addition, whenever renovation, major repair, or modification of a machine or equipment is performed, energy-isolating devices shall be designed to accept a lockout device.

B. LOCATION AND ASSIGNMENT OF LOCKOUT/TAGOUT DEVICES AND ACCESSORIES

1. Locks will be individually keyed and issued to authorized employees by Department Manager/Supervisor during the initial training session.
2. Other lockout/tagout devices and accessories for use by authorized employees such as tags, hasps, and other miscellaneous equipment specific lockout devices will be located in the following areas
 - a) Moon Campus – Maintenance Shop
 - b) Island Sports Center – Maintenance Shop

C. APPLICATION OF TAGS ONLY

1. Tags are authorized for use without locks only where locks cannot be applied to an energy-isolating device because of design limitations. However, where tags only are used at a minimum one additional safety measure must be implemented. These safety measures include but are not limited to the following:
 - a) Removal of a fuse for a circuit;
 - b) Removal of a drawout circuit from a switchboard;
 - c) The placement of a blocking mechanism over the operating handle of a disconnecting means;
 - d) The opening of a switch for a control circuit that operates a disconnect and disables the system;
 - e) The opening of switch or disconnecting means which opens the circuit between the source of power and the exposed circuits and parts; or
 - f) Grounding the circuit where the work is to be done.

D. OUTSIDE CONTRACTOR'S/SERVICE PROVIDER'S LOCKOUT/TAGOUT PROGRAM

1. Whenever outside contractor or service provider's are performing activities covered by this standard, the outside contractor shall upon request, provide a copy of their "Control of Hazardous Energy (Lockout/Tagout) Program" to the RMU Department Manager/Supervisor who is responsible for supervising the contractor's work activity at the University.

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2. The RMU Department Manager/Supervisor responsible for supervising the contractor's work activity shall review, accept, and brief affected RMU employees on the contents of the contractor's written lockout/tagout program prior to the contractor starting work at RMU. In addition, the responsible RMU Department Manager/Supervisor shall provide a copy of RMU's Lockout/Tagout Policy to the outside contractor/service provider to ensure the contractor is familiar with and acknowledges RMU originated lockout/tagout operations.

E. SHIFT/CREW CHANGE

1. To ensure the continuity of lockout/tagout protection is maintained during shift or crew changes, an employee replacing a worker who had a piece of equipment or machinery locked/tagged out of service shall install his/her lock and tag prior to, or concurrent with, the individual who is removing his/her lock and tag from the previous shift.

F. LOCKOUT/TAGOUT INVOLVING MORE THAN ONE INDIVIDUAL

1. In the preceding steps, if more than one individual is required to lockout and/or tagout equipment, each individual shall place his/her own personal lockout device or tagout device on the energy isolating device(s). When an energy-isolating device cannot accept multiple locks or tags, a multiple lockout or tagout device (hasp) may be used. If lockout is used, a single lock may be used to lockout the machine or equipment, however the key to this lock shall be secured in a box or a cabinet which is designed to accept multiple locks to secure it. Each employee will then use his/her own lock to secure the box or cabinet that contains the key for the lock that is actually affixed to the energy isolating device. As each person no longer needs to maintain his or her lockout protection, that person will remove his/her lock from the box or cabinet.

G. EQUIPMENT/MACHINE SPECIFIC LOCKOUT/TAGOUT PROCEDURES

1. Individual equipment/machine specific procedures shall be developed for each piece of equipment or machine where all of the following elements do not exist:
 - a) The machine or equipment has no potential of stored or residual energy or reaccumulation of stored energy after shutdown which could endanger employees;
 - b) The machine or equipment has a single energy source which can be readily identified and isolated;
 - c) The isolation and locking out of that energy source will completely deenergize and deactivate the machine or equipment;
 - d) The machine or equipment is isolated from that energy source and locked out during servicing or maintenance;
 - e) A single lockout device will achieve a locked-out condition;
 - f) The lockout device is under the exclusive control of the authorized employee performing the servicing or maintenance;
 - g) The servicing or maintenance does not create hazards for other employees; and
 - h) The employer, in utilizing this exception, has no accidents involving the unexpected activation or reenergization of the machine or equipment during servicing or maintenance.

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2. Prior to conducting servicing or maintenance on a piece of machinery or equipment that does not satisfy all eight of the required elements listed in step V.G.1 of this written policy, a specific procedure shall be developed and authorized by the Department Manager/Supervisor responsible for the employees who will be performing the servicing and/or maintenance activity. The procedure shall be documented on the Equipment Specific Lockout/Tagout Procedure Form which is included in **Attachment C** of this written policy.
3. After completing an individual equipment specific procedure form for a particular piece of machinery proceed to step V.H.3 below to initiate the actual lockout/tagout activity.
4. Once equipment/machine specific procedures are developed, the Department Manager/Supervisor responsible for those employees performing servicing and maintenance operations shall maintain a departmental binder of these procedures for future utilization by authorized employees.

H. SEQUENCE OF LOCKOUT/TAGOUT PROCESS

1. Review the departmental binder containing individual equipment specific lockout/tagout procedure forms. If one is available for the piece of equipment or machinery that is requiring the serving or maintenance, make a copy and proceed to step V.H.3.
2. If an equipment specific procedure has not been developed for the equipment that is requiring servicing or maintenance, review Section V.G.1. above to determine if this written policy requires that an individual equipment specific procedure be developed, initiate the actions contained in Section V.G.2. If it has been determined that an equipment specific procedure is not required proceed to the next step, V.H.3.
3. Notify all affected employees that a lockout or tagout system is going to be utilized and the reason therefore. The authorized employee shall know the type and magnitude of energy that the machine or equipment utilizes and shall understand the hazards thereof.
4. If the machine or equipment is operating, shut it down by the normal stopping procedure (depress stop button, open toggle switch, etc.).
5. Operate the switch, valve, or other energy isolating device(s) so that the equipment is isolated from its energy source(s). Stored energy (such as that in 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 repositioning, blocking, bleeding down, etc.
6. Lockout and/or tagout the energy isolating devices with assigned individual lock(s) and/or tag(s). **As a minimum, a tag device will be used for all required LOTO procedures.**
7. After ensuring that no personnel are exposed, and as a check on having disconnected the energy sources, operate the push button or other normal operating controls to make sure the equipment will not operate.

Caution: Return operating control(s) to “neutral” or “off” position after the test.

8. The equipment is now locked out and/or tagged out.

Note: Reference Attachment B, Lockout/Tagout Functional Flow Diagram, for a graphic illustration of this process.

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I. TESTING OR POSITIONING OF MACHINES/EQUIPMENT, OR COMPONENTS

1. In some cases it may be necessary for authorized employees to briefly remove their lockout/tagout devices for testing or positioning machines, equipment or components thereof. Before removing the lockout/tagout devices, the authorized employee clears the machine/equipment and removes potentially exposed employees.
2. Once the machine/equipment is clear, remove the lockout/tagout devices just long enough to perform the controlled testing or positioning. Ensure that employees are not and will not be exposed to injury.
3. Energize the machine/equipment and proceed with the testing/positioning.
4. Immediately following the testing/positioning de-energize the machine/equipment and reapply the lockout/tagout devices in accordance with Section V.H. of this program.

J. RESTORING MACHINES OR EQUIPMENT TO NORMAL OPERATIONS

1. After the servicing and/or maintenance is complete and equipment is ready for normal operations, check the area around the machines or equipment to ensure that no one is exposed.
2. After all tools have been removed from the machine or equipment, guards have been reinstalled and employees are in the clear, remove all lockout and/or tagout devices and operate the energy isolating devices to restore energy to the machine or equipment.

Note – Lockout/Tagout Devices shall only be removed by the employee who actually applied the device. If for some reason the employee who applied the device is not available to remove it follow the requirements contained below in Section V.K.

K. REMOVAL OF LOCKOUT/TAGOUT DEVICE BY THE EMPLOYER WHEN THE AUTHORIZED EMPLOYEE WHO APPLIED THE DEVICE IS NOT AVAILABLE

1. The Department Manager/Supervisor of the authorized employee who originally installed the lockout/tagout device has the authority to remove the device or direct an authorized subordinate to remove the device provided that the following items have been addressed:
 - a) The Department Manager/Supervisor shall verify that every attempt has been made to locate the authorized employee who originally installed the device and they are not in the facility. A record of a notification attempt must be maintained by the Manager/Supervisor.
 - b) The Department Manager/Supervisor shall verify that every attempt has been made to contact to the authorized employee and advise them that their lockout/tagout device has been removed.
 - c) In cases where attempts to contact they subject empolyee were unsuccessful the Department Manager/Supervisor shall ensure that the employee is notified prior to resuming work at Robert Morris University.

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L. PERIODIC LOCKOUT/TAGOUT PROGRAM INSPECTIONS

1. Periodic inspections of the lockout/tagout program will be performed by the Department Manager/Supervisor of departments who have authorized employees who utilize this lockout tagout program.
2. These periodic inspections shall be conducted at least annually and included a review between the inspector and each authorized and affected employee. The review shall evaluate employee responsibilities under the energy control procedure being inspected as well as the elements addressed in the training.
3. A formal report shall be prepared and certified by the authorized Department Manager/Supervisor who conducted the inspection. The report shall include but not be limited to the identification of machines or equipment on which the energy control procedure was being utilized during the time of the inspection; the date of the inspection; the employees included in the inspection; the person performing the inspections; and any noted deficiencies; and a subsequent plan for improvement.
4. A copy of the periodic inspection report shall be forwarded to the RMU Safety Officer.

VI. RESPONSIBILITIES:

A. DEPARTMENT MANAGER/SUPERVISOR:

1. Designate authorized employees and assign individually keyed locks to them (re. **Attachment A**, Lockout/Tagout Authorized Employee Lock Issue Log).
2. Ensure that employees receive initial training and refresher training thereafter. The training must cover the contents of this written hazardous energy control program.
3. Ensure that all new machines and equipment purchased are designed to accept a lockout device.
4. Conduct periodic program inspections in accordance with Section V.L. of this written program.

B. EMPLOYEES:

1. Attend initial lockout/tagout training and refresher training as appropriate.
2. Implement all applicable safe work practices identified in this written program before performing any maintenance or servicing activities where the unexpected energization, start-up or release of stored energy could cause injury.
3. Notify your Department Manager/Supervisor if any deviations from this process are encountered or observed.

C. SAFETY SERVICES:

1. Assist in the development of course curriculum and/or assist with educational sessions in departments where there are authorized and/or affected employees.
2. Review the periodic inspection reports submitted by Department Manager/Supervisor and conduct an audit of the LO/TO program annually.

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VII. TRAINING & EDUCATION:

- A. All authorized as well as affected RMU personnel shall receive training upon initial hire. Retraining is provided when there are changes in the job assignment, equipment, process, or new hazard is introduced or as deemed necessary. The training shall include but not be limited to instruction concerning the scope, purpose, authorization, rules, and techniques designated in this policy.
- B. All authorized as well as affected RMU personnel shall read and become familiar with the requirements contained in this policy.

VIII. DOCUMENTATION & RECORD KEEPING:

- A. Authorized employees shall sign a log to acknowledge that they have received the initial training and have been assigned to individually keyed lock with a unique identifying number. The respective Department Manager/Supervisor who has designated authorized employees for their department shall maintain these logs for a period of 5 years.
- B. Training records shall be maintained by the department for a period of five years.
- C. Copies of the periodic inspection reports, conducted by Department Manager/Supervisors, as well as the audit reports prepared by Safety Services shall be maintained by Safety Services for a period of five years.

IX. REVIEW FREQUENCY/INTERPRETATION & CHANGES:

- A. This policy will be reviewed on an annual basis by the Safety Management Subcommittee.
- B. All requests for interpretations of and changes to this policy shall be directed to the Safety Department.

X. SIGNATURES:

William J. Katip, Ph.D.
Senior Vice President for Academic & Student Affairs

Dan W. Kiener
Senior Vice President for Business Affairs

Implementation Date: March, 2006

Last Reviewed/Revised: _____

ATTACHMENTS: A - Lockout/Tagout Authorized Employee Lock Issue Log
B - Lockout/Tagout Functional Flow Diagram
C - Equipment/Machine Specific Lockout/Tagout Procedure Form

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ATTACHMENT A

LOCKOUT/TAGOUT AUTHORIZED EMPLOYEE LOCK ISSUE LOG



Robert Morris University
Lockout/Tagout Authorized Employee Lock Issue Log

Employee's Name (Print or Type)	Employee's Signature	Employee's Job Title	Serial No. Of Lock Issued	Date

Responsible Department Head Signature

Date

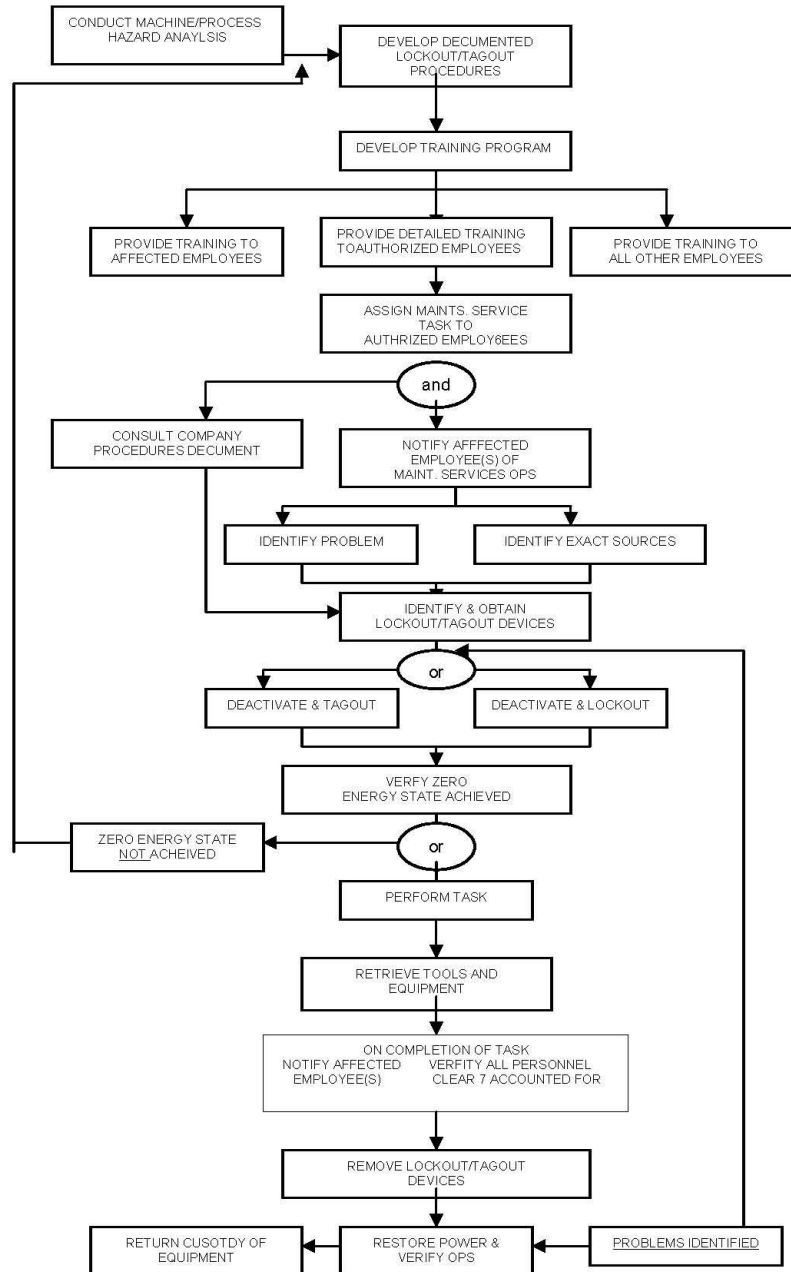
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ATTACHMENT B

LOCKOUT/TAGOUT FUNCTIONAL FLOW DIAGRAM

LOCKOUT/TAGOUT FUNCTIONAL FLOW DIAGRAM



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ATTACHMENT C

**EQUIPMENT/MACHINE SPECIFIC
LOCKOUT/TAGOUT PROCEDURE FORM**

Equipment/Machine Specific Lockout/Tagout Procedure Form

Equipment/Machine No.: _____ Description: _____

CAUTION: Servicing or maintenance is not permitted unless the equipment is isolated from all hazardous energy sources. This is the exclusive responsibility of designated “Authorized Employees” (see below) who must follow the complete Robert Morris University - Control of Hazardous Energy (Lockout/Tagout) Program.
This sheet is limited and abbreviated: It must not be considered a substitute for the complete program.

Hazardous Energy Source	Energy Isolating Devices			Lockout And/Or Tagout Control Devices (Check)			
Type	Type	Location	ID No.	Lock	Tag	Both	Other*
1.							
2.							
3.							
4.							
5.							
6.							

*ADDITIONAL SAFETY MEASURES:	

NOTE: Ensure that all stored energy sources have been identified as well as the method to be utilized to dissipate or restrain the stored energy.

AUTHORIZED EMPLOYEES:	
Only the following are authorized to undertake the lockout/Tagout Procedure on this equipment:	

(Procedure Prepared By)

(Date)

(Department Head Approval)

(Date)