

MAPP CONSTRUCTION

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LOCKOUT TAGOUT

Author: A Holland

MAPP Construction - Corporate
344 Third Street
Baton Rouge, LA 70801
(225) 757-0111

MAPP Construction – New Orleans
601 Poydras St., Suite 1715
New Orleans, LA 70130
(504) 833-6277

MAPP Construction - Houston
1511 Katy Freeway, Suite 145
Houston, TX 77079
(281) 582-3696

MAPP Construction - Dallas
3131 Turtle Creek Blvd, Suite 1300
Dallas, TX 75219
(214) 267-0700

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MAPP employees do not perform work on energized electrical systems, and any subcontractor performing this type of work shall be required to submit for approval a Lockout/ Tagout Program meeting or exceeding regulatory guidelines. If a client has a Lockout/Tagout Program - MAPP and all subcontractors shall follow that policy. In the absence of any subcontractor or client policies, all workers shall comply with the follow policy.

1. PURPOSE AND SCOPE

1.1. The purpose of this policy is to establish minimum procedures to ensure the safety and health of personnel who may work on any type of equipment capable of being energized or storing energy. This policy applies to all employees and subcontractors, who may be required to work on this type of equipment or otherwise be exposed to the unexpected energization of this equipment.

2. RESPONSIBILITIES

2.1. MAPP Superintendent - The MAPP superintendent shall verify that all requirements specified in this work instruction have been met prior to authorizing a supervisor to remove an authorized person’s lockout device. The MAPP Superintendent shall assure that annual and post-incident reviews, as defined below, have been performed. The MAPP Superintendent shall maintain a spare or multiple spare keys for locks used in the lockout program in a safe, secure manner.

2.2. Work Supervisor -It is the responsibility of each person, who supervises employees that perform work covered by this procedure, to:

- Train employees in the recognition of hazardous energy sources and the method and means of isolating such sources.
- Monitor the work to verify compliance with this procedure.
- Ensure that adequate supplies of energy isolating devices and lockout devices, i.e., locks, tags, etc., are readily available.
- Confirm that each job is properly prepared by Operations and/or client personnel prior to implementing lockout and tagout procedures.
- Determine the best lockout method (individual or group) for each lockout and tagout operation.
- Supervise all group lockout activities.

3. DEFINITIONS

Affected Employee	A person whose job requires him/her to operate or use machines, equipment, or process on which service is being performed under the lockout and tagout program, or whose job requires him/her to work in an area where such service is performed
Authorized Employee	A person who is authorized to lock out and tag out machines, equipment, or process in order to perform service or maintenance work on that machine, equipment, or process.
Electrical Plug and Connector Lockout Box	A box specifically designed to lock out electrical plug assemblies or, in the case of engine driven equipment, its battery cables
Energy Sources	Electrical, mechanical, hydraulic, pneumatic, chemical, thermal, or other source.
Energy Isolation Device	A mechanical device that provides a positive means of control to prevent the transmission or release of energy. Examples of these devices include circuit breakers, disconnects, pins, blinds, blanks, valves, blocks, and double block and bleed. They do not include secondary controls such as start buttons or controls that regulate valves.

Group Lockbox	A box or similar device provided for the placement and safekeeping of keys used to secure energy isolation devices in a group lockout. Group lockboxes are generally clearly labeled as to their purpose, are tamper proof and are capable of being locked by one lockout lock or a multiple gang attachment.
Group Lockout	A procedure which provides a level of protection equivalent to that provided by a personal lockout or tagout device, when servicing and/or maintenance is performed by a crew, department, or other group.
Lockout	The placement of a lockout device—usually a lock—on an energy isolation device to ensure that the energy isolating device and the equipment being controlled may not be operated until the lockout device is removed.
Lockout Device	A device used to secure an energy isolation device in a particular position (valve handle covers, switch covers, or circuit breaker devices) in such a way that the position of the energy isolation device cannot be changed without the removal of the lock out device.
Point(s) of Protection	Point or place where a lockout device has been placed on an energy isolation device to protect employees from the hazardous release of energy.
Specific Energy Control Procedure	A written procedure that details specific actions to be taken to control hazardous energy during servicing or maintenance. A specific lockout written procedure, a job safety analysis specific to the machine, equipment, or process being worked on are examples of acceptable specific energy control procedures.
Tagout	The placement of a tagout device—usually a tag—on an energy isolation device to indicate that the energy isolating device and the equipment being controlled may not be operated until the tagout device is removed.
Verification	Verification (try-out) of machines, equipment, or processes to assure that energy sources have been isolated

4. PROCEDURE Specific Energy Control Plans

4.1. Specific Energy Control Plans must be developed in writing for each operation covered under the purpose and scope of this policy. These specific Energy Control Plans must contain the following steps: **Step 1** — Preparing To Shut Down The Machine, Equipment, Or Process
Examples of Step 1 issues to be addressed follow.

- Identify all sources of energy and potential for stored and residual energy.
- Identify methods that will be used to isolate and lockout these energy sources.
- How will Operations or the client prepare the machine or equipment for shutdown and servicing? Do process pumps, or other equipment need to be drained and flushed to eliminate a chemical exposure?
- How will the affected persons be notified of the impending shut down of the machine, equipment, or process?
- How will the machine, equipment, or process be shut down?
- How will stored and/or residual energy be relieved, cooled, blocked, or isolated?
- How will all sources of energy to the machine, equipment, or process be isolated, locked, and tagged out?
- Identify the proper type and placement for locks, tags, and lockout devices at all points of protection where an energy isolation device is used.
- Determine if and where temporary blocking or supports will be needed and how to lock them in place.
- Will the individual or group lockout method be used for the lockout and/or tagout?

All of this information shall be placed in a written procedure specific to the operation, and this information will be conveyed to the personnel who will perform the servicing and/or maintenance of the equipment.

Step 2 — Shutting Down The Machine and/or Equipment

Examples of issues to be addressed and actions to be taken include the following.

- Prior to shutting down the equipment, verify that the client is aware of and approves of the deactivation of the machine, equipment, or process. Obtain permits.
- Notify all affected persons that the machine, equipment, or process will be shut down and shall not be reactivated until further notice.
- Shut down the machine, equipment, or process in accordance with the written plan.

Step 3 — Isolating The Machine, Equipment, Or Process From The Energy Sources

Examples of issues to be addressed and actions to be taken in this phase are the isolation of all electrical, mechanical, pneumatic, chemical, thermal, or other energy sources by the application of appropriate energy isolation devices, lockout devices, locks, and tags.

Step 4 — Applying The Lockout And Tagout Devices

Examples of issues to be addressed and actions to be taken in this phase follow.

- If using the individual lockout method, verify that all authorized persons place a lock and tag on each energy source.
- If using the group lockout method, the supervisor must place a lock and tag on each energy source, verify that the key for each lock is placed in the group lock box, and that the group lock box is secured by placing their lock and tag on the lock box. Then each individual involved with the locked out equipment shall apply a lock on the group lock box, including subcontractors

Step 5 — Safely Releasing All Potentially Hazardous Stored Or Residual Energy

Examples of issues to be addressed and actions to be taken in this phase are:

- Placing temporary energy isolating devices or supports, as needed. The energy isolating devices shall be locked in place and clearly identify as to their purpose.
- Safely releasing any stored or residual electrical energy by a qualified electrician.
- Safely releasing any stored or residual hydraulic or pneumatic energy by removing and/or bleeding lines and equipment or utilizing another, equivalent safe method.
- Safely releasing any stored or residual thermal or chemical energy by draining and flushing lines, pumps, or other equipment that may contain chemicals, steam, hot water, etc.
- Safely releasing any mechanical energy by allowing the equipment to cycle, or other safe means.

Step 6 — Verifying (Trying Out) The Isolation Of The Machine, Equipment, or Process

Before starting the maintenance or servicing of the machine, equipment, or process, proper isolation must be verified.

Examples of issues to be addressed and actions to be taken in this phase follow.

- A qualified electrician shall test all electrical conductors with an approved meter. The meter shall be tested on a known source, the locked out equipment is then tested, and afterwards the meter is tested on the known source again.
- Attempt to restart the equipment by pushing the start button, manual controls, etc., to verify that the machine, equipment, or process cannot be inadvertently started during servicing.
- If the machine, equipment, process, or a component thereof does start during the verification phase, stop the process and notify the supervisor. Additional steps shall be taken to identify, isolate, lockout, and tagout the energy source. If necessary, the Specific Energy Control Procedure shall be revised before work resumption.

5. ENERGY ISOLATION

5.1. General Requirements

- No attempt shall be made to operate equipment on which a lockout device has been placed.
- No one shall remove another person's lockout device, except as described below.
- All locks shall have identification as to the owner of the device.
- Lockout devices must be inspected before each use to ensure they are working properly.
- Locks for energy source isolation must have a means of identification that

distinguishes them from any other locking device on the project. A particular color, shape, or size may be used as the means of identification. Locks should also be numbered.

- Lockout devices shall not be used for any other purpose other than to lockout equipment.
- When a machine, equipment, or process must be isolated and locked out for a long period of time, periodic inspections should be performed to verify that locks and tags are still in place. The frequency of these inspections will vary depending upon the circumstances, e.g., inspect prior to each shift for an active operation or weekly for an inactive operation.

5.2. Locks

- Locks used for isolating an energy source, shall not be used for any other purpose.
- Locks used as part of an energy isolation device must be individually keyed. While in use, the key shall remain in the possession of the individual who placed the lock(s) or in the group lock box.
- Spare keys for locks must be placed in a lock box in the possession of the Superintendent.
- A Lockout Log should be used to identify the location of locks while in use.
- Locks must be durable and able to withstand the environment to which they are exposed.

5.3. Tags

- Tags used in conjunction with lockout devices for the purpose of isolating an energy source shall be standardized in such a way as to serve as a prominent warning, e.g., DANGER — DO NOT OPERATE.
- The tag must have spaces available for date, identification of energy source, and name of the individual placing the tag.
- The construction, markings, and written information on the tag shall be such that deterioration will not occur when exposed to weather and/or corrosive environments.
- Tags and tag attachment devices should not be re-used and are to be appropriately disposed after removal.
- The means of attachment shall be:
 - Of a non-reusable type,
 - Attachable by hand,
 - Self-locking and non-releasable with a strength to withstand at least 50 pounds of pull, and
 - Resistant to weather and corrosive environments.

5.4. Removal of Locks and Tags

- Only the person who applied the lock and/or tag shall remove that lock and/or tag except as provided in this section.
- In cases where the person who applied the lock and/or tag is not available to remove it, the Site Manager may authorize the supervisor to remove the lock and/or tag only in accordance with the following procedure. This procedure should be used only as a last resort to remove a lockout
 1. Verification that the person who applied the lock and/or tag is not present at the facility.
 2. Make all reasonable efforts to contact the person, who applied the lock and/or tag to inform him/her that the lock and/or tag will be removed.
 3. The supervisor must verify that the equipment that was locked out is safe to return to service. All personnel involved in the lock out are clear and no damage will occur when the equipment is restarted.
 4. The supervisor must document how all previous steps have been met. Documentation should be kept on file at the site. Once this has been done, the lock may be removed, but step five shall also be completed.
 5. Ensure that the person who applied the lock and/or tag is notified of the removal before he/she resumes work at the facility.

5.5. Tasks Involving Multiple Shifts

- For tasks requiring lockout and/or tagout, which involve multiple shifts, the supervisor must ensure the continuity of the lockout and/or tagout as follows:
 - The off going supervisor will remove his/her lock and tag only after the incoming supervisor has placed his lock and tag on the lock box.
 - The incoming supervisor will ensure that the incoming craft workers verify isolation and place their locks and tags on the lock box.

5.6. Energy Isolation Methods

There are three methods of energy isolation: individual lockout, group lockout, and tagout only. The method to be used in each situation will depend on .

- The complexity of the system,
- The number of persons who will place locks,
- The number of locks to be placed to effectively lock out the machine, equipment, or process, and
- Whether or not the system is designed to accept a lock.

The supervisor shall determine which method is appropriate for each situation and will identify the method in Step 1 of the Specific Energy Control Procedures.

5.6.1 Individual Lockout Method

- The individual lockout method is normally used when the number of persons and locks that will be required on energy isolation devices is small
- When using the individual lockout method, each person involved in the service or repair of the machine, equipment, or process shall:
 - Place a lock on each appropriate energy isolation device.
 - Place a completed tag on each lock.
 - Remove his/her lockout devices and tags after verification that all of his/her
 - Work is completed,
 - Tools and materials are cleared, and
 - Blocks or temporary energy isolation devices have been removed.

5.6.2 Group Lockout Method

- The group lockout method is normally used when a larger number of persons or locks will be required to assure isolation of energy sources.
- When using the group lockout method, the following procedure shall be used.
 - The supervisor of the authorized employees shall place a single lockout device on each energy isolation device.
 - The supervisor of the authorized employees places a single completed tag on each lockout device.
 - The supervisor places the keys for the single lockout device in the group lockbox or equivalent device.
 - Each authorized employee and the supervisor shall affix a lock and tag to the group lockout device, group lockbox, or equivalent device before he/she begins work, and shall remove those devices only when he/she completes work on the machine, equipment, or process being serviced or maintained.
 - The supervisor shall ensure that all work of personnel under their supervision is completed, and that their personnel will no longer be affected by the lockout prior to removal of lockout devices and tags.
 - The supervisor shall remove his/her lockout devices and tags after verification that all
 - Work is completed,
 - Tools and materials are cleared, and
 - Blocks or temporary energy isolation devices have been removed.

5.6.3 Tagout Only

- The tagout-only method shall be used only when energy sources are not capable of being locked out. This should be very rare considering the variety of lock out devices available on the market.
- Use of the tagout-only method requires approval of the Site Manager.
- All other requirements of this work instruction apply.
- When tagout systems are used, employees shall also be trained in the following limitations of tags:

- Tags are essentially warning devices affixed to energy isolating devices, and do not provide the physical restraint on those devices that is provided by a lock and lockout device.
- When a tag is attached to an energy isolating means, it is not to be removed without authorization of the authorized person responsible for it, and it is never to be bypassed, ignored, or otherwise defeated
- Tags must be legible and understandable by all authorized employees, affected employees, and all other employees whose work operations are or may be in the area, in order to be effective.
- Tags and their means of attachment must be made of materials, which will withstand the environmental conditions encountered in the workplace.
- Tags may evoke a false sense of security, and their meaning needs to be understood as part of the overall energy control program.
- Tags must be securely attached to energy isolating devices so that they cannot be inadvertently or accidentally detached during use.

5.7 • Start-up Procedures

5.7.1 Before lockout and energy isolation devices are removed and energy is restored to the machine, equipment, or process, the following steps shall be taken in order:

- **Step 1**
 - Verify that machine and equipment components, guards, etc., have been replaced and are intact.
 - Also, verify that all tools and materials such as screws, wrenches, nuts, bolts, rags, etc., have been removed from the machine, equipment, or process.
- **Step 2**
 - Verify that the person who applied the devices removes all energy isolation and lockout devices.
- **Step 3**
 - Verify that all personnel are removed from the machine, equipment, or process and are safely positioned so that start-up will not expose them to hazardous energy sources.
- **Step 4**
 - Remove temporary blocking and structural supports as set forth in the Specific Energy Control Procedure

5.8 Shop Equipment

5.8.1 Specific procedures will be required for each piece of shop equipment unless all of the following exceptions are met:

- The equipment must not produce or use any stored energy, for example a portable air compressor, a steam washer, or a chemical pump.
- The equipment can be and is unplugged and the plug remains under the exclusive control of the operator or it is placed in a lockout device and locked.
- The service on the tool is limited to changing bits, blades, or other such devices. The tool must be properly locked out if any

5.8.2 Operators of shop equipment must de-energize and lock out their equipment to change tools, chucks, blades, and perform similar tasks. A power disconnect switch must be provided for this purpose at or near the equipment unless the equipment can be unplugged

- The activation of push-button or butterfly controls will not be solely relied upon for lockout.

6 LOCKOUT AND TAGOUT PROGRAM REVIEW

6.6 Inspections shall be conducted to verify that the site's lockout and tagout program is effective.

6.7 A written review of lockout and tagout procedures shall be performed at least annually and/or after any incident involving lockout or tagout, in order to verify that the requirements of the procedure are being followed.

6.8 A designated employee, other than the one(s) utilizing the lockout and tagout procedure, shall

perform the review.

6.9 The program review shall include an evaluation of employees' compliance with the lockout and tagout procedure.

6.10 The program review shall document the machine, equipment, or process on which the energy control procedure was being utilized, the date of the review, the employees included in the review, and the name of person performing the review. See Figure 1, Lockout and Tagout Program Review Report.

6.11 Safety Evaluation Reports and other written safety audits that include lockout and tagout program review may, in some cases, fulfill the program review requirements.

6.12 The Site Manager shall assure that annual and post-incident reviews have been performed.

7 TRAINING

7.6 Authorized and affected personnel must receive training in the contents of this work instruction and the relevant HSE training module prior to work involving lockout and tagout. No MAPP employee shall perform work on energized electrical systems.

7.7 The training shall be conducted at least annually thereafter, anytime this work instruction is revised, and when a change in machinery, equipment, or process presents new potential hazards.

7.8 Training documentation will be maintained at the site and shall include copies of quizzes and the training record sheet