

LOCK OUT/ TAG OUT PROGRAM

OCT 2021



USC University of
Southern California

Office of
Environmental
Health and Safety

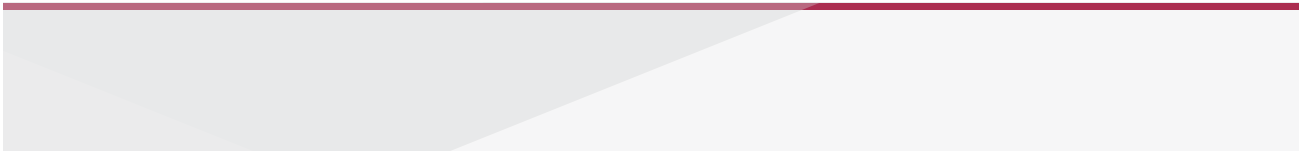


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1.0 Purpose and Scope

The University of Southern California Lockout/Tagout Program is designed to protect university employees, students, contractors, visitors and all affected persons from injury due to an unexpected start-up of machinery or equipment. The Lockout/Tagout system prohibits re-energizing equipment while it is being serviced.

Lockout/Tagout is the first step before initiating equipment maintenance and servicing operations (including university vehicles). Supervisors must instruct/train all affected parties on Lockout/Tagout procedures as well as maintain communication during operation.

Exceptions

- Minor tool changes, adjustments, or other minor activities that do not include maintaining or servicing equipment, which take place during normal, routine, or repetitive operation are not covered by the requirements under Cal/OSHA title 8 section 3314.
- Personnel working under an approved Hot Work Permit (including arc welding and hot tap work) and an approved Hot Work Plan. Specialized tools and equipment for protection shall be used specifically for these processes.
- When the equipment is unplugged from an energy source and receptacle connection is in complete control of the qualified person working on the equipment, i.e., power cord rolled up and away from the outlet.

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2.0 Regulations



State

Cal/OSHA

Title 8: Section 3314	The Control of Hazardous Energy
Section 6004	Accident Prevention Tags
Section 2320.4	De-Energized Equipment or Systems
Section 2320.5	Energized (or Re-Energized) Equipment or Systems
Section 2320.6	Accident Prevention Tags
Section 2530.43	Automatic Restarting
Section 2530.86	Motor Not in Sight from Controller
Sections 2940 - 2945	High Voltage Electrical Safety Orders

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3.0 Definitions

AFFECTED EMPLOYEE	Employee(s) whose job requires them to operate or use equipment on which cleaning, repairing, servicing, setting-up or adjusting operations are being performed under Lockout/Tagout, or whose job requires the employee to work in an area in which such activities are being performed under Lockout/Tagout. Personnel include employees and contractors.
AUTHORIZED EMPLOYEE	A qualified person who locks out specific equipment in order to perform cleaning, repairing, servicing, setting-up, and adjusting operations on that machine or equipment.
BLEED	To release or dissipate residual energy in a machine or equipment so that its state is zero energy.
BLIND	A form of blocking in piping to prevent air, steam, or hazardous substance flow.
BLOCKOUT	The practice of blocking movable parts of a machine (or equipment) with safety devices to prevent them from moving accidentally by gravity or residual energy in a machine.
CAPABLE OF BEING LOCKED OUT	<p>An energy-isolating device is considered capable of being locked out if it:</p> <ul style="list-style-type: none">• Is designed with a hasp or other means of attachment to which a lock can be affixed.• Has a locking mechanism built into it.• Can be locked without dismantling, rebuilding, or replacing the energy-isolating device or permanently altering its energy control capability.
DE-ENERGIZED	Zero energy state of machine or equipment.
ENERGIZED	Machines and equipment are energized when they are connected to an energy source (or sources) or they contain residual or stored energy.

ENERGY-ISOLATING DEVICE	<p>A mechanical device that physically prevents the transmission or release of energy, including but not limited to the following:</p> <ul style="list-style-type: none"> • Manually-operated electrical circuit breaker • Disconnect switch • 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 • Line valve • Block • Any similar device used to block or isolate energy. <p>Push buttons, selector switches, and other control circuit type devices are not energy isolating devices.</p>
ENERGY SOURCE	Electrical, mechanical, hydraulic, pneumatic, chemical, thermal energy, gravity, or radiation energy source.
INDEPENDENT CONTRACTORS	Any entity that is providing service contracted by the University that is not directly employed by the University working under a contract. They may also be known as contractors, consultants, service representatives, or visitors.
LOCKOUT DEVICE	Any device that uses positive means (e.g., lock, blank flanges, or bolted slip blinds) to hold an energy-isolating device in a safe position, thereby preventing the energizing of machinery or equipment.
NORMAL PRODUCTION OPERATIONS	Utilization of a machine or equipment to perform its intended production function.
POTENTIAL ENERGY	Residual energy that remains stored in machinery or equipment after the machinery or equipment is turned off.
PRIME MOVER	The source of a mechanical power for a machine.
QUALIFIED PERSON	A qualified person is a person designated by the employer and by reason of training, experience, or instruction has demonstrated the ability to perform safely all assigned duties; and, when required, is properly licensed in accordance with federal, state, or local laws and regulations.
SERVICING AND/OR MAINTENANCE	Workplace activities (e.g., constructing, installing, setting up, adjusting, inspecting, modifying, maintaining and/or servicing machines or equipment, including lubrication, cleaning or unjamming of machines or equipment, and making adjustments or tool changes) where employees could be exposed to the unexpected activation or startup of the equipment or release of hazardous energy.

TAGOUT	The practice of using tags in conjunction with locks to increase visibility and awareness that equipment is not to be energized or activated until such devices are removed.
TAGOUT DEVICE	Any prominent warning device (e.g., tag and a means of attachment) that can be securely fastened to an energy-isolating device to indicate that the machine or equipment to which it is attached may not be operated until the tagout device is removed.
ZERO ENERGY STATE	The state in which no residual energy is present in the equipment upon verifying prior to working on equipment.

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4.0 Roles and Responsibilities

Clearly defined roles and responsibilities for a group or organization: (a) minimize chaos and confusion especially during emergencies because everyone knows what to do, (b) maximize internal efficiency, and (c) facilitate management of internal risks.

Managers/Supervisors

Managers/supervisors that supervise employees whose duties involve hazardous energy are required to:

- Develop Standard Operating Procedures specific to equipment and energy source.
- Identify individuals who will be considered Qualified Persons.
- Ensure Job Safety Analysis is completed and record maintained .
- Ensure that authorized and affected employee(s) or student(s) are adequately trained and understands the concept of Lockout/Tagout. Document training in writing.
- Survey potential hazardous energy locations.
- House all Lockout/Tagout devices in a centralized location and know existing locations.
- Procure Lockout/Tagout devices after determining energy source and equipment used.
- Inspect all Lockout/Tagout devices.
- Ensure that staff in charge of equipment maintenance is issued a suitable lock (or locks) and identification tags and are readily available.
- Ensure that contractors have their own documented procedures for Lockout/Tagout; whenever outside servicing personnel (contractors) are to be engaged in activities covered by this section, the on-site employer's Lockout/Tagout procedures shall be followed.
- Ensure the implementation of Lockout/Tagout procedures performed by their staff.

Authorized and Affected Employees

Authorized/Affected Employees, Students, and Visitors are required to:

- Be trained on Lockout/Tagout procedures implemented by the University.
- Be briefed on the strategic plan to implement the Lockout/Tagout procedures.
- Follow step-by-step instructions on how to properly Lockout/Tagout specific equipment.
- Identify energy source to be locked out.
- Complete a Job Hazard Analysis prior to commencing the process and hold a job briefing (see [Appendix C](#)).
- Complete Lockout/Tagout permit and submit to the supervisor (see [Appendix D](#)).
- Notify affected and surrounding personnel on the worksite
- **NOT** operate any equipment with active Lockout/Tagout system present.
- **NOT** tamper with Lockout/Tagout devices.

Project Managers

Project managers are required to communicate the requirements of the Lockout/Tagout program to contractors prior to each project and coordinate Lockout/Tagout throughout each project. Contact injuryprevention@usc.edu for guidance on Lockout/Tagout equipment needed for projects.

Independent Contractors

All personnel performing duties under a contract that are not directly employed by the University are required to adhere to the Lockout/Tagout program and:

- Be able to identify the university's Lockout/Tagout devices.
- Communicate with university employees before initiating a Lockout/Tagout procedure.
- Document training on Lockout/Tagout.
- Complete and submit Lockout/Tagout permit when installing devices.
- Be responsible for own Lockout/Tagout equipment.
- Ensure that Lockout/Tagout is adequate to meet Cal/OSHA and university's standards.

Environmental Health and Safety (EH&S)

The Office of Environmental Health and Safety (EH&S) oversees the administration of the Lockout/Tagout Program, but ultimate responsibility for its implementation is with each department.

EH&S responsibilities:

- Develop and maintain the USC Lockout/Tagout Program, and ensure it meets all applicable regulatory requirements.
- Provide technical assistance and training.
- Conduct a periodic inspection of the energy control procedures at least annually to evaluate their continued effectiveness and determine necessity for updating written procedures such as new equipment, new source introduced or location.
- Communicate all information to all affected university departments of program requirements.
- Recommend Lockout/Tagout devices to personnel.
- Provide guidance in developing Standard Operating Procedures (see [Appendix A](#)).
- Coordinate with supervisors to inventory energy sources (see [Appendix B](#)).



5.0 Types of Lockout/Tagout Systems

The type of Lockout/Tagout devices will be determined upon completion of the Job Hazard Assessment to identify the energy source. Training on the application and limitation of the Lockout devices will be dependent on the type of energy source. They include but not limited to:

- Padlocks
- Cable lockouts
- Electrical lockouts
- Circuit Breaker lockout
- Flange lockouts
- Gas cylinder lockouts
- Locking confined space covers
- Pneumatic lockouts
- Valve lockouts
- Blinds
- Blockout devices/Support stands
- The removal of vehicle keys and complete possession of such keys

Ensure Lockout devices are capable of withstanding the environment to which they are exposed for the maximum period of time that exposure is expected.

Ensure Tagout devices are constructed and printed so that exposure to weather conditions or wet and damp locations will not cause the tag to deteriorate or the message on the tag to become illegible. Tags with zip ties must be able to withstand the unlocking strength of 50 lbs.

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6.0 Assessments

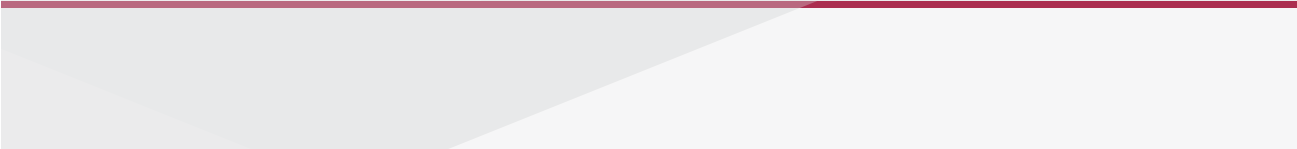
Assessments of the Lockout/Tagout procedures shall be performed before engaging in any duties that involve hazardous energy to determine proper methodology and equipment to secure a zero-energy state. Guidance in assessing Lockout/Tagout procedures are found in the Standard Operating Procedure for the type of equipment, on the Lockout/Tagout Permit, and also when completing the Job Hazard Analysis form. The assessment will also determine whether employees may be exempted from the LOTO program as defined in [Section 4](#) of this written program. The assessment includes:

- Workplace location
- Energy source
- Stored energy
- Equipment to be locked or tagged out
- Method of shutting down
- Personal Protective Equipment
- Authorized personnel
- Affected employees

The assessment is used as a warning and alerting technique to protect employees from hazards in addition to hazardous energy while determining the scope and duration of the work to be performed. Additional measures include jack stands below vehicles during servicing and maintenance or using wheel chocks.

Shutting down one equipment may affect other equipment and/or adjoining buildings. Assessing the process will identify other equipment that may need to be shut down in conjunction with the primary equipment. During the assessment, if personnel discover defects in a location or equipment being used, notify the supervisor immediately for corrective actions to be taken.

Tags alone may not be ideal when working around hazardous energy because they may be susceptible to damage and are easier to remove. Some tags, if left for a long period of time, succumb to wear and tear and could fall off equipment. These factors need to be taken into consideration before determining the use of tags alone. Contact injuryprevention@usc.edu for guidance.



The Tagout method should not be used as a primary option when performing maintenance. When an energy isolating device is not capable of being locked out, a tag may be used in its place along with additional measures to ensure the safety of other personnel that may include:

- Additional communication between employees
- Accountability of employees
- Restricted area
- Signs and placarding
- Document procedure
- Periodic check to verify if tag is still in place

Address the aforementioned issue with the supervisor to create a plan that will Lockout equipment in future projects. Plans include:

- Adding metal hasps around isolating energy device
- Isolating devices by adding covers
- Ensuring new equipment being purchased has the capability to be locked out



7.0 Lockout/Tagout Procedures

Preparation

Identify the energy source and equipment to be worked on to have an understanding of the process and additional hazards for controlling energy. Ensure adequate Lockout/Tagout equipment is readily available and inspected prior to commencing work. Assign qualified personnel to perform the work and notify affected employees of the process. Discuss method of dissipating stored energy of an equipment and the manner in which to block energy by blinding or double block and bleed.

Employees authorized to perform Lockout/Tagout shall be certain as to which switch, valve, or other energy isolating devices apply to the equipment being locked out. More than one energy source (e.g., electrical, mechanical, hydraulic, pneumatic, or others) may be involved. Any questionable identification of sources shall be cleared by the employee's supervisor prior to commencing work.

Process may vary due to personnel or equipment; employees will refer to Standard Operating Procedures or Job Hazard Analysis for step by step procedures on the specific area and energy.

Lockout

- Complete permit form and maintain on site until the job is complete.
- Notify all employees working on or around equipment where Lockout/Tagout is required and verify that the equipment cannot be activated.
- Verify that no personnel are exposed and that the energy sources are disconnected.
- If the equipment is in operation, shut it down by the normal stopping procedure (e.g., depress stop button, open toggle switch, etc.).
- Operate the switch, valve, or other energy-isolating devices so that the energy source(s) is/are disconnected or isolated from the equipment. Stored energy, such as that in capacitors, springs, elevated machine members, rotating flywheels, hydraulic systems, air, gas, steam or water pressure, must also be dissipated or restrained by methods such as grounding, repositioning, blocking, or bleeding down.
- Lockout energy by isolating devices with an assigned individual lock.
- Attempt to activate the device to make certain the equipment will not operate (CAUTION: Return operating controls to neutral position after the test).
- All sources of energy must be dissipated including gravitational force and circuit capacitors.
- A "Zero-Energy State" must exist in the equipment before servicing or maintaining.
- No safety devices shall be removed or overridden.

Testing/Adjusting Equipment during Lockout

In situations where equipment needs to be moved, precautions need to be taken per [Cal/OSHA Section 3314](#):

- The operating station where the machine may be activated must at all times be under the control of a qualified operator or craftsman.
- All participants must be in clear view of the operator or in positive communication with each other.
- All participants must be beyond the reach of machine elements which may move rapidly and present a hazard to them.
- Where machine configuration or size requires that the operator leave his control station to install tools, and where machine elements exist which may move rapidly if activated, such elements must be separately locked out by positive means.
- During repair procedures where mechanical components are being adjusted or replaced, the machine shall be de-energized or disconnected from its power source.

Tagout Information

Tag the disconnecting means with suitable accident prevention tags conforming to the provisions of [Cal/OSHA Section 2320.6](#) and [CCR Title 8 Section 3314\(e\)](#). Minimum information on tag includes:

- Reason for placing tag
- Name of person placing the tag and how that person may be contacted
- Date tag was placed

Restoring Equipment to Service

After the work is completed and the equipment is ready to be returned to normal operation:

- Remove all non-essential items (e.g. tools, work supplies); perform housekeeping.
- See that all equipment components are re-installed, including guards and safety devices.
- Repair or replace defective guards before removing lockouts.
- Remove each Lockout/Tagout device using the correct removal sequence.
- Do not operate equipment if guards or other safety devices are missing. If equipment needs to be operated, refer to **Testing/Adjusting Equipment during Lockout** section above.
- Make a visual check before restoring energy, and ensure that everyone is physically clear of the equipment.

If the individual who initiated the Lockout/Tagout procedure is not present and the device needs to be removed, the employee's supervisor must make all reasonable efforts in contacting that employee. If the employee cannot be reached, the supervisor may remove the device.

Group Lockout/Tagout

If more than one individual is required to lockout equipment, each shall place his/her own personal lock on energy isolating device(s). The supervisor, or an individual of a work crew designated by a supervisor, with knowledge of the crew, may lockout equipment for the whole crew. In such cases, it may be the responsibility of the individual to carry out all steps of the Lockout/Tagout procedure and inform the crew when it is safe to work on the equipment. Additionally, the designated individual shall not remove a "crew lock" until it is verified that all individuals are cleared and accounted for.

Carry Over to Another Shift

In the event that equipment must remain locked as work is transferred to another shift, the incoming crew members will place their individual locks on the equipment prior to the outgoing staff removing their locks. If a crew lock is being used (see **Group Lockout/Tagout** above), the incoming supervisor or designated person shall be clearly identified to the crew.

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8.0 Audits/Inspections and Maintenance

Audits/Inspections

Audits are used to identify flaws in the system and are conducted on equipment, devices, and the written program. Inspection of the equipment is vital to the Lockout/Tagout program to ensure its efficacy, prevent failures of devices, and increase accountability of devices periodically and before each use.

Areas to audit/inspect:

- Written program for any changes in process, equipment/devices, and regulatory compliance updates
- Devices for any defects
- Housing unit to ensure devices are readily available or in need to be replenished
- Existing Lockout/Tagout implemented on equipment

Any defects identified from the audit shall be reported immediately to the supervisor to take corrective actions.

Maintenance

Lockout/Tagout devices will be stored in a centralized location within their departments when not in use. Upon completing the process, the Lockout/Tagout devices will be returned to their compartments. A visual inspection of the Lockout/Tagout devices shall be completed periodically. If devices are found to be defective, they will be replaced or removed from service.





9.0 Communication

Communication must be established between all Affected Employees working within the surrounding areas, in the form of Standard Operating Procedures, Job Hazard Analysis, Permits, locking devices and tags. All employees, including contractors, must adhere to university policy and make every effort to communicate work practices to affected employees.

Training is performed to identify Lockout/Tagout system to avoid energizing equipment. Only approved locks will be utilized on equipment and machines. Only authorized personnel may remove Lockout/Tagout devices.

A Job Hazard Analysis must be completed at the beginning of any process to assess hazards including energy sources. Review with crew members the measures that will be taken to commence the job and locate any existing Lockout/Tagout system in place. Documents and records will be maintained for one year.

Lockout/Tagout permits will be housed in a centralized location to identify location, purpose and contact info.

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10.0 Training

The scope of training is determined by the employee's job duties, energy source, and equipment. Training is required for all authorized and affected employees and must include:

- Recognition of hazardous sources
- Methods of isolation
- Lockout/Tagout procedures
- Limitations of tags as an energy control
- Requirements

Refresher training shall be conducted when: (a) an incident occurs (accidents or near misses), (b) new equipment or energy source is introduced, (c) duties of the employee change, or (d) when regulations change. However, it is highly recommended to conduct refresher training annually or at least every two years.

The scope of training will be determined by the role of the employee.

- Authorized employees shall be trained on hazardous energy control procedures and on the hazards related to performing activities required for cleaning, repairing, servicing, setting-up and adjusting machinery and equipment.
- Affected employees shall be instructed in the purpose and use of the energy control procedures.
- All other employees, whose work operations may be in an area where energy control procedures may be utilized, shall be instructed about the prohibition relating to attempts to restart or re-energize machines or equipment which are locked out or tagged out.

Such training shall be documented as required by Cal/OSHA [CCR Title 8, Section 3203](#).

Training updates are contingent on changes to energy source, equipment, facility, and location.

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11.0 Documentation and Recordkeeping

Cal/OSHA requires employers to keep records related to all aspects of safety in the workplace. Required records include documents about job safety analysis, inspections, incident investigations, and trainings. Cal/OSHA also requires employers to keep records on hazard evaluations and the corrective actions taken to reduce or control safety risks in the workplace.

NOTE: All training records, inspections, JSA, and other supporting documentation must be maintained by the department for the duration of all workers' employment.

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12.0 Emergency Procedures

For a work-related injury or illness that requires emergency response, follow the procedures on the [Emergency Notification Protocol](#) web page. Post the [1-2-3 Serious Injury Reporting](#) flier in conspicuous areas to help workers become familiar with the process. Contact EHS@usc.edu for printed copies of the poster. NOTE: Work-related injuries and illnesses may be treated at USC-Approved Medical Facilities. Consult the [Workers' Compensation](#) web page for a list of approved facilities.

Non-Serious Injury or Illness Reporting

Even if an injury or illness does not meet the requirements for Cal-OSHA reporting, it is important that the affected employee receives proper care. Review the [Workers' Compensation web page](#) for more information.

Minor Incidents/Near Misses

Non-emergency incidents/near misses which do not result in injury or harmful materials exposure should still be reported to EH&S. If the incident occurs after hours, reporting may be left until the next business day. EH&S will assess the incident and determine if an investigation is warranted.

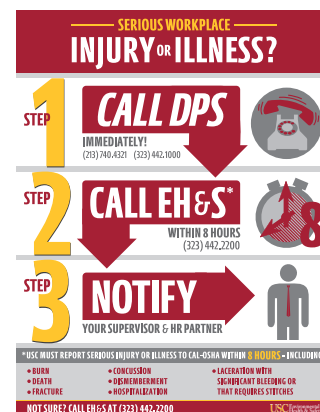
How to Report

The USC Department of Public Safety (DPS) has continuous access to EH&S via a rotating 24-hour EH&S/FSEP on-call personnel. DPS is also the contact between USC and emergency services (fire, ambulance, etc.).

DPS is the first contact in an emergency situation, or when a significant incident needs to be reported outside normal working hours.

- DPS Emergency Numbers: 213.740.4321 (UPC) and 323.442.1000 (HSC)
- DPS Non-Emergency Numbers: 213-740-6000 (UPC) and 323-442-1200 (HSC)

Contact EH&S during normal business hours at (323) 442-2200 to report safety incidents. Further information on emergency notification and incident reporting may be found on the EH&S website (<https://ehs.usc.edu/occhealth/injury-prevention/incident-reporting/>).



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Appendix A General Lockout/Tagout Procedure Sample

SAMPLE 1 - GENERAL LOCKOUT/TAGOUT PROCEDURE

Purpose

This procedure establishes the minimum requirements for lockout of energy sources that could cause injury to personnel. All employees shall comply with the procedure.

Responsibility

The responsibility for seeing that this procedure is followed is binding upon all employees. All employees shall be instructed in the safety significance of the lockout procedure by (designated individual). Each new or transferred affected employee shall be instructed by (designated individuals) in the purpose and use of the lockout procedure.

Preparation for Lockout

Employees authorized to perform lockout shall be certain as to which switch, valve, or other energy isolating devices apply to the equipment being locked out. More than one energy source (electrical, mechanical, or others) may be involved. Any questionable identification of sources shall be cleared by the employees with their supervisors. Before lockout commences, job authorization should be obtained.

Sequence of Lockout Procedure

1. Notify all affected employees that a lockout is required and the reason therefor.
2. If the equipment is operating, shut it down by the normal stopping procedure (such as: depress stop button, open toggle switch).
3. Operate the switch, valve, or other energy isolating devices so that the energy source(s) (electrical, mechanical, hydraulic, other) is disconnected or isolated from the equipment.
4. Lockout energy isolating devices with an assigned individual lock.
5. Stored energy, such as that in capacitors, springs, elevated machine members, rotating fly wheels, hydraulic systems, and air, gas, steam or water pressure, must also be dissipated or restrained by methods such as grounding, repositioning, blocking, bleeding down.
6. 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 certain the equipment will not operate. CAUTION: Return operating controls to neutral position after the test.
7. The equipment is now locked out.

Restoring Equipment to Service

1. When the job is complete and equipment is ready for testing or normal service, check the equipment area to see that no one is exposed.
2. When equipment is clear, remove all locks. The energy isolating devices may be operated to restore energy to equipment.

Procedure Involving More Than One Person

In the preceding steps, if more than one individual is required to lock out equipment, each shall place his/her own personal lock on the energy isolating device(s). One designated individual of a work crew or a supervisor, with the knowledge of the crew, may lock out equipment for the whole crew. In such cases, it may be the responsibility of the individual to carry out all steps of the lockout procedure and inform the crew when it is safe to work on the equipment. Additionally, the designated individual shall not remove a crew lock until it has been verified that all individuals are clear.

Rules for Using Lockout Procedure

All equipment shall be locked out to protect against accidental or inadvertent operation when such operation could cause injury to personnel. Do not attempt to operate any switch, valve, or other energy isolating device bearing a lock.

SAMPLE 2 - EQUIPMENT LOCKOUT/TAGOUT PROCEDURE



Equipment Number <i>0600 - 01</i>	Equipment Type <i>Motor 1</i>	MCC <i>019</i>	Row <i>B</i>	Bucket <i>01</i>	Department <i>Board Plant</i>
Equipment Name <i>Belt Transfer On-Rolls Table No. 1</i>				MCC Location <i>Old Boiler Room</i>	

Potential Hazards:	<input type="checkbox"/> Electrical	<input checked="" type="checkbox"/> Pneumatic	<input type="checkbox"/> Mechanical	<input checked="" type="checkbox"/> Multiple Lockouts
	<input type="checkbox"/> Hydraulic	<input type="checkbox"/> Chemical	<input type="checkbox"/> Combustables	<input type="checkbox"/> Confined Space

Methods of Neutralizing Energy:	<input checked="" type="checkbox"/> Relieve Pressure	<input type="checkbox"/> Block/Bleed	<input checked="" type="checkbox"/> Lockout/Tagout
	<input type="checkbox"/> Disconnect Lines	<input type="checkbox"/> Set Fire Watch	<input type="checkbox"/> Confined Space Permit

Permits Required:	<input type="checkbox"/> Safe Work	<input type="checkbox"/> Hot Work	<input type="checkbox"/> Line Blanking	<input type="checkbox"/> Confined Space
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Lockout Procedure:

1. Notify Production Supervisor and ALL affected personnel.
2. After completing Step 1, Shut down equipment, if running, as trained. If you are not sure how, contact your supervisor for instructions.
3. Lockout the equipment following the lockout procedure at the WET TRANSFER ON ROLLS cabinet local disconnect on the north wall. This equipment can also be locked out at MCC 19 ROW B bucket 01 in the OLD BOILER ROOM.

Note: Turn off the MAIN Air supply on the North wall to right of the ON ROLL control cabinet and lock the cover. Then isolate both of the surge tanks under the crossover walkway. Close and tag the ball valves before each tank. Push and lock out Dump Valves numbers 4 and 5. LOCK OUT the CROSSBELT #1 at the Crossover walkway local disconnect.

Test the equipment at the "WET END Control Panel" located on the North wall by pushing the "Green Board Transfer start" pushbutton. You can also test this equipment from the crossover pushbutton station at the WET Transfer station by pushing the START SYSTEM pushbutton.

4. After ALL previous steps have been completed, begin your work assignment.
5. After completion of the work, assure that your work area is clean, clear of ALL debris and that ALL guards are secured in place.
6. Notify the Production Supervisor and ALL affected personnel that the equipment is operational and that removal of the lock-outs will occur.
7. Remove ALL locks and tags following the Lock-Out I Tag-Out Program instructions.
8. Prior to start-up of the equipment, inspect the area to ensure that ALL employees, contractors and any other personnel are safely positioned.
9. When production is ready, verify that equipment is operating correctly.
10. Close out any applicable permit/s and return them to your supervisor.

* MCC means Motor Control Center

Review Date:
Revision Date:

SAMPLE 3 - EQUIPMENT LOCKOUT/TAGOUT PROCEDURE



Equipment Number <i>0594 - 01</i>	Equipment Type <i>Motor</i>	MCC * <i>019</i>	Row <i>B</i>	Bucket <i>03</i>	Department <i>Board Plant</i>
Equipment Name <i>Cutoff Knife Drive</i>				MCC Location <i>Old Boiler Room</i>	

Potential Hazards:	<input checked="" type="checkbox"/> Electrical	<input type="checkbox"/> Pneumatic	<input type="checkbox"/> Mechanical	<input checked="" type="checkbox"/> Multiple Lockouts
	<input type="checkbox"/> Hydraulic	<input type="checkbox"/> Chemical	<input type="checkbox"/> Combustables	<input type="checkbox"/> Confined Space
Methods of Neutralizing Energy:	<input type="checkbox"/> Relieve Pressure	<input type="checkbox"/> Block/Bleed	<input checked="" type="checkbox"/> Lockout/Tagout	
	<input type="checkbox"/> Disconnect Lines	<input type="checkbox"/> Set Fire Watch	<input type="checkbox"/> Confined Space Permit	
Permits Required:	<input type="checkbox"/> Safe Work	<input type="checkbox"/> Hot Work	<input type="checkbox"/> Line Blanking	<input type="checkbox"/> Confined Space

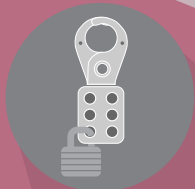
Lockout Procedure:

1. Notify Production Supervisor and ALL affected personnel.
2. After completing Step 1, if running, shut down the equipment as trained. If you are not sure how, SEE YOUR SUPERVISOR.
3. "Lock" and "Tag" the equipment out at the "Knife Drives Cabinet", located across from the knife on the north wall, following the lockout procedure. CAUTION! THE COMPLETE LIVE ROLL SECTION MUST ALSO BE LOCKED OUT. REFER TO THE SPECIFIC LOCKOUT PROCEDURES FOR THAT EQUIPMENT. Test the equipment at the Knife control panel.
4. After ALL the previous steps have been completed, begin your work assignment.
5. After the completion of the work assignment, assure that the work area is clean.
6. Notify the Production Supervisor and/or ALL affected personnel that the equipment is operational and that removal of the lock-outs will occur.
7. Remove ALL locks and tags following the lockout procedure.
8. When production is ready, verify that the equipment is operating correctly.
9. When Production is ready, verify that equipment is operating correctly.
10. Close out any applicable permit/s and return them to your supervisor.

* MCC means Motor Control Center

Review Date:
Revision Date:

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Appendix B Energy Source Audit

Equipment Audit - Energy Source Determination

Equipment name: _____ Date: _____
Model Number: _____ Inspected by: _____
Serial Number: _____ Reviewed by: _____
Location: _____

Select each type of hazardous energy and indicate number of energy isolation/disconnect device(s) that apply:

Hazardous Energy/Power	Energy isolation/disconnect device(s)	Number
Electrical: » Battery » Capacitor	Switch	
	Motor control	
	Power panel	
	Circuit breaker number	
	Other	
	Special precaution/requirements	
Mechanical: » Flywheel	Switch	
	Key	
	Special precautions/requirements	
Potential Energy: » Suspended load (gravity) » Spring	Means to control potential energy	

Make copies as needed for each machine/equipment you wish to audit

Hazardous Energy/Power	Energy isolation/disconnect device(s)	Number
Hydraulic	Main control	
	Shut off valve	
	Bleed/Drain valve	
	Special precautions/requirements	
Pneumatic	Main control	
	Shut off valve	
	Bleed/Drain valve	
	Special precautions/requirements	
Chemical	Main control	
	Shut off valve	
	Blank flanges	
	Bleed/Drain valve	
	Special precautions/requirements	
Thermal	Main control	
	Shut off valve	
	Bleed/Drain valve	
	Special precautions/requirements	
Other hazardous energy source(s)	Please fill in energy isolation/disconnect devices below:	
	Special precautions/requirements	

Make copies as needed for each machine/equipment you wish to audit



Appendix C Job Safety Analysis

INSTRUCTIONS

What is a Job Safety Analysis (JSA)? A JSA is a systematic process to identify potential hazards associated with a particular job/task and the proper controls needed to remove those potential hazards. It further defines relationships between worker, task, tools, and work environment, and establishes work rules and norms for the job/task.

- Complete the sections on Page 1 of the JSA form including detailed information in **Task Description**.
 - Fill in **Assigned Employees**.
 - Check off all **Body Positions**.
 - Check off all **Required Personal Protective Equipment (PPE)** that apply.
 - Add **NOTES** if needed.
- On Page 2, break job tasks into basic steps from start to finish.
 - Begin each step with a verb, for example, "Turn equipment on" or "Place material on equipment" and list sequentially in the **Basic Job Steps (Column 1)**. Attach additional pages if more steps need to be added.
 - Identify the potential hazard or hazards (e.g., rotating parts, fire) associated with each step in **Potential Hazards (Column 2)**. Anticipate hazards for each step as well. Questions to ask: What could fail? What are the consequences? How could it happen? What are other contributing factors? How likely is it that the hazard will occur?
 - Summarize control measures (e.g., post warning signs, work behind a protective shield) for each step in **Control Measures (Column 3)**.
- Review the completed JSA (i.e., steps, potential hazards, and control measures) with employees who perform the job/task.
- Create a standard operating procedure (SOP) for the job/task and attach the JSA to it. Ensure that employees read, understand, and sign the SOP.

Job Title:										NEW <input type="checkbox"/>		REVISED <input type="checkbox"/>					
Information																	
School/Department:																	
Location (bldg., room):																	
Supervisor:							Supervisor Sign-Off:										
JSA created by:							Date created:										
Task Description:																	
Assigned Employees																	
1.				5.				9.									
2.				6.				10.									
3.				7.				11.									
4.				8.				12.									
Body Position																	
Bending		<input type="checkbox"/>	Kneeling		<input type="checkbox"/>	Pulling		<input type="checkbox"/>	Reaching		<input type="checkbox"/>	Standing		<input type="checkbox"/>	Other:		<input type="checkbox"/>
Grasping		<input type="checkbox"/>	Lifting		<input type="checkbox"/>	Pushing		<input type="checkbox"/>	Sitting		<input type="checkbox"/>	Squatting		<input type="checkbox"/>	Other:		<input type="checkbox"/>



Required Personal Protective Equipment (PPE)

Gloves		Glasses/Goggles		Body		Other		Frequency	
Nitrile	<input type="checkbox"/>	Splash	<input type="checkbox"/>	Lab Coat, FR ²	<input type="checkbox"/>	Hearing Protection	<input type="checkbox"/>	Daily	<input type="checkbox"/>
Neoprene	<input type="checkbox"/>	Safety	<input type="checkbox"/>	Splash Apron	<input type="checkbox"/>	Respiratory Protection	<input type="checkbox"/>	Weekly	<input type="checkbox"/>
Non-conductive	<input type="checkbox"/>	Face Shield ¹	<input type="checkbox"/>	Apron, FR ²	<input type="checkbox"/>		<input type="checkbox"/>	Monthly	<input type="checkbox"/>
Leather/cut-resistant	<input type="checkbox"/>	Optical Filter	<input type="checkbox"/>	Steel-toe shoes	<input type="checkbox"/>		<input type="checkbox"/>	Other	<input type="checkbox"/>

NOTES

Additional Instructions

- 1) Complete sequence of job steps from start to finish (column 1 only).
- 2) For each job step, list the hazards and control measures (columns 2 and 3).
- 3) Get proper reviews & signoffs (can be electronic).
- 4) Send copy to supervisor and EH&S at injuryprevention@usc.edu.

Basic Job Steps (Column 1) <i>List the basic steps of the job from start to finish</i>	Potential Hazards (Column 2) <i>(e.g., rotating parts, cuts, back strain, slips/falls, electric shock, fire, or chemical exposure)</i>	Control Measures (Column 3) <i>Hierarchy: elimination, substitution, re-engineering, warning signs & systems, training/procedures, & PPE</i>
1.		
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24.		
25.		

¹ Face shield must be worn with safety glasses or splash goggles.² Flame Resistant.



Appendix D Lockout/Tagout Safety Permit

[Lockout/Tagout Safety Permit Sample](#)

Safety Permit		Date: _____
Permit Issued to: _____		Time issued: _____ Expiration time: _____
<input type="checkbox"/> Maintenance <input type="checkbox"/> Outside Contractor Name: _____		
Job description: _____ _____		
CHECKED PRECAUTIONS SHALL BE OBSERVED <div style="display: flex; flex-wrap: wrap;"> <div style="width: 50%;"> <input type="checkbox"/> TAG & DISCONNECT ELECTRIC EQUIPMENT <input type="checkbox"/> LINES BLINDED <input type="checkbox"/> VALVES CLOSED & TAGGED <input type="checkbox"/> LOCKED OUT <input type="checkbox"/> LINES DISCONNECTED <input type="checkbox"/> BLEEDERS OPEN </div> <div style="width: 50%;"> <input type="checkbox"/> FIRE EXTINGUISHER AT SITE <input type="checkbox"/> CONTAINS SPARKS <input type="checkbox"/> KEEP AREA FREE OF COMBUSTIBLES <input type="checkbox"/> BARRICADE AREA <input type="checkbox"/> SHIELD ARC </div> </div>	PROTECTIVE EQUIPMENT REQUIRED <div style="display: flex; flex-wrap: wrap;"> <div style="width: 50%;"> <input type="checkbox"/> WEAR GOGGLES <input type="checkbox"/> WEAR GLOVES <input type="checkbox"/> WEAR HOOD <input type="checkbox"/> WEAR SUIT </div> <div style="width: 50%;"> <input type="checkbox"/> FACE SHIELDS <input type="checkbox"/> RUBBER THERMAL <input type="checkbox"/> ACID THERMAL <input type="checkbox"/> RUBBER THERMAL </div> <div style="width: 50%;"> <input type="checkbox"/> WEAR RUBBER BOOTS <input type="checkbox"/> WEAR SAFETY BELT & LINE <input type="checkbox"/> WEAR RESPIRATOR DUST CHEMICAL </div> </div>	
OTHER PRECAUTIONS: _____ _____		
PERMIT CONDITIONS AND REQUIREMENTS UNDERSTOOD PLEASE CIRCLE ONE: _____ ENGINEER FOREMAN CRAFTSMAN	APPROVALS SAFETY INSPECTOR _____ <div style="display: flex; justify-content: space-between;"> OPERATIONS FOREMAN _____ <div style="text-align: right;">TIME _____</div> </div> <div style="display: flex; justify-content: space-between;"> OPERATIONS FOREMAN _____ <div style="text-align: right;">TIME _____</div> </div>	
Work must begin within ninety minutes of issuance of this permit. If the work is interrupted the foreman craftsman, or contractor must indicate equipment condition to operations foreman or operator when leaving job for more than two hours or when job is complete.		
<input type="checkbox"/> JOB COMPLETE _____ <input type="checkbox"/> JOB INCOMPLETE _____		
THIS PERMIT IS TO BE KEPT ON THE JOB UNTIL WORK IS COMPLETED, PERMIT EXPIRES OR IS REVOKED		

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