

Lockout/ Blockout

**General conditions that require locking out
and blocking out machinery**

Components of a good lockout program

Different methods of locking out equipment



S-515 revised June 2005

State of California

Department of Industrial Relations - Division of Occupational Safety and Health

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Introduction

Failure to lock out and block out machinery before working on it is a major cause of serious injury and death in California.

Workers are electrocuted—or lose fingers, hands, arms—or suffer severe crushing injuries—because machinery is inadvertently turned on while it is being maintained, repaired or adjusted.

These injuries can be prevented by establishing and using an effective lockout program.

Failure to lock out and block out machinery has caused devastating injury and death to workers, as the following case histories indicate:

- Three men were doing maintenance inside an asphalt pug mill type mixer. One employee was still inside the mixer when the power was turned back on, thereby starting the mixer. He was killed instantly.

Cause: failure to disconnect power source and lock out.

- A cotton gin operator climbed into a jammed cotton cleaner/seperator. The toggle switch controlling the operation of the gin was turned off but not locked out. For some reason, someone accidentally turned the machine back on, not knowing the gin operator was inside the gin. The operator's left leg was pulled through the feed rollers.

Cause: failure to disconnect power source and lock out.

- A warehouseman was repairing an air-operated valve which he had turned off but not disconnected and locked out. During the repair operation he slipped and inadvertently turned on the switch which let air into the valve. His hand was caught and crushed in the valve.

Cause: failure to disconnect power source and lock out.

- A maintenance employee was changing V-belts on an exhaust fan. He de-energized the fan before starting work. However, he did not block

the blades of the fan. The suction in the duct work turned the fan blades, and his hand was caught in the V-belt drive.

Cause: failure to block out potential energy sources.

Lockout/blockout means that any energy source—whether electrical, hydraulic, mechanical, compressed air, or any other source that might cause unexpected movement—must be disengaged or blocked, and electrical sources must be de-energized and LOCKED or positively sealed in the OFF position.

But even a locked-out machine may not be safe if there are parts of the machine that are not BLOCKED to prevent inadvertent movement. Potential energy that may need to be blocked can come from suspended parts, subject to gravity, or may be energy stored in springs.

In a U.S. Bureau of Labor Statistics study on injuries related to servicing equipment, 80 percent of the workers surveyed failed to even turn off the equipment before performing the service work.

There is a difference between turning off a machine and actually disengaging or de-energizing a piece of equipment. When you turn off a control switch, you are opening a circuit. There is still electrical energy at the switch, and a short in the switch or someone inadvertently turning on the machine may start the machine running again.

Statistics show that of the 20 percent of the workers who did turn off the machinery, about half of them were injured when someone, generally a coworker who was unaware that the machine was being serviced, accidentally reactivated the machinery.

And a fifth of those workers who turned off the control switch were injured by the energy still in the machine which should have been blocked. The moving parts of the machine either continued to coast, or the parts moved when the jam-up was cleared.

An accident in California illustrates this problem. A table saw was turned off, but the saw blade was still coasting and had not come to a complete stop. An employee began cleaning the machine, and his finger was amputated by the blade.

Other accidents have occurred when the control switch on a machine was turned off, but a short in the switch restarted the machine. Accidents have also occurred even when workers did take the necessary steps of disconnecting the main power source. But they did not perform a crucial step for a complete lockout procedure.

They did not test the equipment to make sure the machinery was, in fact, de-energized.

In one case, the lockout had been done on the wrong power line. In another case, a second power line had been spliced into the wiring beyond the point of the lockout.

To prevent these kinds of lockout/blockout accidents, General Industry Safety Order 3203— in Title 8 of the *California Code of Regulations* — requires every employer to inaugurate and

maintain an accident prevention program which shall include but not be limited to the following:

1. A training program designed to instruct employees in general safe work practices, plus specific instruction with regard to hazards and unique to any job assignments.

2. Scheduled periodic inspections to identify and correct any unsafe conditions and work practices that may be found. The employer shall correct unsafe conditions and work practices found as a result of the required inspections.

To be effective, a lockout/blockout program should include:

- A survey of the equipment by responsible persons who are thoroughly familiar with its operation and associated hazards, in order to identify which machinery should be locked and blocked out.

- Identification and labeling of lockout devices.
- Selection and purchase of locks, tags and blocks.

- A standard operating procedure that is written and followed.

Equipment Survey: Identifying & Labeling the Energy Disconnecting Means

Make an initial survey of the plant or operation to identify all energy sources.

This must be done by physical inspection, possibly in combination with a study of drawings and equipment manuals.

Locate and mark the disconnecting means, indicating their function. Categorize the identification details as to equipment supplied and energy type and magnitude, from material worked out beforehand in this lockout/blockout program planning study.

Example:

Line #1, Press #4, Electrical 480 volts

A sign or sticker—“LOCKOUT HERE”— placed at the disconnecting means will help direct workers to correct lockout devices.

After surveying the operation, additional and more practical means may be installed.

In complicated operations, schematics of just the disconnecting means may need to be drawn up by the plant's engineering department.

Methods of Locking Out Controls

There are many different ways to lock out a piece of equipment. Commonly, the main disconnect switch has one opening where a lock can be placed.

If more than one employee works on the equipment, a lockout adaptor suitable for the installation of several locks must be used, enabling all workers to lock out the machine with their individual locks. See *Figure 1*.

If the switches are in a metal box, the box itself must be locked out. See *Figure 2*.

If a fuse was removed in order to de-energize the equipment, the fuse box must be locked.

If the controls are in a metal-covered box, a common hasp can be welded or riveted to the door, along with a lock staple. Then the switch can be “opened” and the door closed and padlocked.

Fuse boxes can also be locked in this way.

Machines activated by compressed air or steam will have valves that control movement. These valves will need not only to be locked out, but also bled to release any back pressure.

Figures 3 and 4 show types of bleeder valves that can be locked out.

Lockout Procedure Requirements

1. All maintenance personnel are issued a suitable lock (or locks). The lock has the individual worker’s name and other identification on it. Each worker has the only key to the lock.

2. The worker checks to be sure that no one is operating the machinery BEFORE turning off the power. The machine operator is informed before the power is turned off. Sudden loss of power could cause an accident.

3. Steam, air, and hydraulic lines should be bled, drained, and cleaned out. There should be no pressure in these lines or in reservoir tanks.

4. Any mechanism under load or pressure, such as springs, should be released and blocked.

5. Each person who will be working on the machinery should put a lock on the machine’s lockout device(s). Each lock must remain on the machine until the work is completed.

Only the worker who placed the lock should remove his/her lock.

6. *All energy sources which could activate the machine must be locked out.*

7. The main valve or main electrical disconnect must be tested to be sure that the power to the machine is off.

8. Electrical circuits must be checked by qualified persons with proper and calibrated electrical testing equipment. An electrical failure could energize the equipment, even if the switch is in the off position. Stored energy in electrical capacitors should be safely discharged.

9. CAUTION: Return disconnects and operating controls to the off position after each test.

10. Attach accident prevention tags which give the reason for placing the tag, the name of the person placing the tag, how he/she may be contacted, and the date and time the tag was placed. *No one removes the lock without proper authority.*

Figure #1

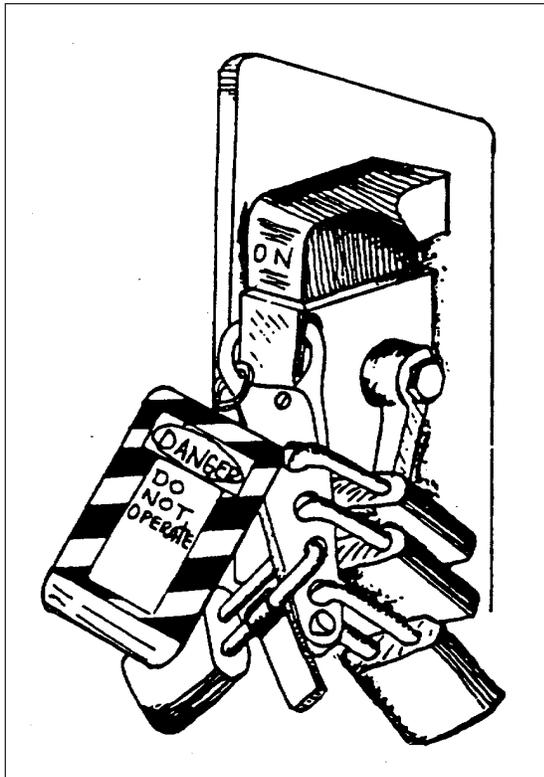


Figure #4

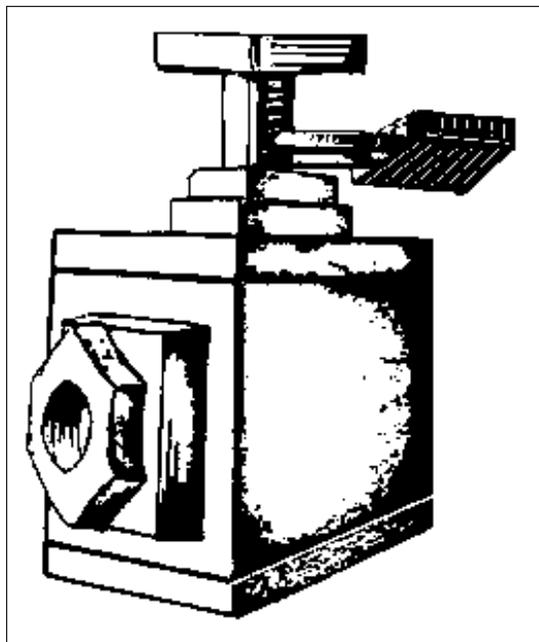


Figure #2

Figure 2 adapted from Machinery Lockout by Employers Insurance of Wausau, 1982.

Figure 3 reprinted from Concepts and Techniques of Machine Safeguarding. OSHA Publication 3067, 1981.

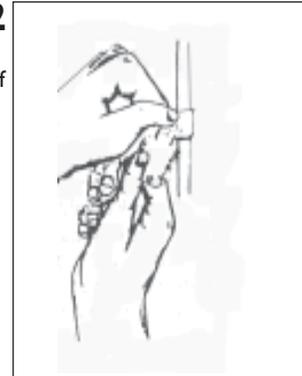
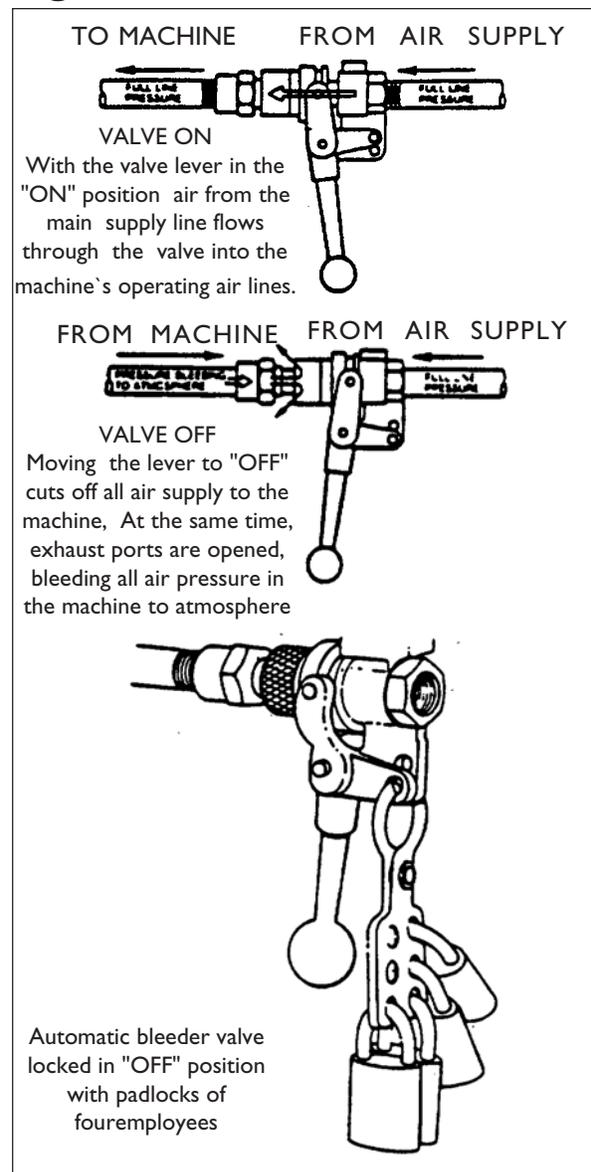


Figure #3



Locks, Blocks, & Accident Prevention Tags

Locks

Each worker must have his/her own lock and the only key to that lock.

The lock should be substantial and durable, and should have the name of the employee on it. In addition, locks can be color-coded to indicate different shifts or types of crafts.

When more than one worker is servicing a piece of equipment that must be locked out, a lockout adaptor can be used which allows all the workers to place their locks on the disconnecting means. After the work is completed, each worker removes his/her lock and the machine is then returned to service.

Tags

DO NOT USE TAGS ALONE. Use tags or signs in addition to locks.

Tags must state the:

- reason for the lockout.
- name of the employee who is working on the equipment and how that person may be reached.
- date and time the tag was put in place.

Tagout devices shall be capable of enduring at least 50 pounds of pull, and a non-reusable type.

Blocks

Suitable blocks are another important safety device for making a piece of equipment safe to be repaired or serviced. Blocks must be placed under raised dies, lifts, or any equipment that might inadvertently move by sliding, falling or rolling.

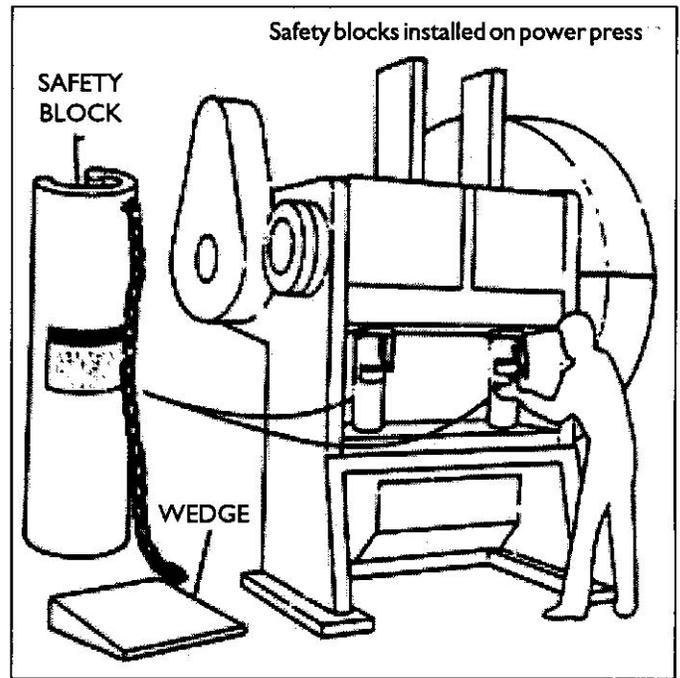
Blocks, special brackets, or special stands such as those commonly used under raised vehicles, must be available and always used.

Another form of blocking is the placement of a blind. A blind is a disk of metal placed in a pipe to ensure that no air, steam, or other substance will pass through that point if the system is accidentally activated.

Before installing blinds or blocks, bleed down steam, air, or hydraulic lines to get rid of any pressure. Coiled springs, spring-loaded devices, or suspended loads must also be released so that their stored energy will not result in inadvertent movement. See *Figure 5*.

Figure 5

Figure 5 reprinted from *Concepts and Techniques of Machine Safeguarding*, OSHA Publication OSHA 3067, 1981.



Written Standard Operating Procedure

A lockout usually requires coordination between the production and maintenance departments.

It frequently extends over two shifts, which adds to the number of employees involved and complicates portions of the lockout/blockout procedure.

The best way to put into practice an effective lockout program is to first prepare a written, standardized operating procedure, then carry out the necessary training and responsible supervision.

In a check list format, prepare a written sequence for access, de-energizing, lockout, clearance, release, and start-up.

Also consider stored energy. Conditions not hazardous during normal operations can become hazardous when guards are removed during maintenance and servicing.

In writing a lockout procedure, consider:

- job objectives and equipment involved.
- detailing the energy sources for each machine and lockout procedures.
- steps for shutting down and securing machinery.
- steps to verify lockout effectiveness.
- procedural steps for applying lockout and tagout.
- procedural steps for restarting.
- employees authorized to perform lockout.
- annual compliance audit.

In training for lockout procedure, consider:

- Employees must understand what equipment tagout means, and what to do if they want to operate it.
- The authorized person must be trained in written procedure and fully knowledgeable of hazardous energies specifically related to equipment.
- Employees reassigned to different equipment must be retrained.
- Contractors working on site must have a general understanding of lockout/tagout and follow the employer's procedures.

In large and complex facilities, permits signed by designated supervisors should be obtained before a lockout is begun. See *sample permit in this publication*.

A signed permit is particularly important if maintenance work is being performed by an outside contractor who may be familiar with the particular piece of equipment being serviced, but who will not know about the plant's operation overall.

Testing Equipment During Lockout

In many maintenance and repair operations, machinery may need to be tested—and for that purpose, energized before additional maintenance work can be performed.

This procedure must be followed:

1. Clear all personnel to safety.
2. Clear away tools and materials from equipment.
3. Remove lockout devices and re-energize systems, following the established safe procedure.
4. Proceed with tryout or test.
5. Neutralize all energy sources once again, purge all systems, and lockout prior to continuing work.

Equipment design and performance limitations may dictate that effective alternative worker protection be provided when the established lockout procedure is not feasible.

If machinery must be capable of movement in order to perform a maintenance task, such as a cleaning operation, workers can use extension tools—extended swabs, brushes, scrapers—to protect themselves from injury.

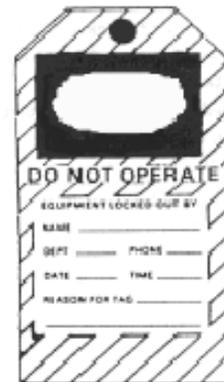
Restoring Equipment to Service

After the work is completed and the equipment is ready to be returned to normal operation, this procedure must be followed:

1. Remove all non-essential items.
2. See that all equipment components are operationally intact, including guards and safety devices.
3. Repair or replace defective guards before removing lockouts.
4. Remove each lockout device using the correct removal sequence.
5. Make a visual check before restoring energy to ensure that everyone is physically clear of the equipment.

If you have questions or concerns, or if you need additional information on lockout/blockout procedures, for free assistance contact the Cal/OSHA Consultation Service office in your area. Addresses and phone numbers are listed on the inside front cover of this publication.

Sample Tag



DANGER

Sample Safety Permit

S A F E T Y P E R M I T		DATE _____
<u>PERMIT ISSUED TO</u>		TIME ISSUED _____
<input type="checkbox"/> MAINTENANCE	<input type="checkbox"/> OUTSIDE CONTRACTOR NAME _____	EXPIRATION TIME _____
JOB DESCRIPTION _____		

CHECKED PRECAUTIONS SHALL BE OBSERVED <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 <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	PROTECTIVE EQUIPMENT REQUIRED <input type="checkbox"/> WEAR GOGGLES FACE SHIELD <input type="checkbox"/> WEAR GLOVES RUBBER THERMAL <input type="checkbox"/> WEAR HOOD ACID THERMAL <input type="checkbox"/> WEAR SUIT RUBBER THERMAL <input type="checkbox"/> WEAR RUBBER BOOTS <input type="checkbox"/> WEAR SAFETY BELT & LINE <input type="checkbox"/> WEAR RESPIRATOR DUST CHEMICAL	
OTHER PRECAUTIONS _____		

PERMIT CONDITIONS & REQUIREMENTS UNDERSTOOD _____ _____	APPROVALS SAFETY INSPECTOR _____ OPERATIONS FOREMAN _____ TIME _____ OPERATIONS FOREMAN _____ TIME _____	
SIGNED ENGINEER-FOREMAN-CRAFTSMAN _____		
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 COMPLETED _____ <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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Sample Lockout Procedure

LOCKOUT

Lockout procedure for _____
(name of your company)

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. Stored energy, such as that in capacitors, springs, elevated machine members, rotating flywheels, hydraulic systems, and air, gas, steam or water pressure, must also be dissipated or restrained by methods such as grounding, repositioning, blocking, bleeding down.
- 4) Lockout energy isolating devices with an assigned individual lock.
- 5) 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.
- 6) 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.

Lockout/Blockout

Applicable Safety Orders

3203. Injury and Illness Prevention Program.

(a) Effective July 1, 1991, every employer shall establish, implement and maintain an effective Injury and Illness Prevention Program (Program). The Program shall be in writing and shall, at a minimum:

(1) Identify the person or persons with authority and responsibility for implementing the Program.

(2) Include a system for ensuring that employees comply with safe and healthy work practices. Substantial compliance with this provision includes recognition of employees who follow safe and healthful work practices, training and retraining programs, disciplinary actions, or any other such means that ensures employee compliance with safe and healthful work practices.

(3) Include a system for communicating with employees in a form readily understandable by all affected employees on matters relating to occupational safety and health, including provisions designed to encourage employees to inform the employer of hazards at the worksite without fear of reprisal. Substantial compliance with this provision includes meetings, training programs, posting, written communications, a system of anonymous notification by employees about hazards, labor/management safety and health committees, or any other means that ensures communication with employees.

Exception: Employers having fewer than 10 employees shall be permitted to communicate to and instruct employees orally in general safe work practices with specific instructions with respect to hazards unique to the employees' job assignments as compliance with subsection (a)(3).

(4) Include procedures for identifying and evaluating workplace hazards including scheduled periodic inspections to identify unsafe conditions and work practices. Inspections shall be made to identify and evaluate hazards:

(A) When the Program is first established;

Exception: Those employers having in place on July 1, 1991 a written Injury and Illness Prevention Program complying with previously existing section 3203.

(B) Whenever new substances, processes, procedures, or equipment are introduced to the workplace that represent a new occupational safety and health hazard; and

(C) Whenever the employer is made aware of a new or previously unrecognized hazard.

(5) Include a procedure to investigate occupational injury or occupational illness.

(6) Include methods and/or procedures for correcting unsafe or unhealthy conditions, work practices and work procedures in a timely manner based on the severity of the hazard:

(A) When observed or discovered; and

(B) When an imminent hazard exists which cannot be immediately abated without endangering employee(s) and/or property, remove all exposed personnel from the area except those necessary to correct the existing condition. Employees necessary to correct the hazardous condition shall be provided the necessary safeguards.

(7) Provide training and instruction:

(A) When the Program is first established;

Exception: Employers having in place on July 1, 1991 a written Injury and Illness Prevention Program complying with the previously existing Accident Prevention Program in section 3203.

(B) To all new employees;

(C) To all employees given new job assignments for which training has not previously been received;

(D) Whenever new substances, processes, procedures or equipment are introduced to the workplace and represent a new hazard;

(E) Whenever the employer is made aware of a new or previously unrecognized hazard; and

(F) For supervisors to familiarize themselves with the safety and health hazards to which employees under their immediate direction and control may be exposed.

(b) Records of the steps taken to implement and maintain the Program shall include:

(1) Records of scheduled and periodic inspections required by subsection (a)(4) to identify unsafe conditions and work practices, including person(s) conducting the inspection, the unsafe conditions and work practices that have been identified, and action taken to correct the identified unsafe conditions and work practices. These records shall be maintained for three (3) years; and

Exception: Employers with fewer than 10 employees may elect to maintain the inspection records only until the hazard is corrected.

(2) Documentation of safety and health training required by subsection (a)(7) for each employee, including employee name or other identifier, training dates, type(s) of training, and training providers. This documentation shall be maintained for three (3) years.

Exception No. 1: Employers with fewer than 10 employees can substantially comply with the documentation provision by maintaining a log of instructions provided to the employee with respect to the hazards unique to the employee's job assignment when first hired or assigned new duties.

Exception No. 2: Training records of employees who have worked for less than one (1) year for the employer need not be retained beyond the term of employment if they are provided to the employee upon termination of employment.

Exception No. 3: For employers with fewer than 20 employees who are in industries that are not on a designated list of high-hazard industries established by the Department of Industrial Relations (Department) and who have a Workers' Compensation Experience

Modification Rate of 1.1 or less, and for any employers with fewer than 20 employees who are in industries on a designated list of low-hazard industries established by the Department, written documentation of the Program may be limited to the following requirements:

A. Written documentation of the identity of the person or persons with authority and responsibility for implementing the Program as required by subsection (a)(1).

B. Written documentation of scheduled periodic inspections to identify unsafe conditions and work practices as required by subsection (a)(4).

C. Written documentation of training and instruction as required by subsection (a)(7).

Exception No. 4: Local governmental entities (any county, city, city and county, or district, or any public or quasi-public corporation or public agency therein, including any public entity, other than a state agency, that is a member of, or created by, a joint powers agreement) are not required to keep records concerning the steps taken to implement and maintain the Program.

Note 1: Employers determined by the Division to have historically utilized seasonal or intermittent employees shall be deemed in compliance with respect to the requirements for a written Program if the employer adopts the Model Program prepared by the Division and complies with the requirements set forth therein.

Note 2: Employers in the construction industry who are required to be licensed under Chapter 9 (commencing with Section 7000) of Division 3 of the Business and Professions Code may use records relating to employee training provided to the employer in connection with an occupational safety and health training program approved by the Division, and shall only be required to keep records of those steps taken to implement and maintain the program with respect to hazards specific to the employee's job duties.

(c) Employers who elect to use a labor/management safety and health committee to comply with the communication requirements of subsection (a)(3) of this section shall be presumed to be in substantial compliance with subsection (a)(3) if the committee:

(1) Meets regularly, but not less than quarterly;

(2) Prepares and makes available to the affected employees written records of the safety and health issues discussed at the committee meetings and maintained for review by the Division upon request. The committee meeting records shall be maintained for three (3) years;

(3) Reviews results of the periodic, scheduled worksite inspections;

(4) Reviews investigations of occupational accidents and causes of incidents resulting in occupational injury, occupational illness, or exposure to hazardous substances, and where appropriate, submits suggestions to management for the prevention of future incidents;

(5) Reviews investigations of alleged hazardous conditions brought to the attention of any committee member. When determined necessary by the committee, the committee may conduct its own inspection and investigation to assist in remedial solutions;

(6) Submits recommendations to assist in the evaluation of employee safety suggestions; and

(7) Upon request from the Division, verifies abatement action taken by the employer to abate citations issued by the Division.

3314. The Control of Hazardous Energy for the Cleaning, Repairing, Servicing, Setting-Up, and Adjusting Operations of Prime Movers, Machinery and Equipment, Including Lockout/Tagout

(a) Application.

(1) This Section applies to the cleaning, repairing, servicing, setting-up and adjusting of machines and equipment in which the unexpected energization or start up of the machines or equipment, or release of stored energy could cause injury to employees.

(2) For the purposes of this Section, cleaning, repairing, servicing and adjusting activities shall include unjamming prime movers, machinery and equipment.

(3) Requirements for working on energized electrical systems are prescribed in Sections 2320.9 or 2940.

(b) Definitions:

Affected employee. For the purpose of this section, an employee whose job requires them to operate or use a machine or equipment on which cleaning, repairing, servicing, setting-up or adjusting operations are being performed under lockout or tagout, or whose job requires the employee to work in an area in which such activities are being performed under lockout or tagout.

Authorized employee or person. For the purposes of this section, a qualified person who locks out or tags out specific machines or equipment in order to perform cleaning, repairing, servicing, setting-up, and adjusting operations on that machine or equipment. An affected employee becomes an authorized employee when that employee's duties including performing cleaning, repairing, servicing, setting-up and adjusting operations covered under this section.

Locked out. The use of devices, positive methods and procedures, which will result in the effective isolation or securing of prime movers, machinery and equipment from mechanical, hydraulic, pneumatic, chemical, electrical, thermal or other hazardous energy sources.

Normal Production Operations. The utilization of a machine or equipment to perform its intended production function.

Prime Mover. The source of mechanical power for a machine.

(c) Cleaning, Servicing and Adjusting Operations.

Machinery or equipment capable of movement shall be stopped and the power source de-energized or disengaged, and, if necessary, the moveable parts shall be mechanically blocked or locked out to prevent inadvertent movement, or release of stored energy during cleaning, servicing and adjusting operations. Accident prevention signs or tags or both shall be placed on the controls of the power source of the machinery or equipment.

(1) If the machinery or equipment must be capable of movement during this period in order to perform the specific task, the employer shall minimize the hazard by providing and requiring the use of extension tools (eg., extended swabs, brushes, scrapers) or other methods or means to protect employees from injury due to such movement. Employees shall be made familiar with the safe use and maintenance of such tools, methods or means, by thorough training.

(d) Repair Work and Setting-Up Operations.

Prime movers, equipment, or power-driven machines equipped with lockable controls or readily adaptable to lockable controls shall be locked out or positively sealed in the "off" position during repair work and setting-up operations. Machines, equipment, or prime movers not equipped with lockable controls or readily adaptable to lockable controls shall be considered in compliance with Section 3314 when positive means are taken, such as de-energizing or disconnecting the equipment from its source of power, or other action which will effectively prevent the equipment, prime mover or machine from inadvertent movement or release of stored energy. In all cases, accident prevention signs or tags or both shall be placed on the controls of the equipment, machines and prime movers during repair work and setting-up operations.

Exceptions to subsections (c) and (d):

I. Minor tool changes and adjustments, and other minor servicing activities, which take place during normal production operations are not covered by the requirements of Section 3314 if they are routine,

repetitive, and integral to the use of the equipment or machinery for production, provided that the work is performed using alternative measures which provide effective protection.

2. Work on cord and plug-connected electric equipment for which exposure to the hazards of unexpected energization or start up of the equipment is controlled by the unplugging of the equipment from the energy source and by the plug being under the exclusive control of the employee performing the work.

3. Where an employer has a uniform system with unique and personally identifiable locks designed for lockout, that are placed on the source of energy, accident prevention signs or tags are not required.

(e) Materials and Hardware. The employer shall provide accident prevention signs, tags, padlocks, seals or other similarly effective means which may be required for cleaning, servicing, adjusting, repair work or setting-up operations. Signs, tags, padlocks, and seals shall have means by which they can be readily secured to the controls. Tagout device attachment means shall be of a non-reusable type, attachable by hand, self-locking, and non-releasable with a minimum unlocking strength of no less than 50 pounds.

(f) Repetitive Process Machines. On repetitive process machines, such as numerical control machines, which require power or current continuance to maintain indexing and where repair, adjustment, testing, or setting-up operations cannot be accomplished with the prime mover or hazardous energy source disconnected, such operations may be performed under the following conditions:

(1) The operating station where the machine may be activated must at all times be under the control of a qualified operator or craftsman.

(2) All participants must be in clear view of the operator or in positive communication with each other.

(3) All participants must be beyond the reach of machine elements which may move rapidly and present a hazard to them.

(4) 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.

(5) During repair procedures where mechanical components are being adjusted or replaced, the machine shall be de-energized or disconnected from its power source.

Note: "Participant" shall mean any other person(s) engaged in the repair, adjustment, testing, or setting up operation in addition to the qualified operator or craftsman having control of the machine operating station.

(g) Hazardous Energy Control Procedures. A hazardous energy control procedure shall be developed and utilized by the employer when employees are engaged in the cleaning, repairing, servicing, setting-up or adjusting of prime movers, machinery and equipment.

(1) The procedure shall clearly and specifically outline the scope, purpose, authorization, rules, and techniques to be utilized for the control of hazardous energy, and the means to enforce compliance, including but not limited to, the following:

(A) A statement of the intended use of the procedure;

(B) The procedural steps for shutting down, isolating, blocking and securing machines or equipment to control hazardous energy;

(C) The procedural steps for the placement, removal and transfer of lockout devices and tagout devices and responsibilities; and,

(D) The requirements for testing a machine or equipment, to determine and verify the effectiveness of lockout devices, tagout devices and other hazardous energy control devices.

(2) The employer's hazardous energy control procedures shall be documented in writing.

(A) The employer's hazardous energy control procedure shall include separate procedural steps for the safe lockout/tagout of each machine or piece of equipment affected by the hazardous energy control procedure.

Exception to subsection (g)(2)(A): The procedural steps for the safe lockout/tagout of prime movers, machinery or equipment may be used for a group or type of machinery or equipment, when either of the following two conditions exist:

(1) Condition 1:

(A) The operational controls named in the procedural steps are configured in a similar manner, and

(B) The locations of disconnect points (energy isolating devices) are identified, and

(C) The sequence of steps to safely lockout or tagout the machinery or equipment are similar.

(2) Condition 2: The machinery or equipment has a single energy supply that is readily identified and isolated and has no stored or residual hazardous energy.

(h) Periodic inspection.

The employer shall conduct a periodic inspection of the energy control procedure(s) at least annually to evaluate their continued effectiveness and determine necessity for updating the written procedure(s).

(1) The periodic inspection shall be performed by an authorized employee or person other than the one(s) utilizing the hazardous energy control procedures being inspected.

(2) Where lockout and/or tagout is used for hazardous energy control, the periodic inspection shall include a review between the inspector and authorized employees of their responsibilities under the hazardous energy control procedure being inspected.

(3) The employer shall certify that the periodic inspections have been performed. The certification shall identify the machine or equipment on which the hazardous energy control procedure was being utilized, the date of the inspection, the employees included in the inspection, and the person performing the inspection.

(i) Whenever outside servicing personnel are to be engaged in activities covered by this section, the on-site employer's lockout or tagout procedures shall be followed.

(j) Training.

(1) 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 prime movers, machinery and equipment.

(2) Each affected employee shall be instructed in the purpose and use of the energy control procedure.

(3) 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 reenergize machines or equipment which are locked out or tagged out.

(4) Such training shall be documented as required by Section 3203.

NOTE

Authority cited: Section 142.3, Labor Code. Reference: Section 142.3, Labor Code.

HISTORY

1. Amendment filed 10-25-74; effective thirtieth day thereafter (Register 74, No. 43).

2. Repealer and new subsections (a), (b) and (c) and amendment of subsection (d) filed 5-12-77; effective thirtieth day thereafter (Register 77, No. 20).

3. Amendment of subsection (c) and adoption of subsections (f)-(i) filed 12-23-91; operative 1-22-92 (Register 92, No. 12).

4. Amendment of subsections (a) and (b) filed 3-24-94; operative 4-25-94 (Register 94, No. 12).

5. Amendment of section heading and section filed 12-7-2004; operative 1-6-2005 (Register 2004, No. 50).

6004. Accident Prevention Tags.

(b) Definitions.

“Major message” means that portion of a tag’s inscription that is more specific than the signal word and that indicates the specific hazardous condition or the instruction to be communicated to the employee. Examples include: “High Voltage,” “Close Clearance,” “Do Not Start,” or “Do Not Use,” or a corresponding pictograph used with a written text or alone.

“Pictograph” means a pictorial representation used to identify a hazardous condition or to convey a safety instruction.

“Signal word” means that portion of a tag’s inscription that contains the word or words that are intended to capture the employee’s immediate attention.

“Tag” means a device usually made of card, paper, pasteboard, plastic or other material used to identify a hazardous condition.

(c) Use. Tags shall be used as a means to prevent accidental injury or illness to employees who are exposed to hazardous or potentially hazardous conditions, equipment or operations which are out of the ordinary, unexpected or not readily apparent. Tags shall be used until such time as the identified hazard is eliminated or the hazardous operation is completed. Tags need not be used where signs, guarding or other positive means of protection are being used.

(d) General Tag Criteria. All required tags shall meet the following criteria:

(1) Tags shall contain a signal word and a major message.

(A) The signal word shall be either “Danger,” “Caution,” “Biological Hazard,” “BIOHAZARD,” or the biological hazard symbol.

(B) The major message shall indicate the specific hazardous condition or the instruction to be communicated to the employee.

(2) The signal word shall be readable at a minimum distance of five feet or such greater distance as warranted by the hazard.

(3) The tag’s major message shall be presented in either pictographs, written text or both.

(4) The signal word and the major message shall be understandable to all employees who may be exposed to the identified hazard.

(5) All employees shall be informed as to the meaning of the various tags used throughout the workplace and what special precautions are necessary.

(6) Tags shall be affixed as close as safely possible to their respective hazards by a positive means such as string, wire, or adhesive that prevents their loss or unintentional removal.

(e) Danger Tags. Danger tags shall only be used in major hazard situations where an immediate hazard presents a threat of death or serious injury to employees.

(f) Caution Tags. Caution tags shall only be used in minor hazard situations where a non-immediate or potential hazard or unsafe practice

presents a lesser threat of employee injury.

(g) Warning Tags. Warning tags may be used to represent a hazard level between “Caution” and “Danger,” instead of the required “Caution” tag, provided that they have a signal word of “Warning,” an appropriate major message, and otherwise meet the general tag criteria of subsection (d) of this section.

2320.4. De-energized Equipment or Systems.

(a) An authorized person shall be responsible for the following before working on de-energized electrical equipment or systems unless the equipment is physically removed from the wiring system:

(1) Notifying all involved personnel.

(2) Locking the disconnecting means in the “open” position with the use of lockable devices, such as padlocks, combination locks or disconnecting of the conductor(s) or other positive methods or procedures which will effectively prevent unexpected or inadvertent energizing of a designated circuit, equipment or appliance.

Exception: Locking is not required under the following conditions:

1. Where suitable tagging procedures are used, and

2. Where the disconnecting means is accessible only to personnel instructed in these tagging procedures.

(3) Tagging the disconnecting means with suitable accident prevention tags conforming to the provisions of Section 2320.6.

(4) Effectively blocking the operation or dissipating the energy of all stored energy devices which present a hazard, such as capacitors or pneumatic, spring-loaded and like mechanisms.

2320.5. Energizing (or Re-energizing) Equipment or Systems.

(a) An authorized person shall be responsible for the following before energizing equipment or systems which have been de-energized:

(1) Determining that all persons are clear from hazards which might result from the equipment or systems being energized.

(2) Removing locking devices and tags.

A) Locking devices and tags may be removed only by the employee who placed them. Locking devices and tags shall be removed upon completion of the work and after the installation of the protective guards and/or safety interlock systems.

Exception: When the employee has left the premises or is otherwise unavailable, other persons may be authorized by the employer to remove the locking devices and tags in accordance with a procedure determined by the employer.

2320.6. Accident Prevention Tags.

(a) Suitable accident prevention tags shall be used to control a specific hazard. Such tags shall provide the following minimum information:

(1) Reason for placing tag.

(2) Name of person placing the tag and how that person may be contacted.

(3) Date tag was placed.

2530.43. Automatic Restarting.

A motor-running overload device that can restart a motor automatically after overload tripping shall not be installed unless approved for use with the motor it protects. A motor that can restart automatically after shutdown shall not be installed if its automatic restarting can result in injury to persons.

(Title 24, Part 3, Section 430-43.)

2530.86. Motor Not in Sight from Controller.

(a) If a motor and the driven machinery are not in sight from the controller location, the installation shall comply with one of the following

conditions:

(1) The controller disconnecting means shall be capable of being locked in the open position.

(2) A manually operable switch that will disconnect the motor from its source of supply shall be placed in sight from the motor location.

(Title 24, Part 3, Section 430-86.)

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