Corporate Safety and Environmental Affairs

Energy Control Guidelines
Using Lockout/Tagout

CBS CORPORATION

In 1990, OSHA issued the standard on the Control of Hazardous Energy (Lockout/Tagout), 29 CFR 1910.147. This standard, along with Subpart S, 29 CFR 1910.333, on electrical safety work practices, helps safeguard employees from the unexpected startup of machinery and/or equipment and the release of hazardous energy which can cause injury, while they are performing servicing and/or maintenance work. These energy sources include mechanical, hydraulic, pneumatic, chemical, thermal (RF), and electrical.

Some examples of equipment in our industry, which would require lockout/ tagout procedures, are as follows:

- Emergency generators, air conditioners, chillers, cooling units, and make-up air handlers.
- Wood cutting saws, drills, and grinders.
- Moveable satellite antenna units.
- Phasers, ACUs, etc.
- De-icing heaters (electric, propane, or natural gas).

The primary tool for providing protection under the standard is the energy-isolating device – the mechanism that prevents the transmission or release of energy and to which locks or tags are attached. A lockout device provides protection by preventing the machinery and/or equipment from becoming energized. A tagout device provides protection by identifying the energy-isolating device as a source of potential danger. Tagout is a very limited method of controlling energy sources and relies on individuals to understand and respond with appropriate caution.

Regulatory Requirements

The lockout/tagout standard requires that energy control procedures be developed, documented, and used to control potentially hazardous energy whenever workers perform activities covered by the standard. The energy control overview procedures must outline the scope, purpose, authorization, rules, and techniques that will be used to enforce compliance.

When the affected/authorized individual has complete control of the energy sources and a single source can effectively be isolated, a written, detailed procedure is not required for lockout/ tagout. An example would be unplugging the cord of a power hand tool.

However, in most cases, detailed procedures must be written and implemented. At a minimum, they should include, but not be limited to, the following elements:

- Detailed list of the specific equipment to be locked and/or tagged out.
- Procedural steps to shutdown, isolate, secure, and safely restart the equipment.

- Individual responsibilities for locking out, clearing the area, and restarting the equipment.
- Verification of the effectiveness of the locks, tags, and any other energy control devices.
- Employee notification before lockout/ tagout devices are applied and after they are removed.

A sample lockout/tagout procedure is included on the reverse side of the lockout/tagout checklist.

When using contractors to perform work involving equipment lockout/tagout, CBS (as the host employer) must exchange procedural information with the contractor to minimize the potential for miscommunication.

The standard also requires that employees receive initial and periodic training relative to their role in the lockout/tagout program and mandates that periodic inspections be conducted to maintain or enhance the energy control program. Training and inspection records must be maintained to certify compliance with the standard.

Guidelines for Establishing a Lockout/Tagout Procedure

Each studio, production facility, transmitter site, office, construction property, etc. must establish written procedures. The written procedures must identify the information that the authorized employee must know to control hazardous energy during servicing or maintenance. These procedures must include the following steps:

Preparing for shutdown:

- Notify the affected employees who work on the machinery and/or equipment that it is being locked and tagged out. (It is important to also notify remote locations, such as the studio, that may be affected by the lockout/tagout of equipment.)
- The lockout/tagout procedure should only be performed by authorized employees – those who have been trained in the lockout/tagout procedures.

Shutting down the machinery and/or equipment:

- The machinery and/or equipment should be turned off in the normal fashion.
- In instances where the power is reduced and not completely turned off, such as during a phaser adjustment, a limit switch or an adjustment knob should be used to set the energy to the lowest level.
- Safely release all potentially hazardous stored or residual energy from capacitors, springs, steam, hydraulic systems, pneumatic systems, etc.
- Activate the energy-isolating device on the machinery or equipment.

Applying the lockout/tagout device to the energy-isolating device(s):

- Determine if the energy-isolating device being used is capable of being locked out. If the energy-isolating device is lockable, the employer must use locks, unless it can be demonstrated that the use of tags would provide protection at least as effective as locks and would assure "full employee protection." (When equipment is upgraded or replaced, the energy-isolating devices must be lockable.)
- In the rare instance where it can't be locked out, tagout must be used. Tags are warning devices affixed to energy-isolating devices and do not provide the physical restraint of a lock.
- Whichever lockout or tagout devices are used, they must be singularly identified; must be the only devices used for controlling hazardous

energy; and must meet the following requirements:

- Durability – lockout and tagout devices must be able to withstand the environment to which they are exposed for the extent of their expected exposure.
- Standardized – both lockout and tagout devices must be standardized according to color, shape, or size. Tagout devices must also be standardized according to print and format.
- Substantial – lockout and tagout devices must be substantial enough to minimize early or accidental removal. Locks must be substantial enough to prevent removal except by excessive force or special tools, such as bolt cutters or other metal cutting tools.
- Identifiable – locks and tags must clearly identify the employee who applied them. Tags also must warn against hazardous conditions if the machine or equipment is energized and must include a legend such as the following: ***DO NOT START – DO NOT OPEN – DO NOT CLOSE – DO NOT ENERGIZE – DO NOT OPERATE.***

- Standard locks and tags can be purchased for many types of equipment. In other instances, it may be necessary to have a device designed by the manufacturer or an engineer familiar with the operation of the system.
- Lockout/tagout the machinery and/or equipment with the appropriate device.

Verifying the isolation of the machinery and/or equipment prior to the start of servicing and/or maintenance work:

- Verify the isolation of the machinery and/or equipment prior to the start of servicing and/or maintenance work by trying to start or move the machinery and/or equipment in the normal fashion. If the machinery and/or equipment can't be activated, the lockout/tagout procedure has been successfully completed.
- Additionally, verify that all power sources have been neutralized by using an RF or electrical test meter, discharging the capacitors, bleeding the fluid line, etc.

After the servicing and/or maintenance work has been completed, the steps listed below should be followed to restore the machinery and/or equipment to service:

- Give the all-clear signal indication.
- Notify the affected employees who work on the equipment being re-energized.
- Check the area for equipment and tools that may have been left behind.
- Notify all employees in the area where re-energizing is being initiated and ascertain they are safely positioned or removed to a safe area.
- Ensure that machinery and/or equipment components are operationally intact and the controls in the neutral position.
- Ensure that the lockout/tagout devices are removed from each energy-isolating device by the employee who applied it.
- Re-energize the machinery and/or equipment.
- Notify employees that the maintenance and/or repairs are complete and the equipment can be safely restarted.

Training

The employer must provide effective initial training and retraining as necessary and must certify that such training has been given to all employees

covered by the standard. The certification must contain each employee's name and date of training.

The training should include the following:

- Recognition of applicable hazardous energy sources.
- Purpose and use of the energy control procedures.
- Procedures used to lockout/tagout each machine or piece of equipment.
- Consequences of unauthorized re-energizing of equipment.

When using tagout, the employer must provide specific training on the limitation of tags, including:

- Tags are warning devices.
- Tags are not to be removed except by the person who applied them.
- Tags must be legible and able to withstand the environmental conditions in the workplace.

For the purposes of these guidelines, the two types of employees covered are:

- Authorized employees – maintenance personnel, service personnel, transmitter engineers, technicians, etc. who have the responsibility for implementing the energy control procedures and performing the servicing and/or maintenance.
- Affected employees – the operators of the machinery and/or equipment.

Retraining must be provided, as required, whenever there is a change in job assignments; a change in machinery, equipment, or processes that present a new hazard; a change in energy control procedures; or if a near-miss incident has occurred. It should also be provided for individuals who display, through comments or actions, that they are not clear as to the lockout/tagout procedures.

In addition to our own employee training records, it is also necessary to obtain and keep the records for contract employees verifying that they have received training from their employer.

Inspection of Lockout/Tagout Procedures

An annual inspection of each procedure, when usage is at least once per year, must be performed to assure that the energy control procedures continue to be implemented properly and that the employees are familiar with their responsibilities under those procedures. It is necessary, for compliance purposes, to maintain a record of each lockout/tagout project that has been performed and to annually review these files.

An authorized employee, other than the one(s) using the energy control procedure, must perform the periodic inspections.

Inspection records must be maintained. It is necessary to keep only the most current record.

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OSHA has estimated that compliance with the lockout/tagout standard will prevent approximately 122 fatalities; 28,400 lost workday injuries; and 32,000 non-lost workday injuries each year.

Additionally, please review the Lockout/Tagout Procedures on performing de-energizing and lockout/tagout of equipment.

The Environmental Affairs organization can provide additional information and guidance on implementing a lockout/tagout program at your location. Please call Mark Perriello, 412-642-5055, for details.

Lockout/Tagout – Checklist

Regulatory Requirements

* Develop energy control procedures for electrical and mechanical sources.
* Document employee training.
* Conduct periodic reviews of servicing and/or maintenance procedures.
* Develop lockout/tagout, start-up, and re-energizing procedures.

Guidelines for Establishing a Lockout/Tagout Procedure

* **Prepare for shutdown:**
  -- Notify affected employees.
  -- Procedure must be performed by authorized employees.
* **Shutdown the machinery and/or equipment:**
  -- Turn off machinery and/or equipment in normal fashion.
  -- Safely release all potentially hazardous stored or residual energy.
  -- Activate the energy-isolating device.
* **Apply the lockout/tagout device to the energy-isolating device:**
  -- Determine if the energy-isolating device is capable of being locked out. If not, tagout can be used.
  -- The lock or tag must clearly identify the individual who applied it.
  -- In some instances, it may be necessary to have a lockout device specifically designed for the machinery and/or equipment.
* **Verify the isolation of the machinery and/or equipment:**
  -- If the machinery and/or equipment can't be started in the normal fashion, the lockout/tagout has been successfully completed.
  -- Verify that all power sources have been neutralized.
* **After the servicing and maintenance has been completed:**
  -- Notify the affected employees.
  -- Check for equipment and tools that may have been left behind.
  -- Ensure all employees are safely positioned when re-energizing.
  -- Ensure that machinery and/or equipment components are intact and the controls in the neutral/off position.
  -- The lockout/tagout devices must be removed by the individuals who applied them.
  -- Re-energize the machinery and/or equipment.
  -- Notify employees that the servicing and/or repairs are complete and the equipment can be restarted.

Training

* Must be given to all authorized and affected employees.
* Records must contain the employee's name and date of training.
* Retraining must be provided when appropriate.

Inspection

* Annual inspection must be performed.
* The most current inspection record must be maintained on file.

Sample Lockout/Tagout Procedure for an Antenna Unit

Controlling: Circuit breaker for antenna and motor; natural gas for de-icer.
Location: Transmitter site, control box beneath antenna
Primary Energy Source: 220 VAC
Secondary Energy Source: Natural gas

Shutdown and Lockout Procedure

1. Disconnect the circuit breaker by opening the switch and installing the locking device, cover, hasp, lock, and tag.
2. Verify the voltage is isolated from the equipment by moving the control switch or push button in the transmitter building to the ON position and observing that the power is neutralized to the motor.
3. Additionally, verify voltage to the equipment has been isolated by testing the voltage across the main breaker and the voltage is at a zero energy state.
4. Close gas valve at main line, place lockable cover with hasp, lock and tag.
5. If necessary, disconnect gas line and bleed off excess gas to safe area.
6. Perform maintenance or service activities as planned.

Restoring Equipment to Service

1. Inspect the equipment and ensure that the equipment components are operationally intact.
2. Observe the work area to ensure that all employees have been safely positioned or removed from the area.
3. Verify the controls are in a neutral or OFF position.
4. Reconnect gas line, if appropriate, and remove tag, lock, and cover with hasp.
5. Turn gas valve on and pressurize gas line. Check for leaks.
6. Remove the electric lockout device from the breaker and energize the unit to ensure it is operational.
7. If not operational, follow the shutdown procedures before additional work is performed.
8. Notify affected employees that the servicing or maintenance is completed and the equipment is ready for use.