Control of Hazardous Energy (Lockout/Tagout)

Amputations SEP Training
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NCDOL
N.C. Department of Labor
Occupational Safety & Health Division
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Objectives

- Develop a strong & working knowledge the LOTO standard (1910.147) and the documentation needed to support a citation.
- Become familiar with the Federal OSHA LOTO CPL and understand how it can be used to support possible citations.
- Discuss several accident case studies including those that involve maintenance employees and others where machine operators are involved.

OSHA LOTO CPL

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This presentation was created by the N.C. Department of Labor for safety and health training.

OSHA LOTO CPL

This directive (manual) establishes OSHA's enforcement policy for its standards addressing the control of hazardous energy. It instructs OSHA enforcement personnel on both the agency's interpretations of those standards, and on the procedures for enforcing them. The application of this instruction will further OSHA's goal of uniform enforcement of these standards. However, OSHA personnel should exercise professional judgment consistent with their authority as appropriate when particular circumstances necessitate a deviation from the guidance provided in the instruction in order to effectuate the purposes of the Occupational Safety and Health Act (OSH Act), to utilize resources to effectively administer the OSH Act, or to ensure CSHO safety.

CPL 02-00-147, Abstract-3

If you don't learn anything else….

The applicability of the standard (§1910.147 versus Subpart O standards) directly relates to the type of work being performed (servicing and/or maintenance versus normal production operations) and not to the means of abatement (LOTO versus safeguarding). For example, cleaning the rollers of an unguarded press, where the employee is exposed to in-going nip point hazards, is a LOTO standard violation and not a machine guarding violation because cleaning is a servicing activity. See §1910.147(a)(2)(ii)(B). However, compliance officers can not cite an employer for LOTO violations when effective machine guarding techniques are used to eliminate the hazardous (mechanical) energy employee exposures.

CPL 02-00-147, page 3-7

Lockout/Tagout

1910.147

- Technically known as the **Control of Hazardous Energy**
  - *Control of unexpected energization or start-up of machines or equipment, or release of stored energy that could cause injury to employees*

Scope – Important Points

- This standard protects employees from *caught-in* or *struck-by* hazards associated with the unexpected start-up of machinery during servicing and maintenance activities.

- It generally does NOT apply to electricians working on the wiring of machinery or the building. That is covered under Subpart S of 29 CFR 1910.

- As a result, you should not have an injury of "electrocution" for any 1910.147 citation.

Subpart S – Electrical Work Practices

- 1910.333(a)(1) "Deenergized parts." Live parts to which an employee may be exposed shall be deenergized before the employee works on or near them, unless the employer can demonstrate that deenergizing introduces additional or increased hazards or is infeasible due to equipment design or operational limitations. Live parts that operate at less than 50 volts to ground need not be deenergized if there will be no increased exposure to electrical burns or to explosion due to electric arcs.

Subpart S – Electrical Work Practices

- 1910.333(b)(2) "Lockout and Tagging." While any employee is exposed to contact with parts of fixed electric equipment or circuits which have been deenergized, the circuits energizing the parts shall be locked out or tagged or both in accordance with the requirements of this paragraph. The requirements shall be followed in the order in which they are presented (i.e., paragraph (b)(2)(i) first, then paragraph (b)(2)(ii), etc.).
  - Note 1: As used in this section, fixed equipment refers to equipment fastened in place or connected by permanent wiring methods.
  - **Note 2: Lockout and tagging procedures that comply with paragraphs (c) through (f) of 1910.147 will also be deemed to comply with paragraph (b)(2) of this section provided that**:
  - [1] The procedures address the electrical safety hazards covered by this Subpart; and
  - [2] The procedures also incorporate the requirements of paragraphs (b)(2)(iii)(D) and (b)(2)(iv)(B) of this section.

Subpart S – Electrical Work Practices

- 1910.333(b)(2)(i) "Procedures." The employer shall maintain a written copy of the procedures outlined in paragraph (b)(2) and shall make it available for inspection by employees and by the Assistant Secretary of Labor and his or her authorized representatives.

- Bottom Line – Exposures to electrical current need to be addressed under Subpart S and not 1910.147.

Scope of 1910.147

1910.147(a)(1)

- Covers the ***servicing and/or maintenance*** of machines or equipment where the unexpected start-up or release of stored energy could cause injury.
  - *Servicing and/or maintenance*. Workplace activities such as constructing, installing, setting up, adjusting, inspecting, modifying, and maintaining and/or servicing machines or equipment. These activities include **lubrication**, **cleaning or unjamming of machines** or equipment and making adjustments or tool changes, where the employee may be exposed to the *unexpected* energization or startup of the equipment or release of hazardous energy.

Scope – 1910.147

1910.147(a)(1)

- Does **not** cover
  - *Construction, agriculture, maritime*
  - *Installations under exclusive control of the electric utilities for power generation, transmission and distribution*
  - *Exposure to electrical hazards from work on, near, or with conductors or equipment in electric-utilization installations*
  - *Oil and gas drilling and servicing*

Application

1910.147(a)(2)

- Does **not** cover:
  - *Work on cord and plug connected equipment where plug is under exclusive control of employee performing servicing/maintenance*
  - *Hot tap operations, under special conditions*
  - ***Normal production operations***

CPL Tidbits on Scope/Application

The D.C. Court of Appeals upheld the Secretary's interpretation of the "cord-and-plug" exemption to OSHA's lockout/tagout standard. Because employees serviced cord-and-plug connected equipment that was not unplugged during the servicing, "the Commission did not err in finding the exemption inapplicable." The Secretary interprets the exemption as applying to work on cord-and-plug equipment only if the equipment is unplugged and the plug is in the exclusive control of the servicing employee. See *Tops Markets, Inc.*, (OSHRC Docket No. 94-2527, 1997) for background information.

CPL 02-00-147, page 3-17

CPL Tidbits on Scope/Application

In promulgating the standard, it was OSHA's intent to protect employees effectively from all forms of hazardous energy by isolating machines from their respective energy sources during servicing and/or maintenance and providing individual authorized employees with control over energy isolation devices, and this intent is expressed in the *Scope, application, and purpose* paragraph, §1910.147(a), as well as throughout the preamble to the Final Rule. However, the Occupational Safety and Health Review Commission (OSHRC) and United States Court of Appeals for the Sixth Circuit have held that the standard did not apply in a situation where warning devices allowed adequate time for employees to move out of the danger zone and avoid employee injury. See *General Motors Corp., Delco Chassis Div., 17 BNA OSHC 1217 (Nos. 91-2973, 91-3116, 91-3117, 1995), aff'd., 89 F.3d 313 (6th Cir. 1996).*

CPL 02-00-147, page 3-3

CPL Tidbits on Scope/Application

GMC Summary: The OSHRC found that to service or maintain the three cited machines, an employee had to pass through electronically interlocked gates that immediately deactivated the machines when opened. The Commission further found that once deactivated, an eight to twelve step process had to be followed to restart each of the machines and that, either by audible or visual signals or the presence of company employees in the immediate work area, this multi-step process would have alerted employees servicing the machines that they were about to start-up. Given the advance notice provided by the start-up warning sequences, the OSHRC reasoned that the standard did not apply because the energization would not be *unexpected*. The Commission held that the Secretary must establish that a cited machine or piece of equipment presents the hazard of unexpected energization or start-up. The United States Court of Appeals for the Sixth Circuit affirmed the Commission's holding.

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CPL Tidbits on Scope/Application

In addition, the *GMC Delco* decisions do not apply when an employer fails to turn the equipment off in the first place, and then claims that activation could not be unexpected because the employees knew the equipment was still operating. For example, in *Secretary v. Burkes Mechanical*, 21 BNA OSHC 2136, 2139 n.4 (Docket No. 04-0475, 2007), the Commission did not accept an employer's contention that the standard did not apply because the employees knew that the conveyor they were servicing was running. It explained that the standard specifically applies to servicing during normal production operations, and allowing the equipment to operate during servicing presented exactly the type of hazard the standard is intended to address. See Section II.B of this Chapter.

CPL 02-00-147, page 3-4

Application

1910.147(a)(2)

- Servicing and/or maintenance which takes place during **normal production operations** is covered by 1910.147 only if:
  - *Employee is required to remove or bypass a guard or other safety device; **or***
  - *Employee is required to place any part of his/her body into the point of operation or where an associated danger zone exists during a machine operation.*

What does the CPL say about this?

If a servicing or maintenance activity takes place as part of the normal production operation, the employee performing the servicing or maintenance may be subjected to hazards not normally associated with the traditional production process. Although the machine guarding provisions in Subpart O of 29 CFR §1910 cover normal production operations, employees engaged in servicing or maintenance during normal production operations must follow LOTO program requirements if they:

1. Remove or bypass machine guards or other safety devices;
2. Place any part of their bodies in or near a machine's point of operation; or
3. Place any part of their bodies in a danger zone associated with machine operations. See §1910.147(a)(2)(ii)(A) and (B).

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Production or Servicing?

Furthermore, there are some tasks, such as machine or equipment inspection, which may either constitute "servicing and/or maintenance" or "normal production operation" activities depending upon the specific circumstances of the work tasks. The purpose or function of the activity determines which standard applies. If the inspection activity is conducted to determine product quality or it is functionally related to the product, then it is a normal production operation. Conversely, if the inspection is performed to troubleshoot a mechanical problem or determine the adequacy of an equipment or machine repair, then the inspection is a "servicing and/or maintenance" activity that is addressed by the LOTO standard.

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Application

1910.147(a)(2)

- **Exception**
  - *Minor tool changes and adjustments, **and** other minor servicing activities, which take place during normal production operations, are **not covered** if they are:*
    - Routine,
    - Repetitive, ***and***
    - Integral to the use of the equipment for production

…provided that the work is performed using alternative measures which provide effective protection.

Minor Servicing Exemption

In short, the general rule is that *servicing and/or maintenance* must be performed under LOTO requirements. However, the LOTO standard is not intended to cover certain minor servicing activities, which are necessary to carry out the production process, provided that all of the criteria detailed in the exception are met. Nonetheless, the exclusion from LOTO does not mean that the employer can avoid providing employee protection even though employees carry out these minor servicing tasks with the machine or equipment energized. Rather, in order to take advantage of the limited exception, an employer must provide effective alternative protection in lieu of LOTO.

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Minor Servicing Exemption

The first set of criteria for determining the application of the minor servicing exception is whether the activity must take place during, and is inherent to, normal production operations. These servicing activities must be necessary to allow production to proceed without interruption. Additionally, the minor servicing activity must be:

A. Routine: The activity must be performed as part of a regular and prescribed course of procedure and be performed in accordance with established practices.

B. Repetitive: The activity must be repeated regularly as part of the production process or cycle.

C. Integral: The activity must be inherent to the production process.

The employer must also demonstrate that the alternative measures provide effective protection from the hazardous energy. Most importantly, this exception applies only if each and every element of the exception is met.

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What are Alternative Measures?

Several alternative means for providing effective protection from the hazardous portion of machines and equipment are presented by the national consensus standard, ANSI B11.19-1990, which addresses performance criteria for the design, construction, care, and operation for machine tool safeguarding. The *Performance Criteria for Safeguarding*, ANSI B11.19-2003, consensus standard for machine tools, superseded the 1990 edition, and it also contains requirements for the design, construction, installation, operation, and maintenance of the safeguarding used to eliminate or control hazards to individuals associated with machine tools. Although these standards are not all-inclusive, they describe effective safeguarding alternatives for the protection of employees. Some of these described safeguards include:

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What are Alternative Measures?

A. Interlocked barrier guards,

B. Presence sensing devices, and

C. Various devices under the exclusive control of the employee.

Such guards or safety devices, when properly applied, may be used in clearing minor jams and performing other minor servicing functions, which occur during normal production operations and which meet the §1910.147(a)(2)(ii) exception criteria. During minor servicing, an employer is considered to have met the requirement for providing effective alternative protection by the use of special tools or guarding (safeguarding) techniques that effectively prevent employee exposure to hazardous energy.

CPL 02-00-147, page 3-28

Alternative Measures – Example #1

Some tool changes and adjustments, such as changing a mixing blade on a vertical mixer or a drill bit on a single-spindle drill press or a carbide cutting tool on a single-spindle automatic screw machine, are permitted to be performed without LOTO if the machine's electrical disconnects or control (e.g., on/off buttons or emergency stops) switches:

1. Are properly designed and applied in accordance with recognized and good engineering practice; and
2. Control all the hazardous energy and are placed in an *off* position; and
3. Are under the exclusive control of the employee performing the task.

NOTE: The use of control circuit devices does not, in all cases, protect employees from stored or residual energy hazards. Also, for purposes of this exception, control circuit devices may not provide alternative effective protection if any of the above criteria are not met or if injury experience exists confirming the procedure's inadequacies.

CPL 02-00-147, page 3-29

Alternative Measures – Example #2

Vertical and horizontal milling machine operators perform minor tool changes and minor adjustments (e.g., minor belt drive adjustments; moving the coolant hose assembly close to the point of operation) that are integral to the production process by pushing the machine's stop button (without disconnecting the power supply to the machine) and perform the task in the close proximity of the start button. All that is required to restart the machine is to push a guarded start button; however, an operator has exclusive control of this shut off control circuit because he could easily see another person approaching the control panel and prevent her from operating the control. In this scenario, milling machine operators who shut off the machine and exercise exclusive control over this control circuit would not need to implement LOTO. However, the minor servicing would be covered by the LOTO standard if the alternative work method becomes ineffective (i.e., there is no alternative employee protection) and exposes employees to machine hazards.

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Alternative Measures – Example #3

Blow mold machine operators perform minor un-jamming tasks, during normal production operations, at the machine's trimmer unit on a routine and repetitive basis to remove stuck plastic containers. This operator shuts the machines off with the control circuit switch (stop button) and she opens an interlocked plexi-glass barrier guard to gain access to the trimmer's point-of-operation area. The employer utilizes a guard system, designed by the manufacturer in accordance with recognized and generally accepted good engineering practices, that causes the mechanical interlock switch to break the electric circuit when the guard is moved for employee access purposes and shuts down the machine. Within the context of the minor servicing exception, the described and properly applied interlocked plexi-glass guard system, together with the operator's exclusive control of the control circuit devices, constitute *alternative measures which constitute effective protection*.

Alternative Measures - IMPORTANT

Alternatively, LOTO would be required if the stuck part or other condition creates a situation where each and every element of the minor servicing exception cannot be met. For example, a mold may open too soon or a stuck plastic part may melt or the part may become stuck such that LOTO is required because "other-than-minor" cleaning (e.g., prying, pulling, scrapping, and/or chipping) or even machine component (e.g., die) disassembly, must be performed. These types of activities are not minor in nature.

CPL 02-00-147, page 3-31

Summary of Applicability

As a general principle, the LOTO standard does not apply to servicing and maintenance activities when employees are not exposed to hazardous energy. Therefore, employees can be protected from these severe workplace injuries and fatality incidents by:

1. LOTO – i.e., 29 CFR §1910.147;
2. Complying with the minor servicing exception to the LOTO standard – i.e., the note contained in §1910.147(a)(2)(ii);
3. Utilizing the cord and plug connected equipment or hot tap exemptions – i.e., §§ 1910.147(a)(2)(iii)(A) and (a)(2)(iii)(B);
4. Effective machine guarding, in compliance with Subpart O, that eliminates or prevents employee exposure from the hazardous energy associated with the machines or equipment;
5. Final actions granting LOTO standard variances (e.g., energy isolating device equivalency) in accordance with the §1905 rules; or
6. Other applicable portions of Part 1910 (e.g., guarding and LOTO contained in Subpart R special industries standards; electrical lockout and tagging requirements contained in §1910.333) that prevent employee exposure to hazardous energy.

Definitions

1910.147(b)

- **Authorized employee**
  - *An employee who locks out or tags out machines or equipment to perform servicing or maintenance on that machine or equipment*
  - *Lockout or tagout is used by these employees for their own protection*

Definitions

1910.147(b)

- **Affected employee**
  - *An employee who performs the duties of his or her job on equipment or in an area in which the energy control procedure is implemented and servicing or maintenance operations are performed*

Other Employees

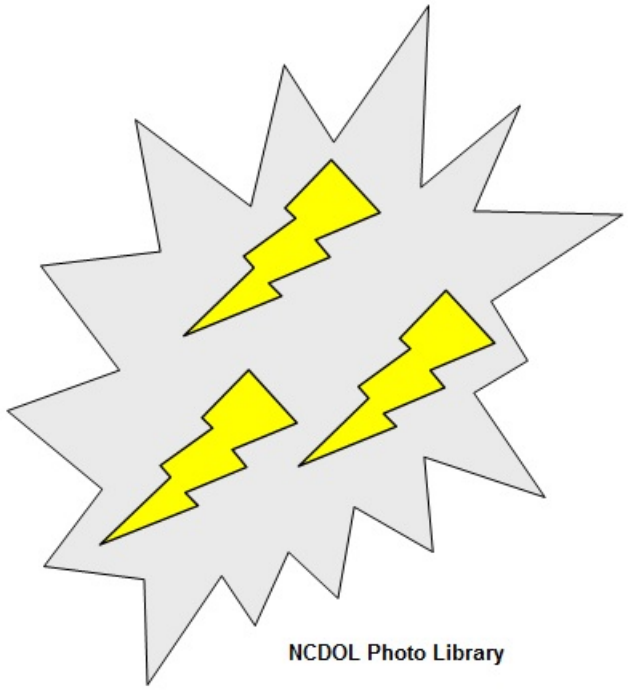
1910.147(c)(7)

- **Other employees**
  - *Other employees whose work operations are, or may be, in an area where energy control procedures may be utilized*

Definitions

1910.147(b)

- **Energy source**
  - *Mechanical*
  - *Hydraulic*
  - *Pneumatic*
  - *Electrical*
  - *Kinetic*
  - *Gravity*



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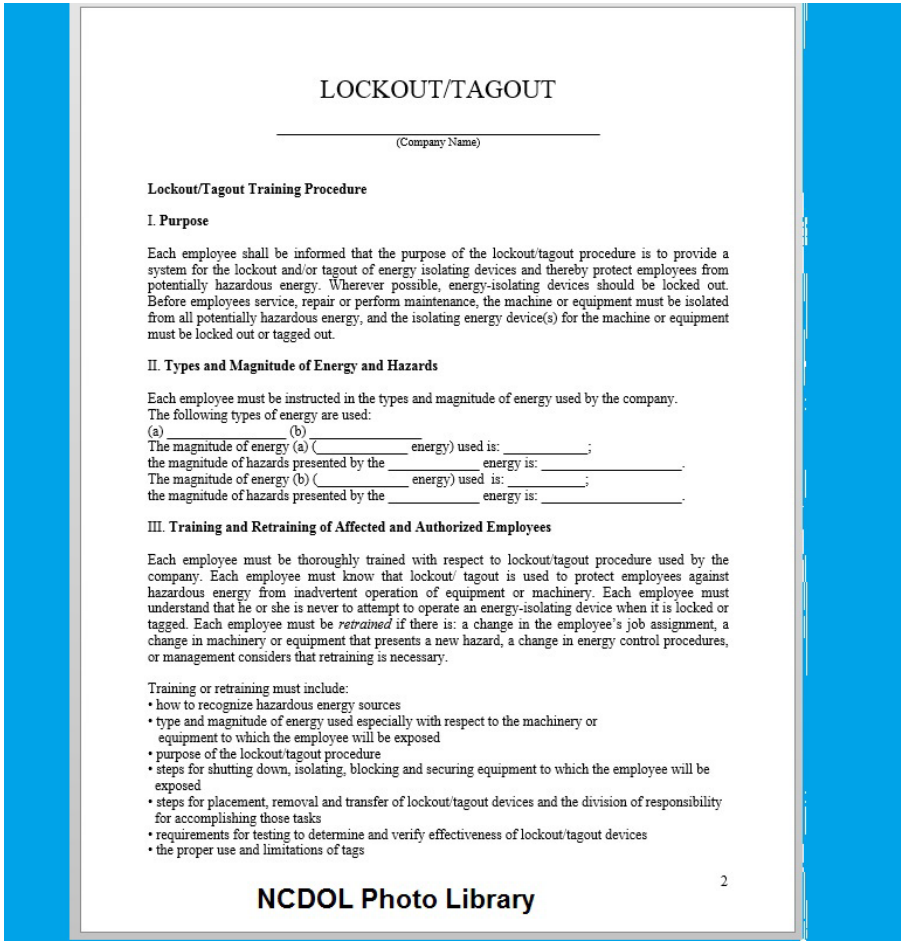
Energy Control Program

1910.147(c)(1)

- The employer shall establish a program consisting of:
  - *Energy control procedures*
  - *Employee training*
  - *Periodic inspections*



LOCKOUT/TAGOUT

_____
(Company Name)

Lockout/Tagout Training Procedure

I. **Purpose**

Each employee shall be informed that the purpose of the lockout/tagout procedure is to provide a system for the lockout and/or tagout of energy isolating devices and thereby protect employees from potentially hazardous energy. Wherever possible, energy-isolating devices should be locked out. Before employees service, repair or perform maintenance, the machine or equipment must be isolated from all potentially hazardous energy, and the isolating energy device(s) for the machine or equipment must be locked out or tagged out.

II. **Types and Magnitude of Energy and Hazards**

Each employee must be instructed in the types and magnitude of energy used by the company.
The following types of energy are used:
(a) _____ (b) _____
The magnitude of energy (a) (_____ energy) used is: _____;
the magnitude of hazards presented by the _____ energy is: _____.
The magnitude of energy (b) (_____ energy) used is: _____;
the magnitude of hazards presented by the _____ energy is: _____.

III. **Training and Retraining of Affected and Authorized Employees**

Each employee must be thoroughly trained with respect to lockout/tagout procedure used by the company. Each employee must know that lockout/ tagout is used to protect employees against hazardous energy from inadvertent operation of equipment or machinery. Each employee must understand that he or she is never to attempt to operate an energy-isolating device when it is locked or tagged. Each employee must be *retrained* if there is: a change in the employee's job assignment, a change in machinery or equipment that presents a new hazard, a change in energy control procedures, or management considers that retraining is necessary.

Training or retraining must include:
- how to recognize hazardous energy sources
- type and magnitude of energy used especially with respect to the machinery or equipment to which the employee will be exposed
- purpose of the lockout/tagout procedure
- steps for shutting down, isolating, blocking and securing equipment to which the employee will be exposed
- steps for placement, removal and transfer of lockout/tagout devices and the division of responsibility for accomplishing those tasks
- requirements for testing to determine and verify effectiveness of lockout/tagout devices
- the proper use and limitations of tags

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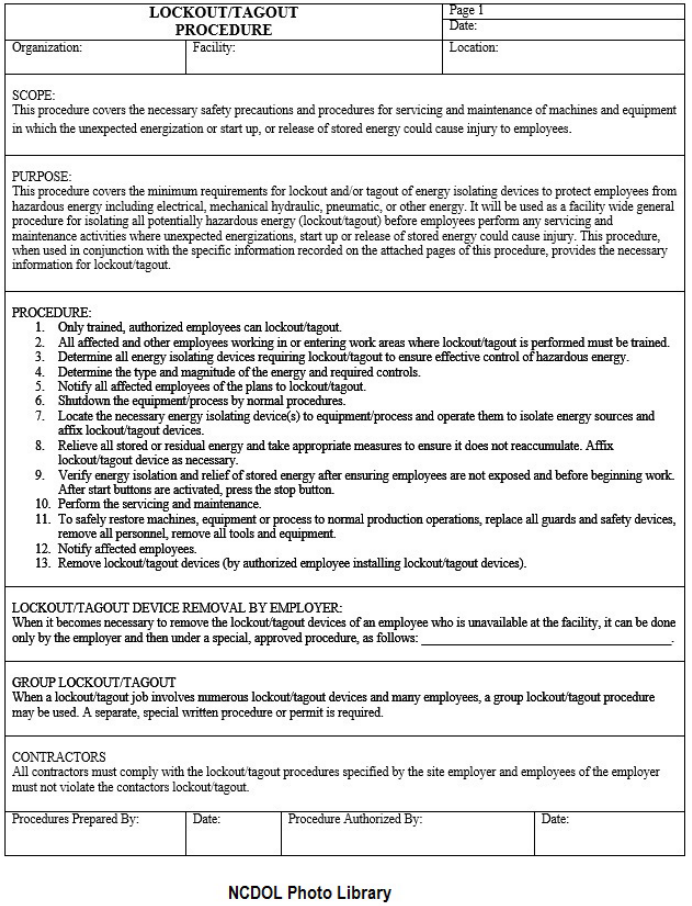
Energy Control Program

- Important point – there is no requirement for a written LOTO "program."
- Many employers have a generic written LOTO procedure that doesn't comply with the requirements of 1910.147(c)(4)(ii).
- There are requirements for written LOTO *components*, including:
  - Documented energy control procedures (if multiple energy sources or stored energy)
  - Certification of periodic inspections
  - Certification of employee training

Energy Control Procedure

1910.147(c)(4)

- **Procedures**
  - Shall be **developed, documented and utilized** for the control of potentially hazardous energy
  - Shall clearly and specifically outline techniques to be utilized to control hazardous energy



LOCKOUT/TAGOUT PROCEDURE		Page 1 Date:
Organization:	Facility:	Location:

SCOPE:
This procedure covers the necessary safety precautions and procedures for servicing and maintenance of machines and equipment in which the unexpected energization or start up, or release of stored energy could cause injury to employees.

PURPOSE:
This procedure covers the minimum requirements for lockout and/or tagout of energy isolating devices to protect employees from hazardous energy including electrical, mechanical hydraulic, pneumatic, or other energy. It will be used as a facility wide general procedure for isolating all potentially hazardous energy (lockout/tagout) before employees perform any servicing and maintenance activities where unexpected energizations, start up or release of stored energy could cause injury. This procedure, when used in conjunction with the specific information recorded on the attached pages of this procedure, provides the necessary information for lockout/tagout.

PROCEDURE:
1. Only trained, authorized employees can lockout/tagout.
2. All affected and other employees working in or entering work areas where lockout/tagout is performed must be trained.
3. Determine all energy isolating devices requiring lockout/tagout to ensure effective control of hazardous energy.
4. Determine the type and magnitude of the energy and required controls.
5. Notify all affected employees of the plans to lockout/tagout.
6. Shutdown the equipment/process by normal procedures.
7. Locate the necessary energy isolating device(s) to equipment/process and operate them to isolate energy sources and affix lockout/tagout devices.
8. Relieve all stored or residual energy and take appropriate measures to ensure it does not reaccumulate. Affix lockout/tagout device as necessary.
9. Verify energy isolation and relief of stored energy after ensuring employees are not exposed and before beginning work. After start buttons are activated, press the stop button.
10. Perform the servicing and maintenance.
11. To safely restore machines, equipment or process to normal production operations, replace all guards and safety devices, remove all personnel, remove all tools and equipment.
12. Notify affected employees.
13. Remove lockout/tagout devices (by authorized employee installing lockout/tagout devices).

LOCKOUT/TAGOUT DEVICE REMOVAL BY EMPLOYER:
When it becomes necessary to remove the lockout/tagout devices of an employee who is unavailable at the facility, it can be done only by the employer and then under a special, approved procedure, as follows: _____.

GROUP LOCKOUT/TAGOUT
When a lockout/tagout job involves numerous lockout/tagout devices and many employees, a group lockout/tagout procedure may be used. A separate, special written procedure or permit is required.

CONTRACTORS
All contractors must comply with the lockout/tagout procedures specified by the site employer and employees of the employer must not violate the contactors lockout/tagout.

Procedures Prepared By:	Date:	Procedure Authorized By:	Date:

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Energy Control Procedure

1910.147(c)(4)

- **Energy control (LOTO) procedure**
  - *Statement of intended use of procedure*
  - *Steps for shutting down, isolating, blocking and securing machines or equipment to control hazardous energy*
  - *Steps for the placement, removal and transfer of lockout devices or tagout devices and the responsibility for them,* ***and***
  - *Requirements for testing machine/equipment to determine and verify effectiveness of LOTO devices and other energy control measures*

Control Sequence

1910.147(d)

- Application of control
  1. *Preparation for shutdown*
  2. *Machine or equipment shutdown*
  3. *Machine or equipment isolation*
  4. *LOTO device application*
  5. *Release of stored energy*
  6. *Verification of isolation*

Written Procedure Exception 1910.147(c)(4)

- When conducting servicing and/or maintenance on machinery or equipment, an energy control procedure **must be developed and utilized**, but doesn't need to be *documented* if all of the following exceptions apply:
  - **Machine/equipment has no potential for stored or residual energy after shut down**
  - **Machine/equipment has a single energy source (readily identified and isolated)**
  - The isolation and locking out of energy source will completely de-energize/deactivate the machine/equipment
  - Machine/equipment is isolated from that energy source and locked out during servicing or maintenance

Written Procedure Exception 1910.147(c)(4)

- Lockout device is under the exclusive control of the authorized employee performing the servicing or maintenance
- Servicing/maintenance does not create hazards for other employees; *and*
- Employer has had no accidents involving the unexpected activation/re-energization of the machine/equipment during servicing/maintenance

Periodic Inspection

1910.147(c)(6)

- Conducted at least annually to ensure procedure and requirements are followed
- Performed by authorized employee other than the one(s) using the procedure
- Designed to correct identified deficiencies or inadequacies
- Must review each **authorized** employee's responsibilities under the energy control procedure

Periodic Inspection

These periodic inspections must contain at least two components: 1) an inspection of each energy control procedure, and 2) a review of each employee's responsibilities under the energy control procedure being inspected. Each energy control procedure required by §1910.147(c)(4) must be separately inspected to ensure that the energy control procedure is adequate and is being properly implemented by the authorized employee in accordance with the LOTO standard.

NOTE: Energy control procedures that are not required to be documented, per the §1910.147(c)(4)(i) documentation exception, still need to be inspected and reviewed to ensure that they are adequate and being properly utilized.

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Periodic Inspection

At a minimum, these inspections must include a demonstration of the procedures and must be performed while the authorized employees perform servicing and/or maintenance activities on machines or equipment. The inspections may be accomplished through random audits, plant safety tours, or planned visual observations. The inspector, who must be an authorized employee other than the one(s) utilizing the energy control procedure being inspected, must observe the implementation of the energy control procedure for the servicing and/or maintenance activities being evaluated and talk with employees implementing the procedure to determine that all the requirements of the LOTO standard are understood and being followed by employees.

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Periodic Inspection

1910.147(c)(6)(i)

- The employer shall certify that the periodic inspections have been performed. The certification shall identify:

1. The machine or equipment on which the energy control procedure was being utilized;
2. The date of the inspection;
3. The employees included in the inspection; and
4. The person performing the inspection.

Training and Communication 1910.147(c)(7)

- Authorized employee
  - *Recognition of hazardous energy sources*
  - *Type and magnitude of energy in workplace*
  - *Methods and means for energy isolation and control*
- Affected employee
  - *Purpose and use of the energy control procedure*

Authorized Employee Training

Authorized employees are those responsible for implementing the energy control procedures (e.g., an employee who locks out or tags out machines) and/or performing the servicing or maintenance activities. These employees must have the knowledge and skills necessary for the safe application, use, and removal of energy isolating devices. For employers with a large number of procedures, each *authorized employee* must be able to safely perform the work required by any energy control procedure that he may be called upon to use, however rarely. Therefore, these employees need training in the applicable aspects of the procedure and its proper utilization, together with training in the:

A. Recognition and understanding of all applicable hazardous energy sources;

B. Type and magnitude of the hazardous energy sources associated with machinery or equipment on which they will perform servicing or maintenance; and

C. Energy control procedures, including the methods and means to isolate and control relevant energy sources.

Affected Employee Training

Affected employees are those employees (e.g., machine operators and material handling specialists) who operate or interact with machines that are serviced and maintained pursuant to energy control procedures, as well as those employees (e.g., general laborers) who are assigned to work in areas where energy control procedures are utilized to service or maintain machinery. In other words, employees who are assigned to areas where servicing or maintenance work is performed, but who do not implement energy control procedures or perform servicing and/or maintenance work need only be trained as *affected employees*. *Affected employees* must be able to:

Affected Employee Training

- Affected Employees must be able to:

A. Recognize LOTO devices immediately;

B. Recognize when the energy control procedure is being used;

C. Understand the purpose and use of the procedure; and, most importantly; and

D. Understand the importance of not tampering with lockout or tagout devices and not starting or using equipment that has been locked out or tagged out.

- This is the training that machine operators who do NOT conduct servicing & maintenance must receive. Your interviews with these employees should focus on these items.
- Please note that this is more than “LOTO Awareness” training.
- If the operators are unjamming equipment or doing other servicing and /or maintenance work, they must be trained as AUTHORIZED EMPLOYEES.

Training and Communication 1910.147(c)(7)

- **All other employees**
  - *Procedures for energy control*
  - *Prohibition of restarting or reenergizing machines that are locked or tagged out*

Testing/Positioning Machines 1910.147(f)

- When LOTO devices must temporarily be removed for testing/positioning:
  - *Clear machine or equipment of tools and materials*
  - *Remove employees from area*
  - *Remove lockout/tagout device*
  - *Energize and proceed with testing or positioning*
  - *Deenergize and reapply energy control measures*

Group Lockout/Tagout

1910.147(f)(3)

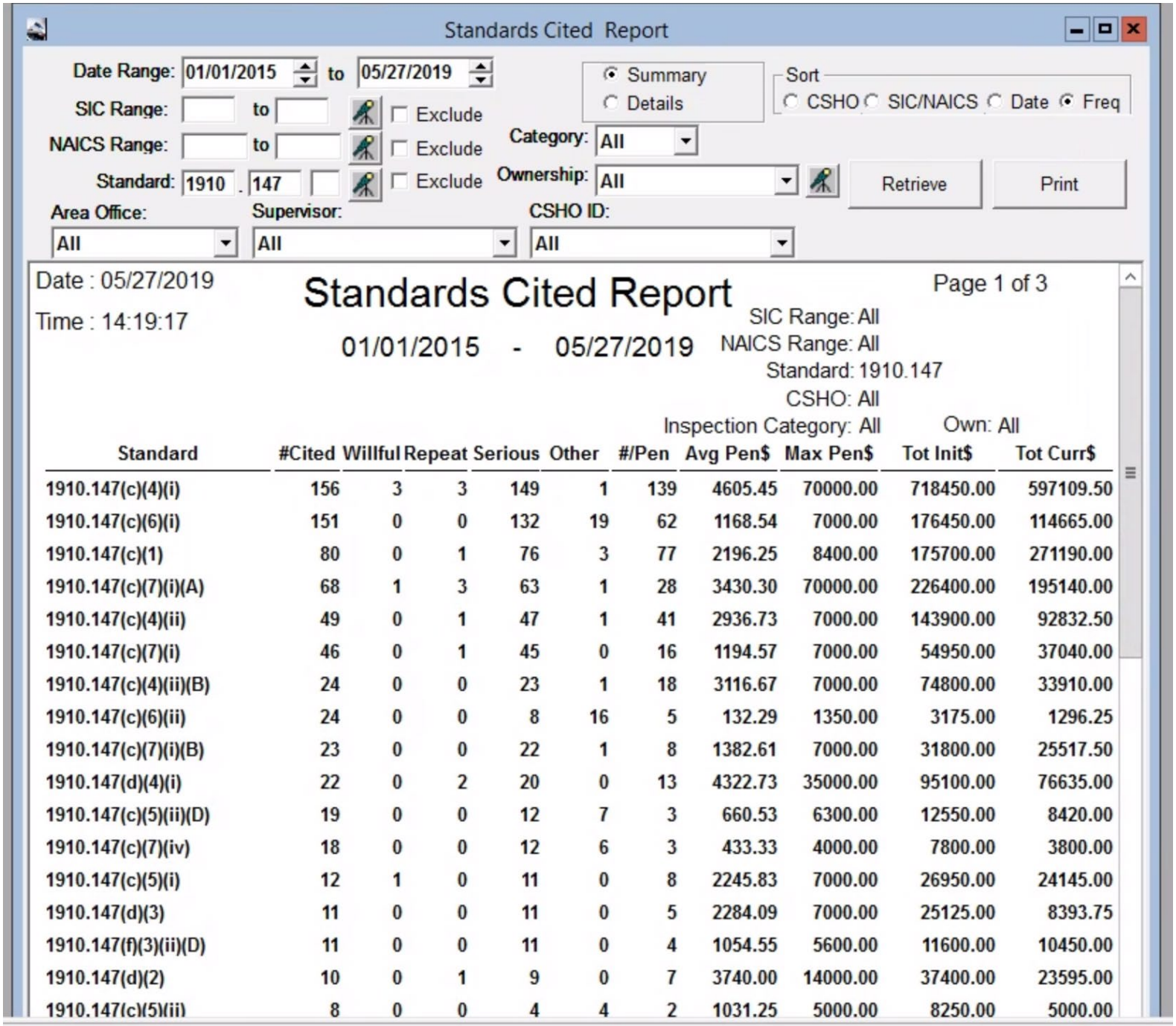
- When servicing and/or maintenance is performed by a group, they shall utilize a procedure which affords employee protection equivalent to a personal LOTO device

Group Lockout/Tagout

1910.147(f)(3)

- Primary responsibility is vested in an authorized employee
- Authorized employee must ascertain exposure status of group members
- If more than one crew is involved, a coordinator shall be designated
- Each authorized employee shall use a personal LOTO device and remove device when they stop working on machine/equipment

1910.147 Citations by Frequency (since 2015)



Standards Cited Report

Date Range: 01/01/2015 to 05/27/2019 | Summary / Details | Sort: CSHO / SIC/NAICS / Date / Freq

SIC Range: to Exclude | NAICS Range: to Exclude | Standard: 1910 . 147 Exclude | Category: All | Ownership: All | Retrieve | Print

Area Office: All | Supervisor: All | CSHO ID: All

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Standards Cited Report

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SIC Range: All
NAICS Range: All
Standard: 1910.147
CSHO: All
Inspection Category: All
Own: All

Standard	#Cited	Willful	Repeat	Serious	Other	#/Pen	Avg Pen$	Max Pen$	Tot Init$	Tot Curr$
1910.147(c)(4)(i)	156	3	3	149	1	139	4605.45	70000.00	718450.00	597109.50
1910.147(c)(6)(i)	151	0	0	132	19	62	1168.54	7000.00	176450.00	114665.00
1910.147(c)(1)	80	0	1	76	3	77	2196.25	8400.00	175700.00	271190.00
1910.147(c)(7)(i)(A)	68	1	3	63	1	28	3430.30	70000.00	226400.00	195140.00
1910.147(c)(4)(ii)	49	0	1	47	1	41	2936.73	7000.00	143900.00	92832.50
1910.147(c)(7)(i)	46	0	1	45	0	16	1194.57	7000.00	54950.00	37040.00
1910.147(c)(4)(ii)(B)	24	0	0	23	1	18	3116.67	7000.00	74800.00	33910.00
1910.147(c)(6)(ii)	24	0	0	8	16	5	132.29	1350.00	3175.00	1296.25
1910.147(c)(7)(i)(B)	23	0	0	22	1	8	1382.61	7000.00	31800.00	25517.50
1910.147(d)(4)(i)	22	0	2	20	0	13	4322.73	35000.00	95100.00	76635.00
1910.147(c)(5)(ii)(D)	19	0	0	12	7	3	660.53	6300.00	12550.00	8420.00
1910.147(c)(7)(iv)	18	0	0	12	6	3	433.33	4000.00	7800.00	3800.00
1910.147(c)(5)(i)	12	1	0	11	0	8	2245.83	7000.00	26950.00	24145.00
1910.147(d)(3)	11	0	0	11	0	5	2284.09	7000.00	25125.00	8393.75
1910.147(f)(3)(ii)(D)	11	0	0	11	0	4	1054.55	5600.00	11600.00	10450.00
1910.147(d)(2)	10	0	1	9	0	7	3740.00	14000.00	37400.00	23595.00
1910.147(c)(5)(ii)	8	0	0	4	4	2	1031.25	5000.00	8250.00	5000.00

Keeping it Simple…

- The LOTO standard is relatively complicated, but we typically only cite a few main issues:

1. Failure to develop, document, and/or utilize energy control procedures.
2. Incomplete energy control procedures.
3. Inadequate training of authorized or affected employees
4. Failure to conduct periodic inspections of the procedures and/or authorized employees.
5. Failure to use group lockout when there are multiple employees doing servicing & maintenance work.

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1910.147(c)(4)(ii)(B)	24	0	0	23	1	18	3116.67	7000.00	74800.00	33910.00

29 CFR 1910.147(c)(4)(i): Procedures were not developed, documented and utilized for the control of potentially hazardous energy when employees were engaged in the activities covered by this section:

1910.147(c)(4)(i) – Lack of ECP

- It's important to first determine which element(s) of this standard have been violated.

  1. Have energy control procedures been developed? Keep in mind, these procedures could be verbal.

  2. Have the procedures been documented in writing? Remember, if the machinery and the employer meets all the exceptions (e.g. single energy source, no stored energy, etc.), the procedures don't have to be documented.

  3. Are the procedures being utilized by employees during servicing and/or maintenance activities.

- Your AVD should outline the specific details – as well as the type of servicing and/or maintenance work that was occurring.

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29 CFR 1910.147(c)(4)(i): Procedures were not developed, documented and utilized for the control of potentially hazardous energy when employees were engaged in the activities covered by this section:

a) Facility – in the Finishing Department where **the employer did not develop and utilize machine specific energy control procedures** when employees perform servicing and/or maintenance activities on equipment having multiple sources of energy such as but not limited to, the tenter frame SR-1 machine. On or about November 20, 2018, **an operator was seriously injured while fixing a machine jam.**

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29 CFR 1910.147(c)(4)(i): Procedures were not developed, documented and utilized for the control of potentially hazardous energy when employees were engaged in the activities covered by this section:

b) Laminator Line 3, Horizontal Slitter - where energy control procedures to protect employees from exposure to the Miller Moore slitter 1 (serial number 96238162-004) or slitter 2 (serial number 96238162-003) while performing servicing and maintenance activities, including but not limited to, removing or **clearing a jam** caused by a material build up, **had been developed but were not utilized to clear material jams during production operations.**

Violation Section (B1) – Required Elements

- Evidence that must be documented for this citation (and all 1910.147 citations):
  1. How/why this standard (1910.147) applies. Exactly what servicing and/or maintenance activities were being conducted?
  2. If during normal production, explain how they had to remove a guard or reach into an associated danger zone.
  3. Explain how/why the minor servicing exemption does not apply. Is it routine and repetitive? Is the work conducting using alternative measures that provide effective protection?

Violation Section (B1) – Required Elements

- After establishing the standard applies, you need to document how the employer violated its requirements.
  - How/why we know procedures were not **developed**.
  - Were the procedures **documented** in writing? Be sure to explain how the machinery did not meet the exceptions (e.g. multiple energy sources), so the ECP must be in writing.
  - Explain how the procedures were not **utilized**. Be sure to discuss what employees said how they typically handle that servicing and/or maintenance activity.

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1910.147(c)(4)(ii)(B)	24	0	0	23	1	18	3116.67	7000.00	74800.00	33910.00

29 CFR 1910.147(c)(6)(i): The employer did not conduct a periodic inspection of the energy control procedure at least annually to ensure that the procedure and the requirement of this standard were being followed:

a) facility, routing department - where periodic inspections of the energy control procedures were not conducted for employees performing servicing and/or maintenance activities on equipment such as the C.R. Onsrud Single Table C.N.C. Machine that has multiple sources of energy, to include electrical, hydraulic, and mechanical.

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1910.147(c)(4)(ii)(B)	24	0	0	23	1	18	3116.67	7000.00	74800.00	33910.00

29 CFR 1910.147(c)(1): The employer did not establish a program consisting of energy control procedures, employee training and periodic inspections to ensure that before any employee performs any servicing or maintenance on a machine or equipment where the unexpected energizing, startup or release of stored energy could occur and cause injury, the machine or equipment was isolated from the energy source and rendered inoperative:

a) facility, where the employer did not implement a lockout/tagout program, including energy control procedures, employee training, and periodic inspections for employees performing servicing and/or maintenance on vertical balers.

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1910.147(c)(4)(ii)(B)	24	0	0	23	1	18	3116.67	7000.00	74800.00	33910.00

29 CFR 1910.147(c)(7)(i)(A): Authorized employee(s) did not receive training in the recognition of applicable hazardous energy sources, the type and magnitude of the energy available in the workplace, and the methods and means necessary for energy isolation and control:

a) facility, where employees who performed servicing and maintenance on food processing machines, a robotic palletizer and automated shrink wrapper, a case packer, and related equipment had not been trained on the specific procedures for controlling hazardous energy.

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1910.147(c)(4)(ii)(B)	24	0	0	23	1	18	3116.67	7000.00	74800.00	33910.00

29 CFR 1910.147(c)(4)(ii): Procedures did not 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, 29 CFR 1910.147(c)(4)(ii)(A), (c)(4)(ii)(B), (c)(4)(ii)(C) and (c)(4)(ii)(D):

a) within the facility, the employer did not implement lock and tag procedures that outlined specific procedural steps for shutting down, isolating, blocking and securing machines or equipment, placement of lockout devices and verifying the effectiveness of the lock and tag devices for equipment and machinery, such as but not limited to, conveyors, Model 752 packing machine and mixers, which operate at 480 volts.

Energy Control Procedure

1910.147(c)(4)

- **Energy control (LOTO) procedure**
  - *Statement of intended use of procedure*
  - *Steps for shutting down, isolating, blocking and securing machines or equipment to control hazardous energy*
  - *Steps for the placement, removal and transfer of lockout devices or tagout devices and the responsibility for them,* ***and***
  - *Requirements for testing machine/equipment to determine and verify effectiveness of LOTO devices and other energy control measures*

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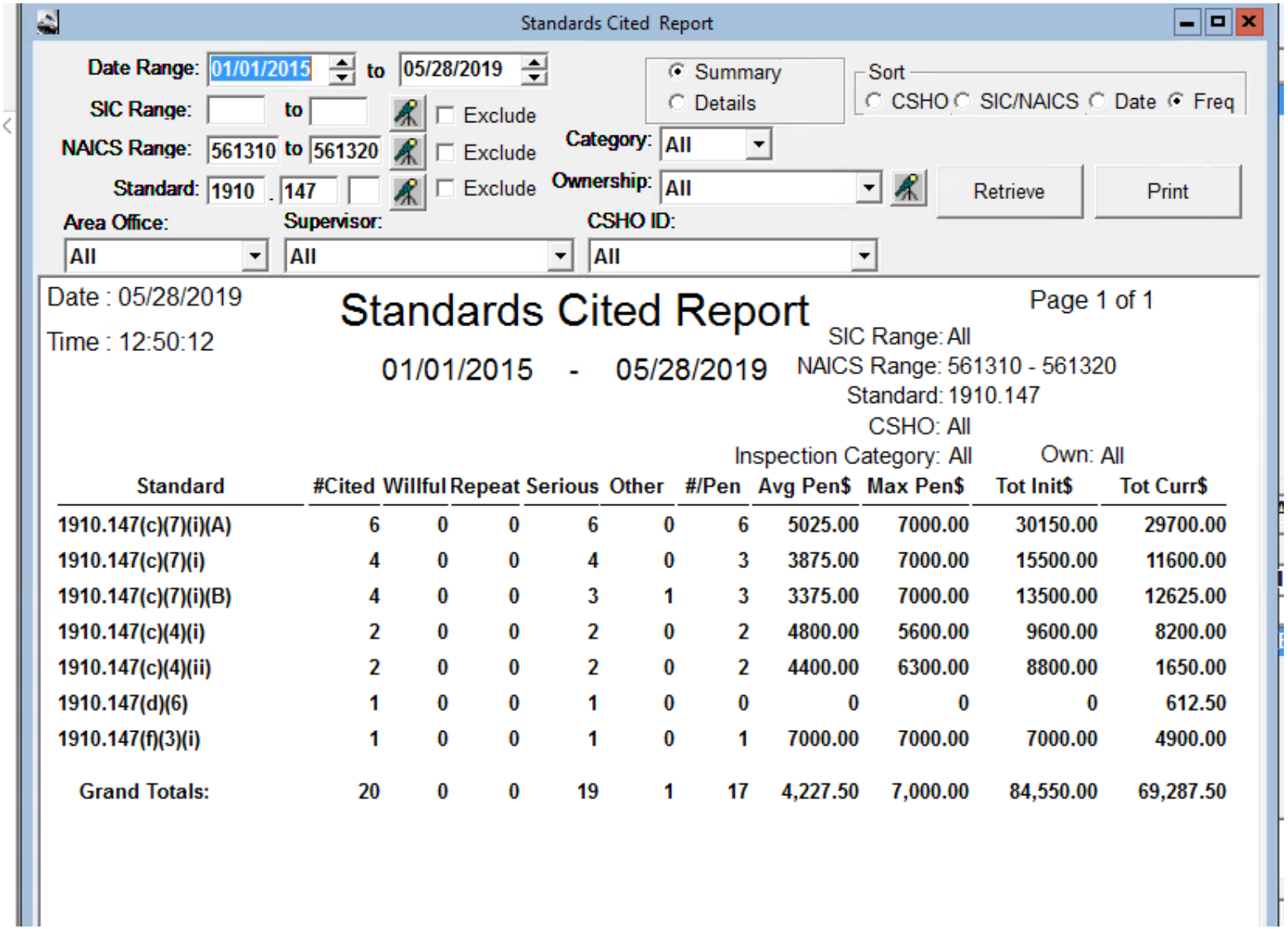
1910.147(c)(4)(ii)(B)	24	0	0	23	1	18	3116.67	7000.00	74800.00	33910.00

29 CFR 1910.147(c)(4)(ii)(B): The energy control procedures did not clearly and specifically outline the specific procedural steps for shutting down, isolating, blocking and securing machines or equipment to control hazardous energy:

a) Dock #23 – where the energy control procedures did not include specific procedural steps to control the hazardous energy associated with gravity on the Kelley dock leveler, Model Number H7X8P, Serial Number 10012121. On July 13, 2016 an employee was crushed beneath the ramp of the dock leveler.

1910.147 Citations – Temp Agencies



Standard	#Cited	Willful	Repeat	Serious	Other	#/Pen	Avg Pen$	Max Pen$	Tot Init$	Tot Curr$
1910.147(c)(7)(i)(A)	6	0	0	6	0	6	5025.00	7000.00	30150.00	29700.00
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1910.147(c)(7)(i)(B)	4	0	0	3	1	3	3375.00	7000.00	13500.00	12625.00
1910.147(c)(4)(i)	2	0	0	2	0	2	4800.00	5600.00	9600.00	8200.00
1910.147(c)(4)(ii)	2	0	0	2	0	2	4400.00	6300.00	8800.00	1650.00
1910.147(d)(6)	1	0	0	1	0	0	0	0	0	612.50
1910.147(f)(3)(i)	1	0	0	1	0	1	7000.00	7000.00	7000.00	4900.00
Grand Totals:	20	0	0	19	1	17	4,227.50	7,000.00	84,550.00	69,287.50

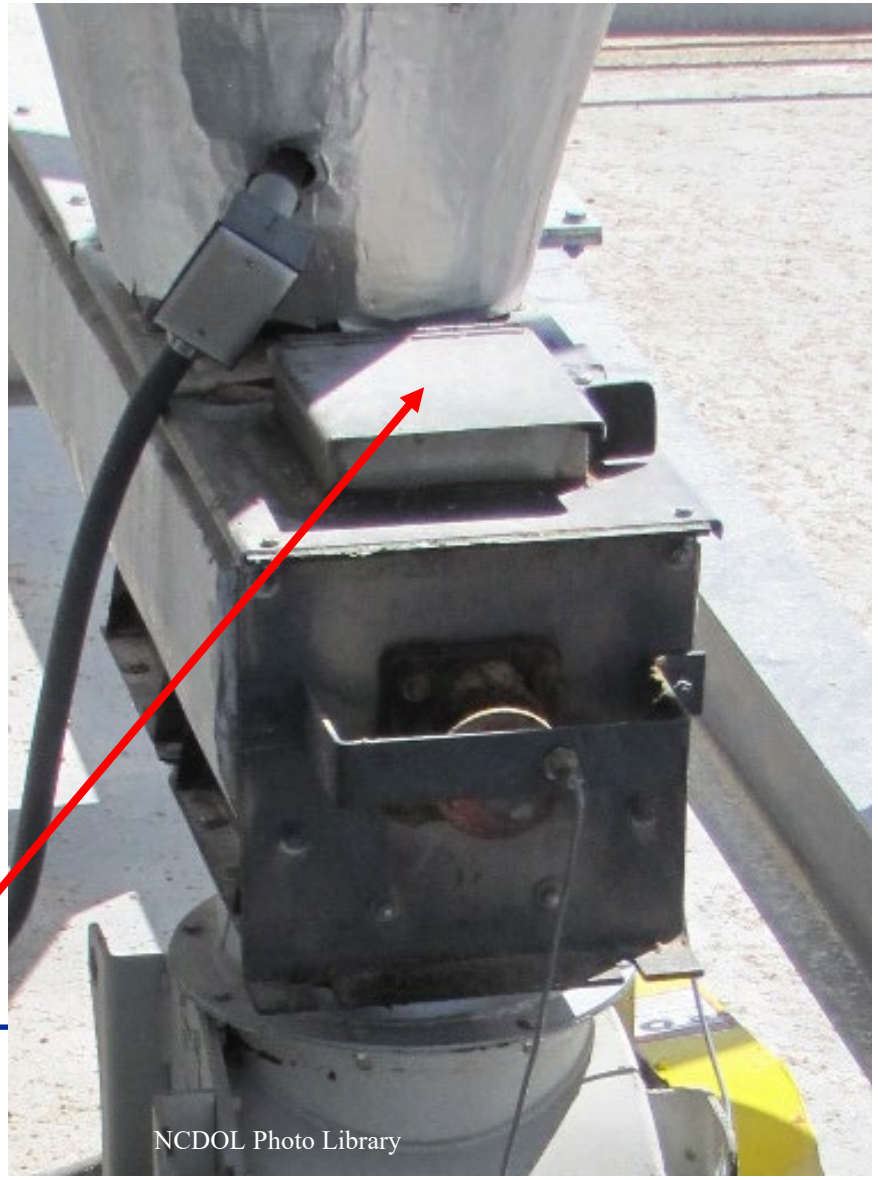
Case Study #1 – Mountaire Farms

- Let's begin with a straight-forward LOTO example.
- A maintenance employee went to the roof to address a clogged screw conveyor.
- Inspection 318100922

Case Study #1 – Mountaire Farms

- At just before midnight, an alarm signaled in the control room that the Goodman screw conveyor was plugged. It moves “fines” for the feed mill.
- Operator took it offline and radioed a maintenance mechanic to investigate. He found the exit lid had popped-up due to the clog.
- The mechanic spent 90 minutes attempting to unclog the plugged conveyor using a 4’ PVC pipe (1/2-inch diameter).

Case Study #1 – Mountaire Farms



The maintenance mechanic spent 90 minutes attempting to unclog the conveyor through this opening with a 4’ long PVC pipe.

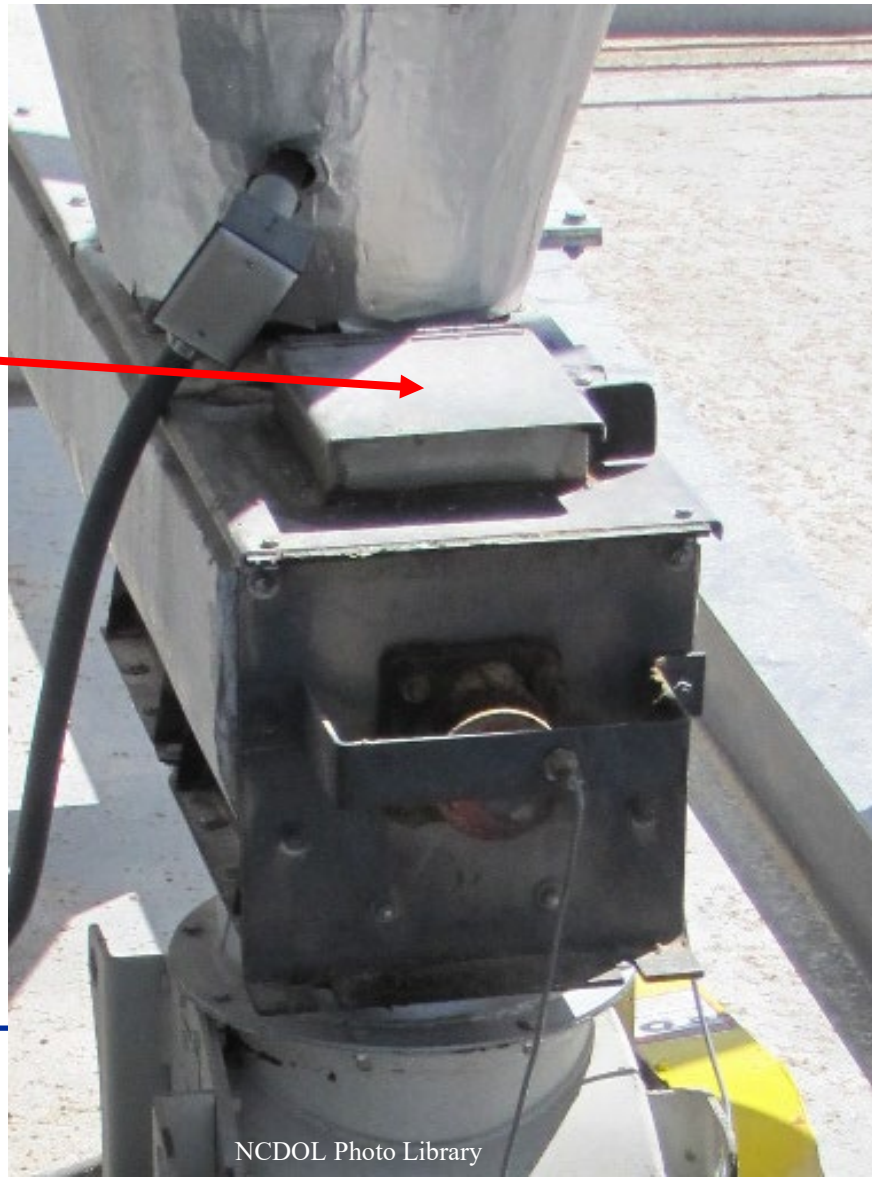
Case Study #1 – Mountaire Farms

After each attempt, he would radio the control room operator to turn on the conveyor to see if material would flow. There were 20+ attempts in 90 minutes.

Case Study #1 – Mountaire Farms

At 1:45 am, the mechanic reached into the opening with his left hand to feel for any build-up on the screw when it suddenly started turning.

He suffered the degloving of his lower left arm from the elbow to the wrist and fractured left thumb.



Case Study #1 – Mountaire Farms

- The employer had a LOTO policy, but had not developed a written energy control procedure for this equipment because the activity fell under the minor servicing exemption. Other elements of the program were in place.
- The employer's counsel stated there was no employee exposure because the policy required the use of the PVC pipe to clear the jam.
- What should be cited in this situation?

Case Study #1 – Mountaire Farms

- Does the minor serving exemption apply?

The first set of criteria for determining the application of the minor servicing exception is whether the activity must take place during, and is inherent to, normal production operations. These servicing activities must be necessary to allow production to proceed without interruption. Additionally, the minor servicing activity must be:

A. Routine: The activity must be performed as part of a regular and prescribed course of procedure and be performed in accordance with established practices.

B. Repetitive: The activity must be repeated regularly as part of the production process or cycle.

C. Integral: The activity must be inherent to the production process.

Case Study #1 – Mountaire Farms

- Does the use of the PVC pipe prevent exposure to the hazard?

As a general principle, the LOTO standard does not apply to servicing and maintenance activities when employees are not exposed to hazardous energy. Therefore, employees can be protected from these severe workplace injuries and fatality incidents by:

1. LOTO – i.e., 29 CFR §1910.147;
2. Complying with the minor servicing exception to the LOTO standard – i.e., the note contained in §1910.147(a)(2)(ii);
3. Utilizing the cord and plug connected equipment or hot tap exemptions – i.e., §§ 1910.147(a)(2)(iii)(A) and (a)(2)(iii)(B);
4. Effective machine guarding, in compliance with Subpart O, that eliminates or prevents employee exposure from the hazardous energy associated with the machines or equipment;
5. Final actions granting LOTO standard variances (e.g., energy isolating device equivalency) in accordance with the §1905 rules; or
6. Other applicable portions of Part 1910 (e.g., guarding and LOTO contained in Subpart R special industries standards; electrical lockout and tagging requirements contained in §1910.333) that prevent employee exposure to hazardous energy.

Case Study #1 – Effective Guarding?

The following ANSI B11.19-1990 safeguarding techniques are compliant with the OSHA Subpart O requirements, for normal production operations, as they either: 1) prevent employees from placing their hands or body parts into the hazardous machine area; or 2) prevent or stop hazardous motion of the machine tool, if the employee is exposed to the hazard; or 3) withdraw the operator's hands or body parts before a hazard exists:

a. Barrier guards: fixed, adjustable, and interlocked;
b. Automatic movable barrier devices;
c. Two-hand operating lever, trip and control devices;
d. Single control safeguarding devices;
e. Presence-sensing safeguarding devices: electro-optical, RF, and area scanning;
f. Pull back (pull out) and restraint devices;
g. Safety mat devices.

CPL 02-00-147, page 2-26

Case Study #1 – Effective Guarding?

Section 12 of the ANSI B11.19-2003 standard does not classify complimentary equipment (e.g., work-holding equipment; hand tools; stop and emergency stop devices) as safeguarding devices because they do not prevent or detect inadvertent access to a hazard. The use of complimentary equipment is vital to hazard mitigation, but the sole use of this equipment does not constitute compliance with the Subpart O requirements.

CPL 02-00-147, page 2-27

Citation and Notification of Penalty

Company Name: Mountaire Farms of North Carolina Corp.
Inspection Site: 203 Morris Farm Road, Candor, NC 27229

Citation 01 Item 001 Type of Violation: **Serious**

29 CFR 1910.147(c)(4)(i): Procedures were not developed, documented and utilized for the control of potentially hazardous energy when employees were engaged in the activities covered by this section:

a) facility, third floor roof - where on or about March 7, 2017, equipment specific energy control procedures were not developed and utilized for the control of potentially hazardous energy for employees performing servicing and/or maintenance activities on the Goodman screw conveyor.

Date By Which Violation Must Be Abated: **Immediately Upon Receipt**
Proposed Penalty: **$5,000.00**

Sullivan, Paul

From: Cordaro, Tressi L. (DC) <Tressi.Cordaro@jacksonlewis.com>
Sent: Tuesday, September 19, 2017 12:51 PM
To: allen.mcneely@labor.nc.gov; Sullivan, Paul
Cc: Byrne, Cara
Subject: Mountaire Farms - Abatement Certificate
Attachments: 2017-09-19_Abatement Certificate OSHANC 2017-5916.pdf

Allen, Paul,

Attached please find the abatement certificate and supporting documents for Inspection No. 318100922, a copy was sent via fax earlier today as well. Payment for the full penalty was sent yesterday. A notice of withdrawal of the notice of contest in this matter will be filed with the Review Commission tomorrow.

Paul – can you confirm receipt.

Thanks – Tressi Cordaro

The Final Result

Tressi L. Cordaro
Attorney at Law*
Jackson Lewis P.C.
10701 Parkridge Blvd.
Suite 300

Case Study #2 – Johnson Concrete

- Now we're getting a bit more complicated.
- This case involves an accident involving machine *operators*, including two that are temporary employees.


NCDOL Photo Library

Case Study #2 – Johnson Concrete

- Initial referral hazard description:
  - The employee, a temporary worker, was working with one or more other employees on an MBK 450 cage welder machine, which makes the wire support that the concrete is poured around. Metal rods are fed into the machine where they are welded to form the cage. The cage got hung up/caught and the employees climbed past the railing system and tried to pull it out. While they were doing this, one of the wheels that rotates the wire moved and rolled on and fractured the employee's ankle.
  - The employee was transported from Salisbury to Baptist Hospital in Winston-Salem.

Case Study #2 – Johnson Concrete

Final product from the MBK 450 wire cage welding machine

Case Study #2 – Johnson Concrete

- A temporary employee was working with two other employees on the MBK 50 cage welder machine. The cage got hung-up/caught and the employees climbed past the railing system and tried to pull it out.
- When all three employees were standing on, or between the base frame railing, the machine unexpectedly became operational. It moved and caught the victim's foot between the stationary support I-beam and the moving feed wheel support console.
- The 24-year old victim suffered a severely fractured ankle. After multiple surgeries, his lower right leg was amputated, just below the knee.

- **Employee demonstrating where they stand to remove the cage.**

The equipment was completely locked out during this demonstration.

Case Study #2 – Johnson Concrete

Case Study #2 – Johnson Concrete

- The employer had a general LOTO program in place, but they didn't have specific procedures for the MBK 450.
  - Machine is not cord and plug, and has electrical, hydraulic, and pneumatic energy.
- The employer had a LOTO training program in place, but neither of the temp employees had received training.
- What citations would you recommend in this case?

Case Study #2 – Johnson Concrete

Citation 01 Item 001 Type of Violation: **Repeat Serious**

29 CFR 1910.147(c)(4)(i): Procedures were not developed, documented and utilized for the control of potentially hazardous energy when employees were engaged in the activities covered by this section:

a) steel cage welding shop, where machine specific energy control procedures were not developed, documented, or utilized to control electrical, pneumatic, and/or hydraulic energies while removing a jammed wire cage from the MBK wire cage welder, model BSM 450. On, or about, 10/6/2017, an employee was seriously injured when his ankle was caught between the moving shaft carriage for the feed wheel and a stationary support I-beam.

JOHNSON CONCRETE COMPANY WAS PREVIOUSLY CITED FOR A VIOLATION OF THIS OCCUPATIONAL SAFETY AND HEALTH STANDARD WHICH WAS CONTAINED IN OSH INSPECTION NUMBER 318032406, CITATION 01, ITEM 001a, WITH A FINAL ORDER DATE OF 7/11/2016.

Date By Which Violation Must Be Abated: **Corrected During Inspection**
Proposed Penalty: **$11,200.00**

Case Study #2 – Johnson Concrete

Citation 02 Item 001 Type of Violation: **Serious**

29 CFR 1910.147(c)(7)(i)(A): Authorized employee(s) did not receive training in the recognition of applicable hazardous energy sources, the type and magnitude of the energy available in the workplace, and the methods and means necessary for energy isolation and control:

a) steel cage welding shop, where two temporary employees were performing servicing and maintenance on the MBK BSM 450 cage welding machine and were not trained as authorized employees.

Date By Which Violation Must Be Abated: **Corrected During Inspection**
Proposed Penalty: **$5,600.00**

Case Study #2 – Johnson Concrete

- The employer was also cited for the failure to guard a pinch point hazard on the machine *during normal operation*.

- The employer requested an informal conference, where no changes were made. They paid the full penalty of $22,400 without contesting.

- What should be done about the temporary staffing company?

Case Study #2(a) - Staffmasters

- Inspection 318120979
- Should they be cited for the failure to develop. Document, and utilize energy control procedures?
- Should they be cited for not training their two employees as authorized employees?
- What would you recommend and why?

Case Study #2(a) - Staffmasters

Citation and Notification of Penalty

Company Name: Staffmasters, LLC
Inspection Site: 217 Klumac Rd., Salisbury, NC 28144

Citation 01 Item 001 Type of Violation: **Serious**

29 CFR 1910.147(c)(7)(i)(B): Affected employees were not instructed in the purpose and use of the energy control procedure:

a) Johnson Concrete Company Salisbury Warehouse, where two Staffmasters employees were assigned to be an "MBK Welder Helper" and did not receive training as affected lockout/tagout employees.

Date By Which Violation Must Be Abated: **Corrected During Inspection**
Proposed Penalty: **$2,500.00**

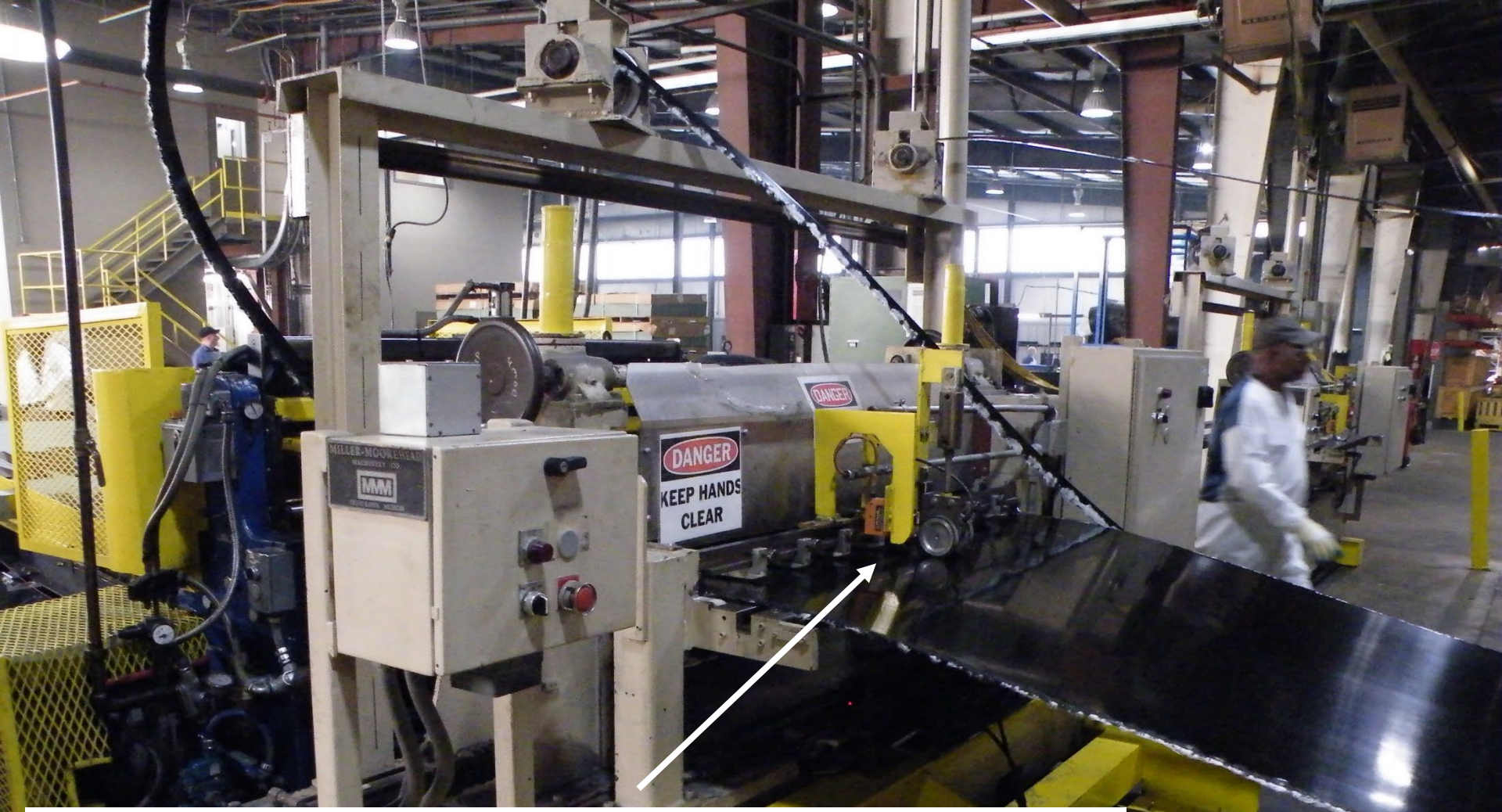
Case Study #2(a) - Staffmasters

- Staffmasters requested an informal conference in this case. They explained all employees receive general S&H training prior to being assigned – and requested the citation be deleted.
- Part of the evidence in this case was the Staffmasters Client Evaluation form, which noted employees would be “making cages from steel pipe.” That was done with the MBK 450.
- The employer signed an ISA keeping the serious violation and reducing the penalty by 35%. The also agreed to some additional stipulations.

Case Study #3 – Hanwha Adv. Materials

- This is another case involving machine operators.

- This was a glass-mat-reinforced thermoplastic process where polypropylene is combined with glass in an extrusion process to form sheets of material. The process on the accident machine involved slitting and cutting of the material.



Thermoplastic material coming into the slitter is cut it into specified widths. It then goes to the vertical shear. A "bow-up" occurs at this location when there is a break in the material in the slitter or a mis-feed from the slitter to the shear.

NCDOL Photo Library

Thermoplastic material after going through the slitter and shear.

NCDOL Photo Library

Thermoplastic material after going through the slitter and shear.

NCDOL Photo Library


Shear – accident location
WARNING
WYSONG
NCDOL Photo Library

Case Study #3 – Hanwha Adv. Materials

- One of the operators suffered an amputation of the tip of their thumb.
- CSHO determined that written LOTO procedures were in place for jobs identified as service and maintenance activities. Training had been conducted for affected and authorized employees.
- What citation(s) would you recommend in this situation?

Citation 01 Item 001 Type of Violation: **Serious**

29 CFR 1910.147(c)(4)(i): Procedures were not developed, documented and utilized for the control of potentially hazardous energy when employees were engaged in the activities covered by this section:

a) Laminator Line 3, Vertical Shear - where energy control procedures to protect employees from exposure to the line 3 Vertical Shear (Wysong model MS-1050-RKG, serial number P80-142) while performing servicing and maintenance activities, including but not limited to, removing or clearing a jam caused by a material build up, had been developed but were not utilized to clear material jams during production operations and on April 2, 2018, while attempting to clear a material jam from the machine, a temporary worker suffered a partial fingertip amputation when she reached around a guard to remove material from the vertical shear.

b) Laminator Line 3, Horizontal Slitter - where energy control procedures to protect employees from exposure to the Miller Moore slitter 1 (serial number 96238162-004) or slitter 2 (serial number 96238162-003) while performing servicing and maintenance activities, including but not limited to, removing or clearing a jam caused by a material build up, had been developed but were not utilized to clear material jams during production operations.

Date By Which Violation Must Be Abated:	**7/23/2018**
Proposed Penalty:	**$6,300.00**

Case Study #3 – Hanwha Adv. Materials

- The employer also cited for three instances of 1910.212(a)(1) for the lack of guarding on the line *during normal production operations*.

- The employer requested an informal conference and ultimately agreed to both the LOTO and machine guarding items. The serious classification remained and the penalty was reduced by 25%.

Case Study #4 – Genpak LLC

- One final case study is Genpak LLC (inspection 318137759) where a press operator suffered the partial amputation of the right hand and four fingers.

- This is a thermoforming process that uses plastic sheeting or film. It is on a roll and fed through the thermoformer. At the time of the accident, it was manufacturing plastic cup lids for a major food chain.

Case Study #4 – Genpak LLC

NCDOL Photo Library


REACHING INTO PLATENS
AVOID INJURY
USE
HAND RAIL
NCDOL Photo Library

Case Study #4 – Genpak LLC

NCDOL Photo Library

ent of Labor for safety and health training.

Case Study #4 – Genpak LLC

NCDOL Photo Library

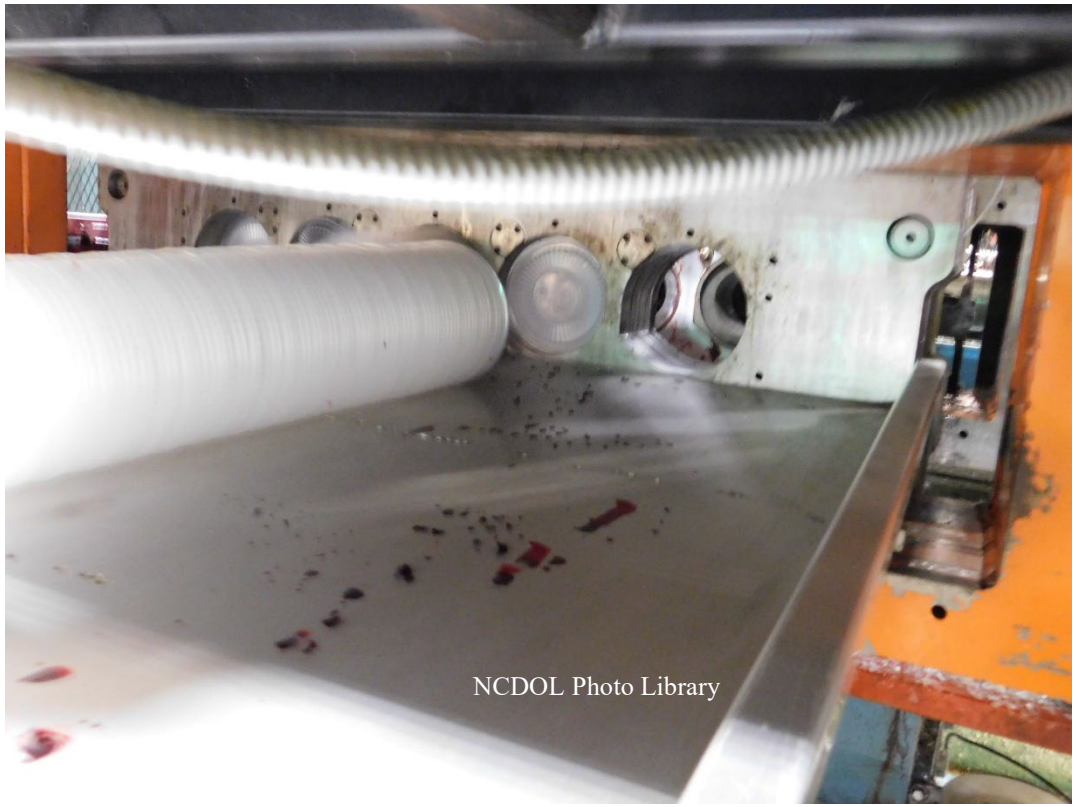
Case Study #4 – Genpak LLC

- Employee was an operator on the Magnum thermo forming line and had worked only five days following his orientation before the accident. He was trained for one day and then allowed to work independently.

- The plastic roll was being changed at the time of the accident. When this is occurring, the machine "idles." During this time, the machine operates at 24 cycles/minute. Employees are instructed to "clean" the packing table and surrounding areas of extra lids during this time.

Case Study #4 – Genpak LLC

- The victim noted he had observed co-workers reaching in to get loose lids while cleaning during the idle mode. He reached in and allegedly his right foot slipped on a lid and his hand went into the die.



Case Study #4 – Genpak LLC

NCDOL Photo Library

Case Study #4 – Genpak LLC

NCDOL Photo Library

Case Study #4 – Genpak LLC

- The employer had a LOTO program but was aware employees were trained to clean without utilizing energy control procedures during the “idle” mode when the roll was being changed.
- The employer’s LOTO program had blank periodic inspection forms in Appendix A and B, but the employer hadn’t completed any of those inspections.
- The victim had not received any LOTO training since being hired.
- What citations will you recommend?

Case Study #4 – Genpak LLC

Citation 01 Item 001 Type of Violation: **Serious**

29 CFR 1910.147(c)(4)(i): Procedures were not developed, documented and utilized for the control of potentially hazardous energy when employees were engaged in the activities covered by this section:

a) within the facility, the employer had developed a lock-out/tag-out procedure, but was not utilizing the procedure for control of hazardous energy where employees were engaged in activities, to include but not limited to, cleaning and maintenance of the Magnum Thermoformer trim press # IR2, while the machine was in "idle" mode, operating at 24 cycles per minute. On May 25, 2018, an employee was seriously injured while cleaning the machine during idle mode without the use of energy control procedures.

Date By Which Violation Must Be Abated: **10/8/2018**
Proposed Penalty: **$7,000.00**

Case Study #4 – Genpak LLC

Citation 01 Item 002 Type of Violation: **Serious**

29 CFR 1910.147(c)(6)(i): The employer did not conduct a periodic inspection of the energy control procedure at least annually to ensure that the procedure and the requirement of this standard were being followed:

a) within the facility, the employer failed to conduct periodic inspections of the energy control procedures for the Magnum Thermopress trim machines, # IR1, IR2, IR3 and TS4 to ensure the lock and tag procedure was being utilized and correctly implemented.

Date By Which Violation Must Be Abated:	**10/8/2018**
Proposed Penalty:	**$7,000.00**

Case Study #4 – Genpak LLC

Citation 01 Item 003 Type of Violation: **Serious**

29 CFR 1910.147(c)(7)(i)(A): Authorized employee(s) did not receive training in the recognition of applicable hazardous energy sources, the type and magnitude of the energy available in the workplace, and the methods and means necessary for energy isolation and control:

a) within the facility, the employer did not ensure that authorized employees had been instructed on use of the lock and tag procedures associated with the Magnum Thermoforming trim press machines, where employees were engaged in activities, to include but not limited to, cleaning, while the machine is in "idle" mode. This can result in employee exposure to hazardous energies to include, electrical and mechanical. On May 25, 2018, lack of training of authorized employees on the lock and tag procedure resulted in the amputation of an employee's right hand to the base of the thumb area, as it was caught between the die and the platen.

Date By Which Violation Must Be Abated:	**10/8/2018**
Proposed Penalty:	**$7,000.00**

Machine Operators – What have we learned?

- We need to understand the operation, the machinery & equipment, and the operators' duties.
- CSHOs need to specifically ask the operators about how they handle product jams and other upset conditions, as well as other "servicing and/or maintenance" activities, such as:
  - Cleaning
  - Lubricating
  - Setting-up
  - Inspections/trouble-shooting
- Are the operators utilizing LOTO procedures during these activities? If not, does it fall under the minor servicing exemption? Are alternative measures (such an interlocked guard) in place?

Machine Operators – What have we learned?

- Remember to look closely at LOTO training for these operators.
  - Training and other program violations are established almost completely through **interviews**.
- If they are conducting servicing and/or maintenance activities, they must be trained as an Authorized Employee.
- Don't forget to ask about periodic inspections of the energy control procedures. Have them walk you through an example inspection. Are they having an authorized employee actually observe another authorized employee implement the procedure during the audit?

Questions?