

Lockout/Tagout and Machine Guarding: The “Minor Servicing” Exception

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Introduction

The OSHA Control of Hazardous Energy (Lockout/Tagout) (LOTO) Standard (29 CFR 1910.147) is one of the more complex federal safety regulations. Compliance with the Standard is further complicated by its inter-relation with two other significant standards – a connection that frankly, many people fail to make.

This session will focus on the steps that must be taken when an employer wishes to take advantage of the “minor servicing” exception to the requirements for implanting full lockout/tagout during certain operational activities. It will also discuss how the Electrical Safety Standard (29 CFR Subpart S) and Machinery and Machine Guarding Standard (29 CFR Subpart O) come into play when performing tasks under the “minor servicing” exception.

Application of the Lockout/Tagout Standard

The “Application” section of the LOTO Standard (20 CFR 1910.147(a)(2)(ii)) states:

Normal production operations are not covered by this standard (See Subpart O of this Part). Servicing and/or maintenance which takes place during normal production operations is covered by this standard only if:

- 1910.147(a)(2)(ii)(A) - An employee is required to remove or bypass a guard or other safety device; or
- 1910.147(a)(2)(ii)(B) - An employee is required to place any part of his or her body into an area on a machine or piece of equipment where work is actually performed upon the

- material being processed (point of operation) or where an associated danger zone exists during a machine operating cycle.

Note: Exception to paragraph (a)(2)(ii): Minor tool changes and adjustments, and other minor servicing activities, which take place during normal production operations, are not covered by this standard 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 (See Subpart O of this Part).

Many employers will attempt to take advantage of the exception for “minor servicing activities” without having thoroughly evaluated each requirement that must be met in order to truly qualify for it.

First, the definition of such activities must be properly understood. In addition to the language in the actual standard, the Compliance Directive for LOTO (CPL 02-00-147) lists the following as examples of routine activities which can frequently be done with effective production mode protections like machine guarding:

- lubricating,
- draining sumps,
- servicing filters,
- making simple adjustments, and
- inspecting for leaks and/or malfunction

In its letters of interpretation, OSHA has also clarified that set-up of equipment is never considered as “minor servicing” activity.

(NOTE: CPL 02-00-147 can be found online at http://osha.gov/OshDoc/Directive_pdf/CPL_02-00-147.pdf)

Second, the need for equivalent protection must be understood. This topic is addressed in *ANSI/ASSE Z244.1 - 2003 (R2008) Control of Hazardous Energy Lockout/Tagout and Alternative Methods*.

Finally, employers must keep in mind that the Electrical Safety Standard (29 CFR Subpart S) states that activities such as electrical circuit testing, troubleshooting and diagnosis which require live equipment are not covered by the requirement to lock out, but do require a “qualified person” to do the work. Therefore, if work will be done under the minor servicing exception and there is any potential for the employee to contact live electrical circuits, such work must be done by a qualified electrician, not just an operator.

ANSI/ASSE Z244.1 - 2003 (R2008)

The ANSI Standard states that the risks of potential exposure to hazardous energy should be reduced through a hierarchy of controls. The preferred method is always to engineer out the hazard, and the next best method is to use lockout/tagout. If an employer wishes to use an alternative to those methods, the Standard calls for conducting a risk assessment to ensure that the alternate methods will be adequately protective.

The risk assessment should be documented, and should include the following steps:

- identify all tasks
- identify hazards
- assess the potential consequences
- assess the potential exposure to the hazards
- assess the probability of occurrence
- evaluate the risk
- evaluate potential controls and select the most protective
- achieve a level of risk no higher than would be achieved by using lockout/tagout

The following hierarchy of potential controls is given:

- use of engineered safeguards such as area scanners, guards, light curtains, pressure mats, presence sensing devices, or stop devices under exclusive control of the operator
- use of warning and alerting devices to include audible, visual devices, or barricades
- use of administrative controls such as safe work procedures, practices, and training
- use of personal protective equipment as appropriate to hazard

Engineered Safeguards

Engineering safeguards are almost certainly the trickiest to evaluate for effectiveness. What is often overlooked in such an evaluation is that machine guarding is typically designed only with normal operations in mind. Guards that are perfectly acceptable during normal operations may or may not provide adequate protection during servicing type activities when employees will intentionally place their hands or other parts of their bodies into hazardous areas of the machine. Typical guards include:

- Interlocks
- E-Stops
- Presence Sensors
- Light Curtains
- 2-Hand Activated Push Buttons

CPL 02-00-147 gives a detailed discussion as to how OSHA views these various types of guarding systems, keeping in mind that the key requirement for qualifying for the minor

servicing exception is that the guarding must be “equivalently effective” to locking out the machine.

On page 2-24 of the CPL, OSHA states: Safeguarding devices (e.g., presence-sensing safeguarding devices) that rely on control circuitry and are used for employee protection purposes may not be used in lieu of LOTO during machine servicing/maintenance activities because control circuit devices are not, by definition, energy isolating devices. Further definition of devices that may not be used in lieu of LOTO is found on page 1-5, as follows: “Push-buttons, selector switches, safety interlocks and other control circuit type devices are NOT energy isolating devices. Programmable logic controllers (PLCs) are used in many machine applications, and these control circuit devices are not considered energy isolating devices for purposes of the LOTO standard. Safety functions, such as stopping or preventing hazardous energy (motion), can fail due to component failure, program errors, magnetic field interference, electrical surges, improper use or maintenance, etc.”

So what devices will qualify as providing equivalent protection? In the CPL, OSHA states that approaches taken in accordance with ANSI standard B11.19 1990 or 2003 - Performance Criteria for Safeguarding will be “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.” (A detailed discussion of these approaches, with industry-specific examples can be found on pages 3-27 through 3-32.) It also states that these guard devices must be under the exclusive control of the employee performing the minor servicing. Note that this can be complicated if more than one person is working on the minor servicing, and lockout may then be required.

How can you tell fairly easily whether a guard device will meet ANSI B11.19? Well, if it was installed by anyone other than the machine’s manufacturer, there’s a good chance it won’t. If it was manufactured prior to 2004, it probably won’t. Obviously, check the device manufacturer’s literature for certifications, and in the case of emergency stops (e-stops) check specifically for certification as a “fail-safe” device. While reviewing the manufacturer’s information, it’s also critical to determine what sort of routine inspection, maintenance and servicing they recommend for the device. Failure to follow those recommendations can mean that the device would no longer be reliable, which could lead to an OSHA violation for not providing equivalent protection, or much more important, to an injury. How often are the interlocks tested?

If the employer can’t find any documentation relating to whether or not a guard meets ANSI B11.19, what other steps can be taken to determine if it provides the equivalent protection that allows them to take advantage of the minor servicing exception? The first thing would be to verify what, if any, hazard an employee could be exposed to during the specific activity being performed. (Note that the use of a tool to reach into the hazard zone can change this part of the analysis.) Then conduct some type of documented failure analysis of the control system that’s being relied on to protect the employee from that hazard. Techniques could include a Failure Modes and Effects Analysis (FMEA), fault tree analysis, or “what-if”

analysis. There also needs to be an evaluation of whether there are procedures to test if the deactivation that's being relied on has worked, and whether the guard device is being properly tested and maintained.

If the employer is relying on an e-stop, consider the following:

- How does it really work, and what does it actually shut off? Only electrical power, or other potential sources of hazardous energy? (A surprising number of people don't really know these details.)
- If the e-stop button is released, is the machine back in full operational mode, or are additional steps needed to restart it?
- Is there still exposure to energized electrical circuits after the e-stop has been activated?
- Is e-stop certified as "fail-safe"?
- Is an e-stop button truly under the exclusive control of the operator performing the minor servicing activity?
- If the employer is relying on an interlock, consider the following:
 - Is the interlock certified? Does it include a "high reliability interlock switch"?
 - Is the interlock properly tested and maintained?
 - Will there be exposed power points?
 - Will there be stored energy/other types of energy?

Summary

Taking advantage of the "minor service" exception to LO/TO is much more complicated than it first appears. The employer must ensure that any measure used as an alternative to lockout/tagout is equally protective. To accomplish this, the employer should conduct a formal, documented risk assessment of the alternatives. Reliance on machine guarding that was designed for normal operations may not be appropriate in situations when employees must intentionally place parts of their bodies into areas with a potential hazard. Employers must go beyond the basic Lockout/Tagout Standard and consult the associated Compliance Directive as well as ANSI Z244-1 and ANSI B11-19 to ensure they are properly protecting their employees as well as fully complying with OSHA requirements when performing minor servicing operations.+