Student Lockout/ Tagout Exercise

CASE STUDIES

Case Study: Printing Press Roll Cleaning

A printing press produces printed materials as its normal production function. The printing press's rollers have to be cleaned periodically during the work shift to ensure quality control.

In this scenario, the press is not shut down for the cleaning operation. The printing press is energized and its rollers continue to spin at a very high speed. In order for employees to clean the rollers they must bypass the printing press's machine guards, and use rags to clean the rollers. This exposes them to serious, ingoing nip point hazards created by the rollers. Severe laceration or amputated fingers could result if the rag or an employee's hand were to get caught in the rollers or in an area between the rollers and a fixed part of the machine.

Although the employer has a lockout/tagout program for servicing and/or maintenance of the printing presses, for this particular cleaning operation the employer believes that lockout/tagout procedures do not need to be implemented. According to the employer, this cleaning operation is exempt from lockout/tagout requirements because it falls under the minor servicing exemption and therefore the employer allows the equipment to remain operating during the cleaning operation.

Remember, as stated above, the employees are still exposed to the hazardous energy of the printing press' during the cleaning operation.

Question 1 for Case Study:

Is this printing press roll cleaning activity covered by the Lockout/Tagout standard?

- **YES**
- **NO**

Question 2 for Case Study:

The employer argues that the roll cleaning activity is routine, repetitive, and integral to the production operation and that lockout is not required because the minor servicing exception described in 1910.147(a)(2)(ii) is applicable. Is the employer correct?

- **YES**
- **NO**

Case Study: Replacement of Nitrogen Pressure Vessel Seals

A group of employees are assigned to replace the head seals on twelve large nitrogen pressure vessels (accumulator bottles) at a manufacturing facility. Each pressure vessel has an operating pressure of about 5,000 psig. Replacement of the seals on each vessel requires that its head be opened, releasing any vessel contents to the atmosphere. The vessels lack individual gauges to indicate internal pressure levels.

Question 1 for Case Study:

Did the pressure within the nitrogen vessels constitute hazardous energy?

- **YES**
- **NO**

Question 2 for Case Study:

Were the employees performing a servicing and/or maintenance operation that was subject to unexpected energization, start up, or release of hazardous energy?

- **YES**
- **NO**

Question 3 for Case Study:

Does the Lockout/Tagout standard apply to this particular servicing and/or maintenance operation?

- **YES**
- **NO**

Question 4 for Case Study:

Would the group lockout or tagout provisions apply to this operation?

- **YES**
- **NO**

Question 5 for Case Study:

Is the employer required to use a work authorization permit?

- **YES**
- **NO**

Case Study: Multiple Energy Control Procedures

A manufacturing facility has 130 separate lockout procedures. Many of these procedures are unique, and apply to specific pieces of equipment. Some of these

procedures, however, are duplicate and address pieces of equipment that are essentially identical to another piece of equipment. The facility has 40 employees authorized to implement the 130 procedures in performing service and maintenance covered by the Lockout/Tagout standard.

The employer has implemented the following procedure for conducting periodic inspections: for the specific energy control procedures, each of the authorized employees is observed by another authorized employee performing a complete lockout of at least one piece of equipment or machinery utilizing each one of the separate energy control procedures. The employer documents each of these inspections. However, there are more specific procedures than there are authorized employees, so consequently some of the specific procedures are not observed being implemented. Instead, these procedures are inspected by holding meetings with small groups of authorized employees responsible for service and maintenance on machines or equipment covered by the procedures being reviewed. At these meetings, the relevant procedures are reviewed by the group to ensure that they are understood and effective, but actual lockout implementation is not required during the inspection.

Question 1 for Case Study:

Does this scenario meet the standard's requirement that the employer conduct a periodic inspection for all energy control procedures?

- **YES**
- **NO**

Case Study: Overhead Crane Servicing and Maintenance

A millwright is assigned to a servicing and maintenance task on an overhead crane. The employee initiates the prescribed energy control procedure by turning "off" the crane's electrical disconnect switch and placing his lock onto this energy isolating device.

However, the disconnect switch lever is corroded, allowing it to physically separate from the disconnect switch assembly. As a result, when the millwright places the lock on the lever in the "off" position, the stub located inside the electrical box remains in the "on" position. The employee does not attempt to verify deenergization by using the crane start button. When he contacts the energized electrical bus bar located near the bridge railings, fatal injury results.

This repairman was trained in the requirements of the Lockout/Tagout standard as an authorized employee. He was not, however, trained as a qualified person under the Electrical-Safety-Related Work Practices standard.Question 1 for Case Study:

Question 1 for Case Study:

Would the activity that resulted in this electrocution, caused by an energized electrical bus bar, be covered by the Lockout/Tagout standard?

- **Yes**
- **No**

Question 2 for Case Study:

Would the Lockout/Tagout standard apply to any aspect of this maintenance activity?

- **Yes**
- **No**

Question 3 for Case Study:

Was the repairman (a millwright by trade) qualified to verify that the circuit was deenergized?

- **Yes**
- **No**

Question 4 for Case Study:

Would the employer be required to develop two separate energy control programs to meet the requirements of both the Lockout/Tagout standard and the Electrical Safety Related Work Practices standard?

- **Yes**
- **No**

Case Study: ***Automotive Component Lubrication Robotics***

At an employer's automotive component manufacturing facility, manufacturing operations make extensive use of robots located within fenced cages. At one location, suspension parts are transferred by rotating tables from station to station while greasing and other operations are performed on the parts by robots. If necessary, employees can gain access to the robots by entering the cages through electrically interlocked gates. When the gates are opened, the multiple energy sources that power the robots, rotating tables, and related machinery are turned off but are not deenergized or locked out. An employee who is inside a cage when a robot is activated could be struck by the robot arm or other machine parts and seriously injured.

An injury occurred when an employee, consistent with the employer's practices, entered the robot cage without deenergizing or locking out any equipment. The employee was attempting to unjam a robot arm. In freeing the arm, the employee tripped an electric eye, causing the robot arm to cycle. The employee's arm was struck by the robot and injected with grease. The employer contends that lockout procedures were not necessary because once the gate is opened, movement of the robot arm is impossible, and a maintenance worker inside the cage would have ample warning – by the closing of the interlocked gate – before the machinery started up, to avoid injury. According to the employer, once the interlocked gate is opened, it must first be closed and a number of buttons must be pushed before any machine movement can occur. The startup procedure would take some time and the person inside the robot area would be aware of the closing of the gate and the presence of another worker at the nearby control panel.

Question 1 for Case Study:

Does the unjamming operation take place during normal production operations?

- **Yes**
- **No**

Question 2 for Case Study:

Would the minor servicing exception apply to this situation?

- **Yes**
- **No**

Case Study: ***Automotive Component Lubrication Robotics (continued)***

Question 3 for Case Study:

Was the activity performed by the employee covered by the Lockout/Tagout standard?

- **Yes**
- **No**

Question 4 for Case Study:

In this situation, would the interlocked gate alone satisfy the employer's Lockout/Tagout obligations?

- **Yes**
- **No**

Question 5 for Case Study:

The employer contends that deenergizing and locking out a robot wipes out the robot's memory and requires time-consuming reprogramming. Based on this alone, could the employer claim that shutting down the robot was impractical and thus, claim that the unjamming task was exempted?

- **Yes**
- **No**