



Occupational Safety and Health Programs

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Lockout/Tagout – A Systems Perspective

The lockout/tagout general industry standard, 29 CFR 1910.147, has been around for close to 20 years now. Even though this regulation is well-known by industry, it continues to be high on the OSHA frequently-cited list. More importantly, many fatalities and serious injuries are experienced due to lack of proper lockout/tagout. These sad facts force us to ask the question, “Why do individuals fail to lock out equipment prior to undertaking dangerous tasks?” This brief tech guide contains a discussion of lockout from a slightly different perspective, dealing with management and individual issues, as opposed to the nuts and bolts of 29 CFR 1910.147 and the lock itself.

When you ask anyone about lockout/tagout, the first thing they think of is the lock. Going beyond the lock, you have to understand what goes through the minds of individuals prior to undertaking dangerous servicing/maintenance tasks. It may help to analyze this problem by looking at some of the past failures and trying to understand what contributing factors may have existed. We did a brief analysis of fatalities that occurred between 2004 and 2009 and were related to the keyword “lockout” when searched at the OSHA web site page on accident data. A total of 59 cases were found (Federal OSHA States only) with the following results:

1. In 59 % of the cases, as is no surprise, it appears that lockout was not used at all. What is interesting is that in several cases, locks were used but were simply not used correctly.
2. In 31 % of the cases, activation equipment was not expected. Again, an interesting point here is that in a majority of cases, the equipment was running and the employees knew it was running, they just made a choice to try to beat the machine.
3. In 31 % of the cases, greater than 1 person was involved in the servicing or maintenance activity.
4. In 17% of the cases, timing of the servicing or maintenance activity may have been a factor. For example, work being done at very early or late hours where

So once again, the question remains, “Why would anyone undertake hazardous servicing or maintenance tasks without first following an established lockout/tagout procedure?” The excuses you hear are “I forgot”; “It takes too long”; “I am only going to be doing this for a second”; “I’m just _____”, where the blank can be filled in with any number of tasks that the person feels is too minor to require lockout, only to be found wrong and face the consequences of unexpected activation of the machine. A major factor for individuals not applying lockout is most likely the fact that they do not have a personal association with the hazards and the risks they are taking. For example, if employees are thinking of the fact that they personally can be seriously hurt or killed as a result of unexpected activation, and the effects on their loved ones should that occur, they would be much more likely to follow safe work procedures and lock the equipment out.

An interesting observation that can be made from visiting many industrial locations of the years is that most of the companies that excel in safety, excel in other important areas to the company such as productivity, quality, environmental performance, etc. There are certainly exceptions to this, but a company that is managed

well and has safety as one of its strategic objectives, typically can perform better with respect to safety. Given this fact, if you look at lockout/tagout from a management systems perspective, it seems to make more sense. Consider the illustration below for additional information and discussion on this topic. Many companies are simply trying to comply with what they perceive as the minimum to “satisfy” OSHA for lockout/tagout, as depicted in the left column titled Minimum Lockout Program. The company that takes a systematic approach to solving the problem, by implementing a safety management system, which incorporates lockout/tagout, as well as other hazards, will more likely be successful. This is illustrated in the right-hand column titled Energy Control Management System.

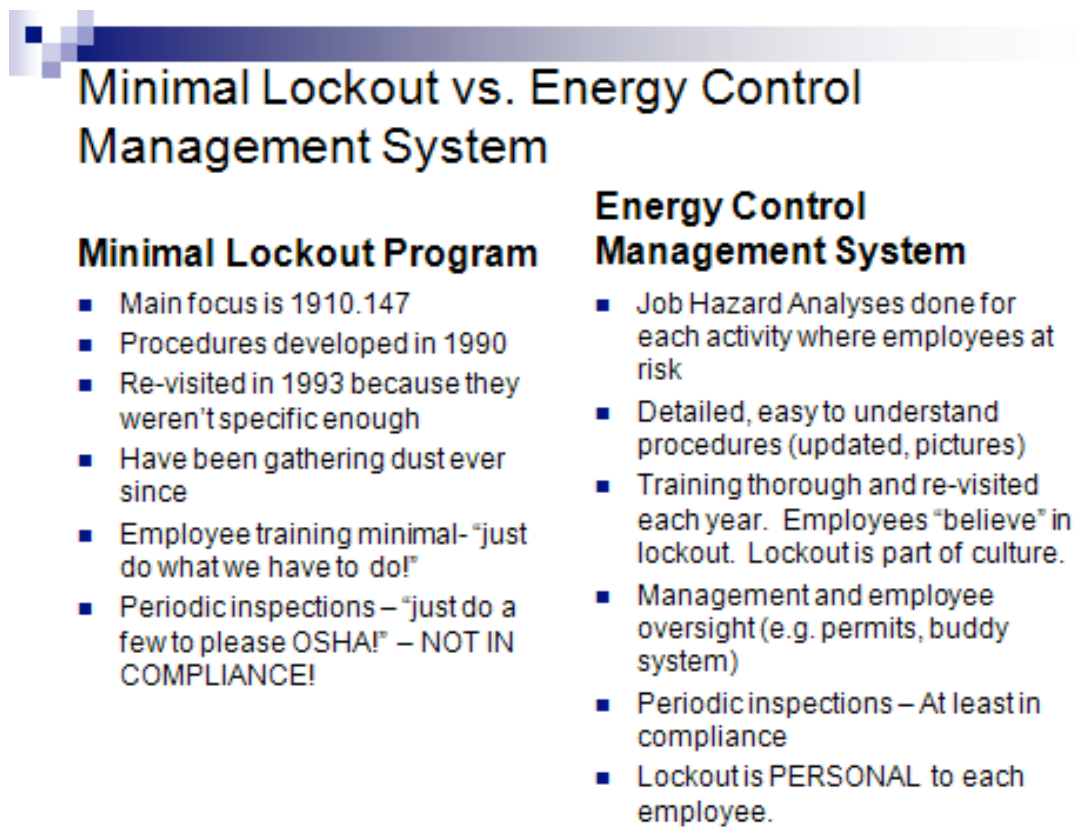


Figure 1. Minimal Lockout vs. Energy Control Management System

Another interesting comparison can be made between the continuous improvement model and lockout/tagout. Many successful companies are implementing ISO 14001 or OHSAS 18001 with this model in mind. Consider the continuous improvement model below (Figure 2) with lockout/tagout principles integrated into the continuous improvement elements. A continuous improvement approach to lockout/tagout may result in better procedures, more effective audits, better retention of training concepts, and other improvements to lockout/tagout performance.



Continuous Improvement (ISO 14001 or OHSAS 18001)

- Plan
 - Lockout Policies
 - Job Hazard Analysis
 - Written Procedures – Specific, clear, easy to understand
 - Training - Effective
- Do
 - Servicing and Maintenance Activities
 - Oversight and Control Functions (Inspections, observations, permits, signs, reminders, etc.)
- Check
 - Periodic Inspections
 - Observations
 - Day-to-day Activities
- Act
 - Refresher Training and New Employee Training
 - Modify Procedures
 - New Equipment – Job Hazard Analyses
- Go back to Plan

Figure 2. Continuous Improvement Model

In summary, it is difficult to assess the safety culture of an organization as it results to lockout/tagout. It is easy to get a feel for safety culture by analyzing how employees behave when management is not around. Employees may know there are certain rules they are supposed to follow, but may actually adhere to other “unwritten” rules that they learn from co-workers and even supervisors that may contradict those formal rules. If a true “safety culture” exists in an organization, formal rules and unwritten rules are consistently driven towards a safer work environment.

Lockout/tagout, as with any safety topic, is a challenge to fully integrate into the safety culture of an organization, but it all starts with true management commitment and employee involvement. True commitment and involvement includes more than just establishment of the procedures and conducting training. It also involves hazard analysis and re-evaluation of performance on a continual basis. While we are never really “there” with respect to lockout, or safety for that matter, the rigorous effort is certainly well worthwhile. The stakes are just too high for organizations not to give it their best effort.