

CINTAR Connection

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Electricity, Arc Flash, Lockout/Tagout and Alternative Protective Measures are Included in our Safety Series

This issue of Cintar Connection is Part Two in our three-part Safety Series. Last issue we introduced our readers to OSHA's FY2017 Most-Cited Standards. With that, we included a discussion about Personal Protective Equipment, Fall Protection, and Fall Protection Training Requirements. In this issue, we will further discuss items on the FY2017 Most-Cited Standards List, specifically those related to electrical safety. If you missed any of our previous newsletters, please visit cintar.com/publications to read them.

Electrical Safety

Electricity is recognized as a serious hazard; to the extent that electrocution is the third highest ranked cause of death in the construction industry, behind Falls and Struck by Objects. On OSHA's Most-Cited Standards list, "Control of Hazardous Energy (Lockout/Tagout)" lands fifth and "Electrical Wiring Methods" lands tenth.

Electricity related accidents can result in electric shock, electrocution, burns, fires and explosions. It takes only 50-100 milliamperes of current to cause death. A 120-volt circuit commonly carries 15-20 amperes of current. This is 300 times what is necessary for an accident to result in a fatality.

Electrical Safety Awareness

OSHA standards have been developed to prevent accidents, injuries and fatalities. For electrical

safety, some examples include standardized coding systems (color coded insulation, labeling, etc.) to warn workers of the hazard before them; specialty PPE required around electricity, which differs from more common jobsite requirements; and arc flash boundaries.

The first rule when working near electricity is to never assume a wire is safe to touch. Use caution when around water and damp conditions. Always be aware of overhead power lines. Only trained, qualified workers should work on energized equipment or circuits. These and other rules are covered in OSHA's training and worksite-specific training. The electrical professionals at Cintar are not only well-trained, they can also provide training.

Arc Flash

Arc flash safety is another aspect of electrical safety. An arc flash, as defined by OSHA, occurs when electric currents leaves its intended path and travels through the air from conductor to conductor or from conductor to the ground. It produces a sudden release of electrical energy through the air, giving off thermal radiation and bright, intense light that can cause burns and other injuries. In addition, arc flashes create pressure waves from the rapid heating of the air, creating a blast that can send metal projectiles at a worker at speeds up to 700 miles per hour.

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Arc Flash Boundaries and potential incident energies are calculated during an Arc Flash Hazard Analysis and are used to alert workers of the dangers of working on energized electrical equipment. Arc Flash hazards are required to be labeled. An Arc Flash Hazard Analysis is required to be conducted when significant changes are made to a power distribution system, or every 5 years. In addition, training and re-training is required by the NFPA 70E at a minimum of every 3 years. An Arc Flash Analysis, Label Review and production and installation of the labels can be provided by Cintar, in addition to the aforementioned training program.

Lockout / Tagout & Alternative Protective Measures

Lockout/Tagout (the Control of Hazardous Energy regulation) went into effect in 1989. This Standard sets the rules for de-energizing equipment, covers servicing and maintenance of equipment, and is meant to prevent the unexpected energization or start-up of equipment. It is among the most expensive of all OSHA violations.

The most common incidents to cause injury include failure to stop equipment, failure to disconnect from the power source, failure to drain residual energy, accidental re-start of machinery and failure to clear work areas before re-starting. In the effort to prevent these occurrences from happening, the regulation was created.



Lockout/Tagout (LOTO) was created to safeguard workers. LOTO uses locks and tags when turning off and disconnecting energy sources for equipment prior to servicing it. The person performing the work holds the key, thus ensuring the equipment cannot be re-connected and energized during maintenance.

However, there are times LOTO is not the best fit for the task, especially when it comes to repetitive or routine production-related tasks. OSHA allows for an exception known as the “minor servicing exception,” or Alternative Protective Measures. Tasks like clearing a jam and aligning or testing equipment are acceptable by OSHA when deemed to be routine, repetitive, and integral to the use of the equipment for production. The point of these APMs is not to allow total unguarded access to the equipment by workers, but it must in the end be exactly as safe as lockout/tagout. Often, this means designing the system with light curtains, guards, indicators and locks to only allow access to the parts of the equipment needed to perform the specific tasks as determined by the Risk Assessment process.

In addition, the ANSI standard ANSI/ASSE Z244.1 (2016) The Control of Hazardous Energy—Lockout, Tagout and Alternative Methods expands OSHA’s regulatory limitation to the routine tasks. When a hazard has been assessed and documented, ANSI/ASSE Z244.1 provides guidance about alternate control methods while performing the task.

Eliminating the hazard during the design process is ideal. When it cannot be done and the risk has not been assessed, LOTO provides the greatest and only appropriate protection.

Employees at Cintar that are involved in lockout/tagout are properly trained and have the appropriate lockout/tagout procedure items.



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