
The Cost of Being Unsafe and How To Reduce the Financial Risk



In today's facilities and workplaces, it's critical to have a comprehensive approach to the policies and practices enacted in your corporate electrical safety program. Creating a safer workplace requires a rigorous enforcement of electrical safety codes and strict adherence to guidelines with close monitoring of industry best practices. This is a lot to account for; but there's also a lot at stake. The cost of doing business safely and responsibly requires profound accountability.

Electrical hazards in the workplace can cause fatalities, but they can also inflict a devastating impact on workers with debilitating and potentially disabling injuries that can cost millions of dollars in treatment. This creates a massive financial burden for any company, in addition to the human toll. There have been significant advancements in safety technology, and with new products coming to the market, it's entirely possible to reduce risk and financial worry by investing in electrical safety.



Electrical Accident Statistics and the Trouble with Human Error

Electrical accident statistics are staggering. In a recent press release, the National Fire Protection Association (NFPA) and Institute of Electrical and Electronics Engineers (IEEE) estimate that over 2,000 workers each year, or more than 5 workers a day, are victims of an arc flash in the U.S. According to the U.S. Bureau of Labor Statistics, electrocution is the fifth leading cause of workplace fatalities in the US. Thousands of workers suffer injuries such as shocks and burns from electrical accidents every year, but this can be drastically minimized by keeping up with regulatory standards while also identifying new ways to maximize the electrical safety investment.

Electrical safety violations can cause accidents, which in addition to the human cost, can also have a significant economic impact on employers in the form of financial penalties, medical and disability expenses after accidents have occurred, and insurance rate increases.

The numbers are hard to ignore, especially when we consider that minor electrical incidents in the workplace often go unreported. Furthermore, according to the National Safety Council's Safety+ Health magazine, the most common cause of arc flash accidents is human error. This is a hard fact to swallow considering the investment of time to train a qualified electrical worker is significant.

But, an employee's experience on the job with electrical system maintenance doesn't matter when that employee is distracted while performing energized work. Carelessness is often credited as the cause of arc flash and other electrical accidents, but no matter how well a qualified worker is trained, he or she will always face distractions. He will experience weariness. She will feel the pressure to restore power. And, he may experience overconfidence due to the sheer fact that he's undertaken this activity hundreds, if not thousands of times before without issue. Another factor related to experience is when the electrical worker may not be qualified to work on all types of equipment. This is especially a concern when a mix of legacy equipment exists within the a plant and there are a number of different equipment manufacturers. Any of these things may cause an electrical worker to unwittingly

circumvent the safety procedures, or work unprotected, or drop a tool, or accidentally make contact between two energized conductors.

An outdated, under-emphasized or ill-communicated electrical safety program is a financial disaster waiting to happen. Add to that, a workforce not rigorously trained in electrical safety may be missing out on the proper safety mindset. Workers will not follow regulations if they can't comprehend the benefits and how to apply them to their daily situations. The mitigation of electrical hazards and the need for employers to meet compliance with the minimum safety requirements in consensus standards in an effort to protect workers and property is the primary means of reducing serious financial risks.

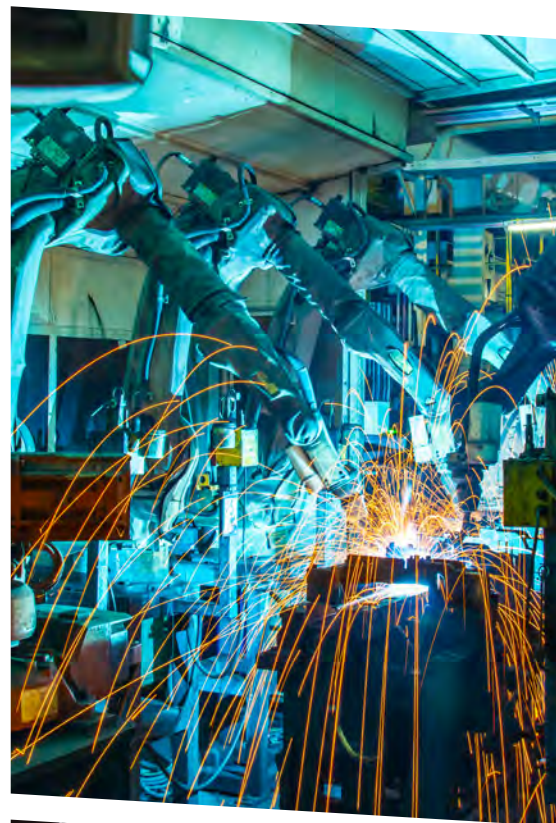
The Total Costs of an Arc Flash

In general, all electrical incidents can be costly, so electrical safety is truly more than just arc flash prevention. But, as a common topic with prominent attention in plants worldwide, an arc flash is a significant event. It occurs when an electric current passes through the air instead of along its intended path. This results in a massive explosion of extremely high heat that can cause severe burns, create a blinding light, and can result in bodily harm and potentially fatal injury. Every day, multiple arc flash incidents occur in workplaces throughout the world. As you might imagine, this type of hazard is not only a terrifying experience for the workforce, but it's a frightening financial situation for everyone involved.

One of the most critical things a company needs to understand about an arc flash incident, in addition to the danger it poses to the worker, is how much an arc flash will potentially cost the business.

The risk of an arc flash event at your company is far from trivial. For some facilities, an increase in electricity usage combined with an aging electrical infrastructure increases the risk. The Electrical Power Research Institute (EPRI) estimates direct and indirect costs stemming from a fatal electrical accident to be in the millions of dollars. Direct costs include workers' compensation payments, coverage for medical expenses, as well as legal expenses. Additionally, and eventually, insurance expense coverage can be affected if the safety record of the facility declines or worsens. Indirect costs are usually uninsured and can include damage to the property, cost to repair the affected area, and loss of productivity due to worker time off as well as hiring and training the replacement. Disruptions to normal work procedures, manufacturing downtime and drops in production will create inconsistencies for the facility and the ripple effect is likely to negatively impact the overall health of the company. If the incident is significant, and the costs aren't able to be adequately covered, then the company may even be forced to delay the purchase of new equipment, causing even further delays at the facility.

Assuredly, if an arc flash event has occurred, then steep fines due to workplace safety violations will be included if proper electrical safety



procedures were not present. While there may be several indirect and hidden costs due to arc flash accidents, conversely, there are hidden savings in accident prevention.

In the end, smart safety management teams will continue to enforce compliance for their facilities. Today's standards already require electrical hazards to be identified and risk assessments that need to be performed. The costs of an electrical accident may vary, but the cost of just one electrical shock, arc flash, arc blast, or fire accident typically outweighs the cost to mitigate or prevent the accident in the first place. Investing in Prevention through Design is an effective and reliable method of protecting workers from electrical hazards. Thinking about safety in the design phase for all tasks that occur through the lifecycle of a product can be more easily (and often more economically) addressed by design solutions rather than relying on administrative controls like warnings, labels, training, written procedures, and PPE.

Reducing financial risks often means going beyond compliance, embracing innovations and new technologies, and even upgrading current safety programs. It's possible that inspections may actually help expose issues and even create new value. A 2012 study surveyed over 800 California companies where all were eligible for inspection by OSHA but only half had been. The companies receiving an inspection saw a decline of 9.4% in injuries and the average company saved \$350,000 over the five years after the OSHA visit. OSHA requires companies to operate safely, but it's smart to be proactive - to look for areas where safety can be improved, even before signs of an incident are evident and especially where near-misses are a frequent occurrence.

When thinking about risk reduction and financial savings, remember the premium. The big reason a plant might see high insurance premiums is largely because of previous losses. With a strong safety culture in place, that same plant might have fewer losses. By communicating preventive safety measures to employees, the business can save on insurance premiums by talking up the safety program. A good insurance agent will work to help the business save by identifying and offering industry-specific safety programs that might meet that business' needs. It's possible the agent assists with insurance credits for a strong safety program.

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OVER THE FIVE YEARS
AFTER THE OSHA VISIT.

Quick Tips to Reduce the Financial Risk

Even trained experts can experience accidents, but a well-informed safety management team can be a big asset to the company by keeping the investment in electrical safety a top priority.

- 1 Think about integrating technology that will minimize the chance for human error.** Will new permanently-installed test equipment upgrade the plant's ability to create an electrically safe work condition?
- 2 Think about user adoption.** Can qualified electrical workers be better trained? What tools and equipment will create better efficiency so they're put in a safer environment?
- 3 Think about the current safety processes the facility employs today.** Where can improvements be made that will make compliance with standards even easier?

Reducing Risk Requires Communication and Constant Safety Program Improvements

Conscientious safety programs should be actively expanding the company's electrical safety program. This will conclusively include electrical safety training and very likely an arc flash study. A typical output or deliverable from an arc flash study is the mitigation recommendation, which focuses on reducing high risk on frequently accessed equipment. A company can also minimize the risk and severity of a growing hazard by conducting arc flash hazard assessments and implementing the latest technologies in electrical safety. There is also a Prevention through Design approach that can help eliminate a worker's direct exposure to electricity.

We can theorize that there are two basic sides to safety program improvements: the cultural side and the physical systems side. While both sides are interwoven, as the cultural side includes training, work practices, and other safety procedures; the systems side includes the physical interaction with lockout/tagout devices, personal protective equipment, and products that emphasize Prevention through Design concepts such as absence of voltage testers. Voltage indicators will warn of hazardous voltage, but they cannot be used to confirm if equipment is de-energized. Absence of voltage testers are permanently-mounted testers designed to verify that a circuit is de-energized prior to opening an electrical enclosure containing electrical conductors and circuit parts. In any factory, every piece of equipment requires proper training before it is ever used; similarly, the company and every affected employee benefits from investing in safety training and safety practice.

The VeriSafe™ Absence of Voltage tester from Panduit is one example of how the Prevention through Design approach can be used to update electrical safety programs. Nearly all electrical work requires an electrically safe work condition to be established, and a key element of that process is verifying the absence of voltage exists. The AVT simplifies this task by automating the test sequence and allows the status of voltage to be determined inside the equipment before doors or covers are removed. This reduces the risk of exposure to electrical hazards and increases the likelihood that the process of verifying absence of voltage is performed, resulting in improved worker safety.

So, if an arc flash incident costs upwards of \$10 million, and human error is to blame, then it's clear that continuous improvement must be a goal of every facility manager. Failure to keep a safety-conscious plant not only harms people, but it harms the bottom line.

How to Reposition Safety as an Investment

Investing in your company's health and safety comes with a price. But, in terms of an investment, the returns are found in the absence of incident. With a strong safety program in place, insurance premium reductions may

Return on Investment

Polled executives revealed data that shows \$3 or more is saved for each \$1 invested in workplace safety.

—The American Society of Safety Engineers (ASSE) and Liberty Mutual

\$4 to \$6 can be found with every dollar invested in workplace safety.

—OSHA



pay back year over year as safety records keep improving.

Preventing workplace accidents, injuries, and deaths is everyone's business. Despite some notable improvements in workplace incident rates, fatalities still occur frequently, with over 4,300 workplace deaths reported in 2012, according to the Electrical Safety Foundation International (ESFI). Between 1992 and 2010, an average of 268 people annually died on the job from electrocution. Thousands more suffered injuries such as shocks and burns from electrical accidents.

Throughout the facility, investments that minimize risk will help to capitalize on saving money—and lives. To protect the worker during an absence of voltage test, the VeriSafe Absence of Voltage Tester automates the test sequence to help reduce the chance for human error. A built-in test circuit verifies operation on a known voltage source before and after the absence of voltage test for both AC and DC. As a permanently installed device, VeriSafe ensures the tester is rated for the application and is less susceptible to damage than portable hand-held testers. The benefit of the investment here is one that increases the safety while simultaneously increasing worker productivity.

About the VeriSafe Absence of Voltage Tester

- Reduces the risk of exposure of electrical hazards for improved worker safety
- Reduces testing procedure time and complexity to improve productivity
- Supports compliance when used as part of the lockout/tagout process described in NFPA 70E





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