

CONVINCING THE CRAFTSMAN – A STUDY OF WHAT WORKS AND WHAT DOESN'T WITH RESPECT TO EDUCATING THE ELECTRICAL WORKER ABOUT ELECTRICAL SAFETY

Copyright Material IEEE
Paper No. ESW-11

Wes Mozley, CMRP
Sandia National Laboratories
P. O. Box 1515 MS 0907
Albuquerque, NM 87185
wrmozle@sandia.gov

Abstract – It is one thing for an employer to implement an electrical safety program. It is another thing entirely to obtain full craft-level buy-in and compliance and to accomplish “the required self-discipline for all employees who must perform work that may involve electrical hazards”. This paper discusses some of the obstacles that are faced by companies and contractors as they progress on their electrical safety journey. The paper discusses approaches that have succeeded and approaches that have failed. It also emphasizes the need for management to believe in and understand what they are saying and requiring with respect to electrical safety so they can effectively communicate the why of the requirements to the craftsmen in the field.

Index Terms — electrical safety program, management commitment, cost,.

I. INTRODUCTION

While many large industries and industrial contractors have embraced the NFPA 70E, CSA Z462, OSHA and other standards, and implemented robust electrical safety programs, there is still an enormous segment of the electrical industry and industry in general that has not started down the safety path. Even companies with vigorous safety programs may still meet with pockets of resistance to some of the requirements as a result of experienced craftsmen who come from an era where energized work was the norm and expected, the general machismo present in the electrical industry, or a basic lack of understanding of the rationale behind the requirements.

As companies incorporate NFPA 70E and other electrical safety guidelines it can be frustrating to find that their electrical craftsmen are resistant to changes related to adoption of an electrical safety program. Why wouldn't the electrician be pleased about the new focus on safety? After all, this is in their best interest and for their own good. Over 35 years of observing corporations and contractors implement, or attempt to implement, safety changes has led this author to several observations.

II. COMPANY AND MANAGEMENT RELATED ISSUES

Many companies have some semblance of a safety program.

The program may or may not have been adequate, it may or may not have been fully supported by management, it may or may not have been sufficiently funded, or there may have been other impediments to the development and implementation of a robust program. In some instances, there may never have been any formal or documented safety program at all. With great fanfare, a new standards-based electrical safety program is being rolled out and is being met with less than enthusiastic response. It is frequently not well understood by those in positions of authority that the less than enthusiastic response to the new program is far less about the program itself but far more about the history of past efforts, the safety record of the company in general, and the attitude with which the program is rolled out. We will explore some of the management-related concerns and how to address them.

A. Existing Safety Culture

The fact that a company is implementing a new safety program, or adding elements to an existing one, is indicative of inadequacy or failures of previous endeavors. In many cases, the employees were already aware of the shortcomings in the existing program and are relieved that management is finally becoming aware of them as well. It is important for management to make a genuine effort to understand their role in the failure of past attempts at safety programs. All too often, management acts like the great and wonderful, all-knowing savior of the world when they roll out another safety program. The craft already understand that the last program was a failure. If management pretends it wasn't, or can't admit their role in the failure of it, respect is lost and any attempts at new programs will be met with diminished respect.

The inability of management to admit to the shortcomings of the past or the inability to admit that they may have been wrong, is detrimental to the success of a new program from the start.

In many companies, there is an overt inattention to safety. Management tells the craft, “You be safe out there,” and feels they have done their due diligence. Now if someone gets hurt, it can't be management's fault because they told you to be safe. It must have been your fault for doing something unsafe. When management puts all the responsibility for safety on the craft but does not train them or provide them with the tools and equipment they need to implement safety, that is a management failure. Yet all too often this is the extent of the safety program. In many cases, craft are asking for more safety in terms of equipment or training and are told, “You don't need that.” They end up feeling

disrespected, unappreciated, and undervalued. The hard feelings caused by this disregard for the craft make it all the more difficult to implement a program when management does get serious about electrical safety.

B. Cost

There are times when we look at the history of safety program failures in a company where cost has been an overriding factor. "You want me to buy you a what? Do you have any idea how much that costs?" Far too many companies worry about the cost of implementing safety measures when the question that should be asked is: "What is the potential cost of not doing so?" A company is starting to get to the right place in the development and implementation of a safety program when the focus on cost shifts to a focus on ensuring that everyone goes home safely at night and there are no injuries that could cost the company thousands or millions of dollars rather than concern over the cost of safety equipment and training.

If concerns about the cost of safety have been an overriding factor in the history of a company, expect some skepticism on the part of the workforce when anything new is presented. Once again, management will need to admit to the shortcomings of the past and be willing to prove that they will fully adopt, support, and adhere to the new program. It is also important to understand the costs of the implementation up front and prepare for them because the first time cost gets mentioned to an employee as a reason for holding back on a piece of safety equipment, the craft will go back to square one in their trust in the program.

C. Flavor of the Month

Attempted implementation of poorly thought out or poorly implemented safety programs can lead to "flavor-of-the-month" syndrome. This can often occur when companies rely on third parties for safety programs. One year employees get a preprinted "safety note" in an envelope with their paychecks – frequently something that has absolutely no application to what it is they do on the job. The next year, a different safety poster appears on the bulletin board at the shop each month. The following year a safety "expert" is brought in to explain the canned program just purchased by the company.

Each attempt at a safety program, no matter how well intentioned, leads to a rolling of the eyes and the question, "What is it this time?" among the craft. A sure-fire indication of a new flavor-of-the-month program are the words "This is not another flavor-of-the-month" at the beginning of the presentation of the newest iteration of the safety program.

When it comes time to implement a real standard-based safety program, care needs to be taken to assure that it is well thought out and complete, that management can and will stand behind it for the long term, and absolutely commit to the training and costs required to implement the program. Otherwise, it will be a failure and relegated to the flavor-of-the-month trash heap.

D. Lack of Management Commitment

Lack of management commitment can be one of two forms. The first is a true lack of commitment. It occurs when a company makes an edict that "henceforth there will be no energized work performed by anyone at this company," and makes a big production of rolling out that concept, then turns around and tells

the craft "Do whatever you need to do to get this job done quickly."

While not openly stated, the definite implication is that management continues to expect energized work while officially being on the record as not doing so. Frequently this is done because management understands how electrical safety is beginning to be viewed by others, but they are not willing to make the financial and other commitments to truly implement a safety program. They are hoping to have it both ways. They want to be in the position to feign horror and dismay when an employee is injured in an electrical event. They will point to the explicit statement that nothing is to be worked energized, while ignoring the repeated implicit demands for employees to continue to work energized because of the belief that it saves the company time and money. The safety program in this form was never intended to succeed, but to only serve as a shield for the company in the event there was an injury. Meanwhile, if there ever is a bona fide attempt to implement a genuine safety program the company will have huge credibility obstacles to overcome.

The second form of lack of management commitment occurs when management does not fully understand the significance of what they are undertaking when implementing a safety program. They think they know what they are signing up for, but when the reality of implementation hits they are unprepared and they waver. It is imperative that management go into a new electrical safety program with eyes wide open as to costs and training requirements. It must be understood that field work will no longer be "business as usual," but will involve different work methods.

Just as the NFPA 70E requires that the electrical safety "program shall be developed to provide the required self-discipline for all employees who must perform work that may involve electrical hazards",^[1] the employer must have the necessary self-discipline to stay the course and not falter at the enormity of the task. At the first sign of hesitation, employees will lose all confidence in management and the program.

It is imperative that management understands the enormity of the undertaking when implementing a safety program and not succumb to the temptation to revert to old habits in the interest of expedience or convenience once the program has been introduced. In addition to instructing the craft about the new expectations, management must also model the behaviors they expect the craft to embrace. Nothing shows a lack of commitment like a supervisor showing up on a jobsite without a hard hat and safety shoes when everybody else is expected to be wearing them. When management sets the example by modeling safety behaviors, the craft is going to be much more likely to follow suit.

E. Suspicions as to Why the Electrical Safety Program is Being Implemented

There are times when safety programs are implemented as a direct result of an employee injury on the job, a finding from a regulatory body, or a significant insurance rate hike. Frequently, employees are all too aware of the precipitating event that results in the sudden desire on the part of the company to develop a safety program and put it into practice. They know it's not because of a sudden genuine concern for their safety, but more of an effort to mitigate a regulatory finding or lower an insurance rate.

When a company is faced with implementing a safety plan under these circumstances, it is especially important that the

company grasps the concept that the safety program has to be about people and that their concern has to be primarily about their employees and not about the company. Whatever the event that triggered the company's understanding that a safety plan needed to be established and executed, until there is a full understanding that safety is all about the employee and not about the company, there will be impediments to the full acceptance of the safety program by the craft.

It is wise in these instances for the company not only to be honest about the event that prompted the sudden attention to safety, but also to emphasize that the event has provided them with new insight as to why the safety of their employees is so important. The company needs to make certain that overall employee well-being is paramount with respect to the implementation of the new safety program and communicate that convincingly.

III. CRAFT-RELATED ISSUES

When the implementation of a new standard-based safety program is being met with craft resistance, it is easy for a company to blame the inflexibility and stubbornness of the craft. It is difficult to look in a mirror and see where the company has been at fault in creating this negative attitude. It is important that the company admit the past, admit their responsibility for the previously unsafe environment, and admit where they were wrong. A genuine and heartfelt admission of previous shortcomings will go a long way toward repairing relationships with the craft and opening them to the acceptance of the safety program.

A. *A History of Working Energized*

Unfortunately, there will still be resistance to the level of change that is required for a robust standard-compliant safety program to be implemented. It is important to remember that electricians have been trained for generations to perform energized work, and the ability to "safely work it hot" is a point of pride among many electrical workers. There is a tremendous amount of machismo in the industry and it is imperative that the skills and expertise of the journeyman be recognized with emphasis placed on the fact that not working energized does not make one less of a craftsman.

It is also important here for the company to recognize and admit their complicity in a system that demanded energized work. Entire generations of apprentices were trained in trade schools or contractor supported apprenticeship programs that working energized was the norm and expected. Suddenly they are being told, many times by the same people who only recently were expecting them to perform work energized, that energized work is no longer acceptable. It can be very difficult for the individual to accept that one of the significant points of pride for an electrical worker is no longer permitted on the jobsite. Significant strides will be made when the company can turn the pride of the ability to work energized into the self-satisfaction of knowing one is working to a higher level of safety.

B. *Changing the Concept of What is Acceptable*

Helping the craft understand the 'why' behind the requirements will help in this regard. It is one thing to present the NFPA 70E, CSA Z462, or other standard as a set of rules – thou shalt and

thou shalt not in this brave new safety world - but it is another thing entirely to help the craft see these standards not as a set of rules, but as a framework that allows them the opportunity to be safer on the job.

Communication is key in this regard. It takes time and effort to realign thinking. For years it has been an accepted fact in the electrical industry that people get injured and people get killed. One always hopes that it is not oneself that is involved in an electrical event, but when we hear a story about someone who has been injured or killed as a result of an electrical incident the response is usually something to the effect of, "Poor guy, poor family," and then it's back to business as usual because it is an accepted fact that people get injured and killed in this industry.

What people need to be helped to understand is that the NFPA 70E, CSA Z462, and other standards are telling us that it is not acceptable for people to be injured or killed in this industry. That is a significant thought process change and it takes some time to completely wrap one's mind around that after years of being taught that energized work is acceptable and even expected.

C. *Filling in the Educational Gaps*

In this author's experience, the one thing that has had the greatest impact with regard to changing the attitude of the electrical worker toward safety is to educate the individual as to the nature of electrical injuries and the reality that they can happen to anybody. It is only in the past few years that apprenticeship programs and trade schools have been introducing the NFPA 70E and other safety standards into their training programs. Safety, as we know it today, was not a focus during the formative years of many of the workers in the electrical field. These gaps in the worker's education are best filled in with training rather than edicts.

One of the most significant training gaps with respect to helping electrical workers understand why it is in their best interest to not perform energized work is a lack of education of the nature and severity of injuries that result from exposure to electrical energy.

People have some concept of what constitutes a burn and the fact that an arc-flash or arc-blast incident can cause that type of injury, but they still don't believe that it is going to happen to them. Case studies, articles from industry publications, and especially videos featuring people who have been involved in these types of incidents bring the reality of these types of serious incidents home and get the worker to thinking about the fact that it could happen to him.

While people have a general understanding of burns, far fewer people are educated as to the long-term effect of electrical shock on the human body. To this day, most electricians look at electrical shock as an unpleasant but acceptable consequence of the nature of the work that they perform. They "shake it off" and try to avoid the next one. They have been shocked and survived, so the tendency is to forget that an electrical shock can kill.

It is important to share the information available from leading experts on electrical shock with individuals in the industry. It is important for the craft to understand that electrical shock can have cumulative, lasting effects and the damage that can be done to their bodies over time as a result of the cumulative effect of electrical shock. In the experience of this author, education of this nature does far more toward changing the attitude of craftsmen with respect to acceptability of electrical shock than all the edicts from management and safety programs in the world.

D. Letting the Craft take the Lead

While it is ultimately the responsibility of the employer to “provide the safety related work practices” [2] there is a lot to be said for listening to craft input. Nobody knows their job better than they do. While there may be some gaps in their safety education, they most likely have been approaching management for years with ideas about how to improve safety. If they haven't been, it is probably because they feel like they aren't being listened to. The development phase of the safety program is the ideal point at which to involve the craft. They may bring fresh ideas to the table that management hasn't thought of and the collaborative effort frequently results in a better product.

Involving the electrical workers in the development phase also permits them to learn about NFPA 70E, CSA Z462, OSHA, and other standards and gain a better understanding of the standards. Additionally, it allows for exposure to concepts that may be new to them, such as no longer performing energized work, prior to the program being implemented. Participation in the process also gives the craft an ownership stake in the process, thereby making acceptance of the final product much more likely and resistance less likely to be as significant an issue.

IV. CONCLUSION

Implementation of an electrical safety program can be fraught with obstacles, not the least of which is opposition from the craftsman to the changes brought about by the electrical safety program. Skepticism on the part of the electrician as to the seriousness of the intent of the company must be met with an honest admission from the company that there have been shortcomings in the past in order for the company to demonstrate their sincerity in establishing a new safety norm. Additionally, education of the electrical worker with the most current information on arc and shock injuries and helping them understand the long-term negative effects of both these types of injuries will go a long way in establishing support for and acceptance of the electrical safety program.

V. ACKNOWLEDGEMENTS

The author gratefully acknowledges Emily Kowalchuk and Rodrigo Llanes for their critical reading and comments on this paper.

VI. REFERENCES

- [1] NFPA 2015 *Standard for Electrical Safety in the Workplace*, Quincy, MA: NFPA 70E
- [2] NFPA 2015 *Standard for Electrical Safety in the Workplace*, Quincy, MA: NFPA 70E

VII. VITA

Wes Mozley is an electrical engineer responsible for the implementation of the Arc Flash Program at Sandia National Laboratories in Albuquerque, New Mexico, where she has worked for over 37 years. Originally an electrician by trade, Wes

worked primarily in industrial maintenance and construction in both high and low voltage applications. In addition to carrying tools for many years, she has worked as a supervisor, inspector, designer, contract manager, quality engineer and maintenance engineer. Wes taught in the Electrical Trades department of Central New Mexico Community College for over 35 years. Wes also runs her own consulting firm providing electrical safety, maintenance, and forensic consulting, safety and electrical training, and continuing education.

