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70E "What is all the fuss about?"

The National Fire Protection Association's 70E Standard for Electrical Safety in the Workplace is causing quite a storm in industry. From the same people that bring you a new version of the National Electrical Code every three years, 70E has a lot of people asking questions like: "What is it?", "Does it apply to us?", "Does OSHA require it?", "Can we be fined for not doing it?". Some of these questions are easily answered-- others are more difficult.

The national discourse on 70E is pushed into a gray area by comments made by OSHA leadership. From comments like "OSHA doesn't require NFPA 70E per se," to an OSHA director going as far as saying if he were an employer and wanted to protect his employees from electrical hazards, he would certainly "turn to NFPA 70E." However, if you read between the lines it appears more black and white.

Years ago, OSHA realized that national consensus standards producing organizations like NFPA were quite good at the process of developing standards for specific hazards and it was unwise for OSHA to reinvent the wheel. Why not rely on these existing organizations to develop the standards and OSHA will use them where applicable. In the mid seventies, OSHA approached NFPA and asked them to create a standard to protect workers from electrical hazards in the workplace. Thus the NFPA 70E was born; OSHA used it to create much of its 1910 Subpart S and 1926 Subpart K standards. Through this collaboration, elec-

trical safety in the workplace was improved; many lives were saved and many accidents were averted.

Although it has been a while since OSHA adopted all of the changes in the newer editions, there have been several updates since NFPA 70E was first created. The latest edition, 70E 2004, has in it many requirements that, quite frankly, only a small percentage of facilities in this country have put into practice.

The dilemma is centered on the vagueness of OSHA standards involving electrical safety. OSHA says an employer must protect workers from electrical hazards and that employees must wear personal protective equipment (PPE) to protect themselves. This can be quite complicated; they do not tell you how this should be done. 70E explains for you how to accomplish both of these OSHA requirements. I believe the combination of OSHA's intentional vagueness and their reliance on other organizations for detail makes the process effective. Although, in situations like we find ourselves today, where the NFPA standard has been updated but not fully written into the OSHA code, it can become a confusing environment for the employer to provide a safe and OSHA compliant workplace.

I travel the country speaking to upper management and electrical personnel of large and small organizations regarding the implementation of 70E. Some of the requirements of 70E that are causing the most angst in industry among those companies implementing the standard are: energized work permits, putting panels in an electrically safe condition, written electrical safety programs, Arc Flash, PPE requirements, training requirements, outside contractors, and approach boundaries. If these terms sound foreign, it is time you learned more about 70E.

Of these concerns, none cause more confusion than Arc Flash. In some organizations it is believed that 70E associates itself with Arc Flash and nothing more. This assumption is wrong. Arc Flash hazards, which are a small part of the standard, are hazards created when electrical energy is released in the form of heat and pressure. It can be caused by a myriad of problems, some as simple as the dropping of a wrench into a live panel. Others can have causes such as an internal failure in a fuse or circuit breaker. The energy released can cause a small spark or a potentially fatal explosion created by massive amounts of electrical current flowing through superheated air. As I speak to groups, I always ask who in the room has witnessed or been a victim of an Arc Flash. In every group a large number of students raise their hands; when they are asked to tell their stories, it is obvious that they have become believers in the power of Arc Flash and its ability to cause injury. In every case, it was an eye opening experience that gave birth to a new respect for electricity—an awareness of the fact that the electricity can not only shock you, but it can also cause a potentially fatal injury due to exposure to the heat and explosive properties of an Arc Flash. Fortunately, we do not have to rely on our workers experiencing a near miss or witnessing an Arc Flash accident to make them aware of this hazard. We can rely on 70E to do it for us.

An electrical engineering study done of your facility called an Arc Flash Hazard Analysis is required to protect your employees from Arc Flash. This study will determine the hazards of each point in your facility where live electrical conductors might become exposed by the opening of electrical enclosures. Simply put, the engineers will calculate the temperature of the energy release and how long it will last. The three determining factors of the extent of an Arc Flash injury are temperature, distance, and time. Using the results of the study it can be determined what type of PPE is required at the location and at what distance to the

exposed live parts must it be worn. The study will identify those areas of greatest hazard, and make recommendations to reduce those hazards through modifications in your over-current protective equipment, current limiting fuses, adjustable breakers, etc.

As a former electrician in industry, I understand the changes that 70E will bring to the way electrical personnel do their job. One example of such a change is the push to eliminate working on exposed energized equipment. This is strongly discouraged, unless de-energizing the equipment introduces additional hazards or is infeasible.

If you are unable to put the equipment in an electrically safe condition due to the exceptions allowed, then you must obtain an energized work permit, perform a shock hazard analysis of the equipment, determine appropriate PPE and insulated tools that are required for shock protection, determine the shock protection boundaries, perform an arc flash hazard analysis, determine appropriate PPE required for arc flash protection, determine flash protection boundaries, and notify anyone in the area of your work. These tasks have been simplified, but represent some of the changes in behavior that are required.

These new requirements will be quite foreign to some electrical personnel, and it is these people that will undergo the greatest change in their behavior. 70E should be looked at as just that, a behavior change. It must start at the top of your organization, because everyone needs to realize it is no longer business as usual.

Article by:

Daryn Lewellyn

President/Founder

Lewellyn Technology, Inc.

darynl@lewellyn.com

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