



Safety Measures ^{ELECTRICAL}

“Elimination is the first priority!
Ensure a risk assessment is completed before energized work tasks are completed.”

Electrical Safety Program: Mistakes & PPE Updates

By Terry Becker, P.Eng., CEMCP, IEEE Senior Member

The CSA Z462 Workplace electrical safety Standard requires that an employer reviews and updates their company’s Electrical Safety Program at a regular frequency not to exceed three years (e.g., CSA Z462, Clause 4.1.7.1). This aligns with the three-year revision cycle of CSA Z462 which published its 5th Edition in January. The Electrical Safety Program should be dynamically reviewed to ensure it aligns with any OH&S Regulatory updates, new requirements of CSA Z462 or related Standards and correction of mistakes or misinterpretation as required following a continuous improvement philosophy,

PLAN-DO-CHECK-ACT. This is aligned with the CSA Z45001 Occupational health and safety management systems – Requirements and guidance for use. Reference Annex A Aligning Implementation of this Standard with CSA Z45001 in CSA Z462.

When I work with an employer to develop an Electrical Safety Program, I use a defined Project Execution Plan with four defined project Phases. Phase 4 involves transitioning the Electrical Safety Program (ESP) into field application, communication with stakeholders, roll out orientation training,

soliciting user feedback (e.g., Frequently Asked Questions), and monitoring and reviewing the field application for sustainable performance. Managing any ESP updates and related changes to it is required following a formal Management of Change (MOC) process.

Over the last ten years I have identified many myths and misinformation that have led to employers making mistakes with respect to their Electrical Safety Programs. Here are the top five mistakes made:

1. The employer has not developed and implemented an Electrical Safety Program at all or the document that has been created and implemented is not compliant to the requirements of CSA Z462 and CSA Z45001.
2. Wrongly believing that it is against the law to have Qualified Electrical Workers perform energized electrical work tasks. Workers will lose confidence and refuse to complete energized electrical work tasks.
3. The employer solicited an Arc Flash Hazard Incident Energy Analysis Study. The P.Eng. authenticated report issued includes errors, omissions and misinformation that is misinterpreted by the client, potentially debilitating the employer from operating and maintaining its facility. Specifically, 40 cal/cm² of incident energy is wrongly communicated as “Dangerous” and “No PPE Exists.”
4. Not validating that the arc flash & shock training the employer is providing to Qualified Electrical Workers is compliant and defensible if an electrical incident were ever to occur. The employer should pre-qualify the service provider and specifically that the instructor is a CSA Z462 subject matter expert.
5. The employer has not included and documented a defined Risk Assessment Procedure in their Electrical Safety Program completing formal qualitative work task-based risk assessments to define the appropriate hierarchy or risk control methods required to be implemented by Qualified Electrical Workers in the field. Additionally, the employer has not included an Energized Electrical Job Safety Planning form as a component of the Electrical Safety Program that will be used in the field by the Qualified Electrical Worker confirming they have applied the required hierarchy or risk control methods in the field to achieve a residual risk level that is as low as reasonably practicable.

There are many more mistakes unfortunately that employers have made based on myths and misinformation that have propagated over the last 10 years across Canada. Employers need to validate their due diligence, complete electrical safety audits, pre-qualify training companies and consultants and ask for credible and defensible substantiation when advised of specific policies, practices or procedural requirements.

PPE Updates

It is important that an employer monitor innovations and changes related to arc flash & shock PPE, tools & equipment in

the ongoing field application of their Electrical Safety Program. The Electrical Safety Program includes a defined Risk Assessment Procedure, Job and discrete work task based. The Risk Assessment Procedure evaluates the potential injury or damage to health related to arc flash & shock hazard exposure and the likelihood of occurrence of worker exposure for discrete energized electrical work tasks they perform (e.g., reference CSA Z462 Table 2 Estimate of the likelihood of occurrence of an arc flash incident for ac and dc systems).

With respect to arc flash & shock PPE, tools & equipment, significant improvements have been made and there are new arc flash & shock PPE, tools & equipment available that will eliminate, or reduce the likelihood of, occurrence of exposure. Procurement of new arc flash & shock PPE, tools & equipment needs to be budgeted for by an employer. I wanted to highlight some of the innovations and new arc flash & shock PPE, tools & equipment that will have a positive impact.



NASCO Protective Outwear Solutions, Petrolite 9000 Series combined chemical and ATPV rated two piece suit – Chemical protection and an ATPV of 9.1 cal/cm². This dual rated bib-overall and jacket solution provides both chemical and arc flash protection for a Qualified Electrical Worker.



Xtend-a-Rack, extendable manual racking tool for power circuit breakers – This new product recently released by Amidyne Solutions moves the Qualified Electrical Worker up to 208 inches or approximately 17 feet away from the front of a power circuit breaker when it is racked in or out, eliminating exposure to arc flash or reducing the ATPV of ac flash PPE required.



Oberon Company True Color Grey lens technology – Jack Hirshman the CEO of Oberon Company has been innovating in arc flash PPE since he created the company. Oberon Company was the first North American company to invent and bring near clear arc-rated polycarbonate lens technology for arc flash suit hoods and arc-rated face shields.

This lens technology doesn't discolour wires and allows almost 100% visual light transmission for the Qualified Electrical Worker which reduces likelihood of occurrence of an electrical incident.

Arc Flash Suit Coat



Side View

- Extends 10' from the back of the coat.
- Open end can be tied into a loop.
- Strap can be extended if necessary.



Oberon Company "Escape Strap" – This new enhancement was released in 2020, first for arc flash suit jackets and then a new arc-rated vest adaption to be worn on top of everyday/task wear arc flash PPE. This allows for an Electrical Safe Watch

to easily move the primary Qualified Electrical Worker away from energized electrical equipment if an electrical incident occurs. This eliminates the need for a rescue hot stick.

Fluke SureGrip Kit with Probe Light and Probe Extenders – This product has been available from Fluke for several years, but you most likely are not aware that it was available. These probe extenders are approximately 13 inches in length and remove the Qualified Electrical Workers hands from the box eliminating inadvertent movement risk and the likelihood of loose wire been removed by the hands.



If you are interested in discussing the information presented in this article do not hesitate to contact me at terry.becker@twbesc.ca or 587.433.3777, I can substantiate the information presented. My goal is to ensure that employers can interpret and apply the CSA Z462 Workplace electrical safety standard with a practical and reasonable approach and defensible due diligence.



Terry Becker, P.Eng, CESC, IEEE Senior Member is the first past Vice-Chair of the CSA Z462 Workplace electrical safety Standard Technical Committee and currently a Voting Member and Working Group Leader for Clause 4.1 and the Annexes. Terry is also a Voting Member on the CSA Z463 Maintenance of electrical

systems Standard and a Voting Member of the IEEE 1584 Guide for Performing Arc-Flash Hazard Calculations. Terry has presented at Conferences and Workshops on electrical safety in Canada, the USA, India and Australia. Terry is a Professional Engineer in the Provinces of BC, AB, SK, MN and ON. Terry is an Electrical Safety Specialist, Management Consultant, and can be reached at 587.433.3777 or by email terry.becker@twbesc.ca.

Electrical Line

m a a z i n e

Have you **RENEWED** your **COMPLIMENTARY** subscription?

Has your address changed? Make sure there will be no interruptions to the delivery of your magazine and e-mail your change of address to info@electricalline.com.

If you are not getting your own copy of Electrical Line Magazine, go to electricalline.com/subscribe and **SUBSCRIBE TODAY!**