



Safety Measures ELECTRICAL

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

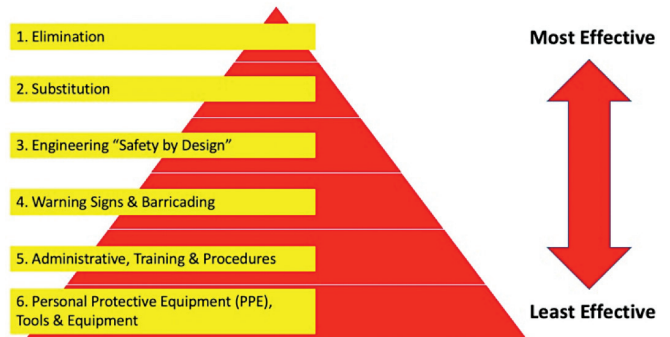
CSA Z462 2021 Edition – Year 2

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

It is the first anniversary of the 5th Edition of the CSA Z462 Workplace electrical safety Standard. Ensuring you are aware of and follow up on the latest Edition of CSA Z462 is important for maintaining your due diligence, measuring performance of established policies, practices, and procedures, looking for opportunities for improvement (e.g. PLAN-DO-CHECK-ACT) and is a mandatory requirement of CSA Z462 Clause 4.1.7.12 Auditing.

Both 2020 and 2021 have been challenging years for us all, but it is important to ensure that we continue our journey and mission in eliminating exposure to electrical hazards and implementing the hierarchy or risk control methods to reduce risk to as low as reasonably practical. We need to “Get it Right!”

I thought I would use the first Electrical Safety Measures article in 2022 to provide a “year in review.” I will highlight



Hierarchy or Risk Control Methods

what I see and hear and experience when working with industry to interpret and apply CSA Z462 while developing and

implementing a compliant Electrical Safety Program, when completing External Electrical Safety Audits and when providing arc flash & shock training.

Myths & Misinformation

Throughout 2021 I was confronted again with answering questions with respect to the following questions or comments:

1. Is it against the law to perform energized electrical work?
2. We have a policy and we do not perform “live” work?
3. I will not execute a work task when the incident energy is greater than 40.0 cal/cm² it is “Dangerous,” too high risk to complete that work task.
4. Arc flash PPE is specified with an Arc flash PPE category #.
5. Arc flash hazard incident energy analysis reports are still issued by P.Eng. Electrical Engineers with misinformation; there is a lack of documenting the basis of the analysis performed; they are conservative or have incorrect parameter selection; and example arc flash & shock equipment labels provided that are not compliant to CSA Z462 and ANSI Z535.
6. Do we need full body arc flash PPE to operating energized electrical equipment?

The saying is – *knowledge is power!* We need to ensure that compliant Electrical Safety Programs are developed, implemented, and audited. This will ensure myths and misinformation are effectively managed and answers provided through the Electrical Safety Program about using the tools within it (e.g. risk assessment procedure).

Electric Shock Sequela

In 2021, I continued to dialogue and follow up with John Knoll from Edmonton on electrical shock sequelae. John is a Journeyman Electrician, a CME, and PEC (Professional Electrical Contractor) now retired due to electrical shock sequelae, which is the potential long term physiological, neurological, and physical effects of receiving multiple electrical shocks while working. John is now a subject matter expert

and spokesperson advocating that we need to address the electric shock hazard in the workplace so that workers do not receive shocks at all for the potential fatal immediate effects and the potential long-term effects of electric shock sequelae. I have commented many times that we all need to change the narrative from arc flash to ensuring both arc flash and shock are identified and discussed. In fact, the electric shock hazard needs priority attention because electrical incident statistics advise us as a lagging indicator of a continued high frequency of fatal injury (e.g. electrocution).

Arc Flash & Shock PPE & Tools Innovations

In 2021 innovations were made in arc flash PPE and available hand tools to eliminate exposure. Oberon Company (www.oberon.com) developed an escape strap option for their arc flash suit jacket in 2020 and in 2021 added an “Escape Strap Vest” that can be worn over top of everyday/task-wear arc flash PPE. The escape strap can be used to release a worker that may be experiencing a shock or that has been exposed to an arc flash. It allows the first responder to stand back 10 feet or more and use the escape strap to pull the worker away from the electrical equipment to a safe area to



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Also in 2021, Amidyne Solutions (www.amidyne.ca) released their “Extend-a-Rack“ manual racking tool that uses a telescopic hot stick and coupling to engage with the power circuit breaker to rack it in or out. In most cases this will place the Qualified Person outside the Arc Flash Boundary distance, where full body arc flash PPE would not be required to be worn. This is a more affordable solution than a remote racking system and easy to transport and use.

Electrical Near Misses/Hits & Incidents

Unfortunately, in 2021 I was involved in providing support to several electrical incident investigations. This is a reminder that near misses/hits are occurring and in some improbable cases energized electrical equipment is failing without interaction. Following the PLAN-DO-CHECK-ACT philosophy audits and incident investigations need to be perceived as opportunities for improvement. Why was the policy, practice

or procedure not followed by the Qualified Person? What was the root cause of the abnormal arcing fault without interaction and how can we predict it or prevent it from happening again? Was human performance and human error the root cause? Was the appropriate arc flash & shock PPE worn and used?

Some of the reasons these incidents do occur relate to human performance and human error precursors:

1. Time pressure, rushing to complete the job and work task(s).
2. Simultaneous or multiple work tasks, complacency.
3. Lack of policies and practices.
4. Unfamiliar or first time performing a work task.
5. Lack of knowledge.
6. Lack of experience.
7. Illness or fatigue.
8. Stress.

What Is Happening In 2022?

In March I will be attending and presenting on electrical shock sequelae at the NETA PowerTest Conference in Denver, Colorado and then the following week attending and presenting at the IEEE Electrical Safety Workshop (ESW) in Jacksonville, Florida. John Knoll will be with me at the IEEE ESW to tell attendees about his experience with electric shock sequelae. I will also be attending the IEEE ESTMP Conference in Edmonton, Alberta and will be presenting on CSA Z462 and its relationship to IEEE 1584 as part of a panel session.

In May of 2022 we will be having our first formal and detailed CSA Z462 Technical Committee meetings to review submissions for change, improvements, and additions. Those changes will be reviewed and voted on and would be the basis for the 2024 Edition of CSA Z462. Yes we are still several years away, but the review meetings and review cycle take time.

The CSA Z463 Maintenance of electrical systems Standard Technical Committee will also be meeting to review the status of the 2018 Edition. CSA Z463 is not on the same cycle frequency as CSA Z462. I am not sure when we may publish an update. If you have ideas for changes, improvements or updates, please contact CSA or let me know and I will bring them forward to the CSA Project Manager.



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Terry Becker, PEng, CEM, 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.