
An Electrician's View on Workplace Electrical Safety

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INTRODUCTION

In recent years, the electrical and the occupational health and safety industries have been overwhelmed with the term “Arc Flash”. From [arc flash training](#), arc flash services, arc flash clothing, the list goes on. Those who have never witnessed such an incident, rarely understand what it is. Rather than gain a fulsome knowledge of the hazard, some will spend thousands of dollars on PPE and services without receiving the proper direction on how CSA Standard Z462 – Workplace Electrical Safety can be utilized as a toolbox of information that can assist the electrical worker in assessing a situation and making safe decisions.

Electrical workers must understand that there are two unique hazards with electricity. Shock and arc flash. As part of the decision-making process or risk assessment, based on the task, the worker must decide whether they are in harm's way of shock, arc flash, perhaps both, or maybe, none at all.

ASSESSING RISKS

There are factors that can help the worker in determining these risks. The following questions can be asked to gain insights into the risks of hazardous electrical energy:

- 1) *What is the voltage system?*** Most electrical workers perform tasks in the 30 - 600 Volts AC range. The CSA Standard Z462 starts at 30 Volts AC.
- 2) *Is it exposed?*** In other words, am I dealing with exposed energized conductors or circuit parts as opposed to touch-safe components?
- 3) *Are there any indicators of impending failure?*** Look, listen, and smell.
- 4) *How does the equipment present?*** Properly installed (meeting code requirements) and possessing maintenance records.
- 5) *Where is the equipment located?*** Environmental conditions such as weather, temperature, in a position where [working at heights training](#) is required, or is it within a [confined space](#)?

The above simple questions will help workers in making safe decisions as opposed to only donning PPE without knowing the implications.

CONTROL METHODS

Power Off

Of course, the safest decision is to work in an electrically safe working condition. “*Turn the power off*”. For circuits less than 1000 Volts, this involves the circuit parts have been disconnected from energized parts, [locked out and tagged](#) in accordance with established standards, and tested to verify the absence of voltage. Remember “*Test Before You Touch*”. Following lockout procedures must be paramount. As mentioned above, CSA Standard Z462 begins at 30 Volts AC. Typically, voltages less than 30 Volts AC are not considered hazardous. Energized electrical conductors and circuit parts that operate at less than or equal to 30 Volts AC or 60 Volts DC shall not be required to be de-energized when the capacity of the source and any overcurrent protection between the energy source and the worker are considered, and it is determined that there will be no increased exposure to electrical burns or to explosion due to electric arcs. (CSA Standard Z462-21)

Troubleshooting

In certain instances, it may not be feasible to perform work in an electrically safe work condition. Testing and troubleshooting is the most common example. This is considered energized (live) work. If this is the case, it would be suggested for the worker to ask the five simple questions stated above.

Warning Signs

Other things to consider would be if the area is isolated, like in an electrical room, or experiences high traffic from mobile equipment and other workers. Securing the work area with pylons or a tape line function as a warning and visible boundary for unauthorized persons to stay behind. This not only assists in protecting other workers, but also the electrical worker from an accidental push that could create unintentional contact. This is known as the “*Limited Approach Boundary*” in CSA Z462.

Protective Equipment

If the task may involve the risk of arc flash, such as troubleshooting on a 600 Volt system, a detailed warning label may be present at the equipment indicating the calculated incident energy measured in Calories/ cm². The worker would dress accordingly referencing CSA Z462 - Table 3. If the work requires close proximity to exposed energized electrical circuit parts or conductors, e.g. 1” from 600 Volts, then shock protection such as a rubber insulating blanket or rubber insulating gloves with leather protectors would be required.

CONSIDERATIONS

Physical Alterations

Energized work that involves making physical alteration of electrical equipment, conductors, or circuit parts, e.g., making or tightening connections or removing or replacing components, must not be performed unless it is impractical. An example of this situation would be repairs on an electrical system that is connect to life saving technology in a hospital. In fact, in both the Canadian Electrical Code and Ontario Electrical Safety Code it states, physical alteration of electrical equipment such as making or tightening connections, removing, or replacing components, etc. must not be conducted unless infeasible. Electrical workers must also be aware of their test instrument and its condition. “*Know Your Tester*” and the “*Live Dead Live*” test.

Working Alone

Other considerations include working alone, which may not necessarily be on the roof of a building. It could be in a remote internal location. Is a standby person (spotter) needed and an appropriate number of personnel trained in First Aid, CPR, and emergency contact release.

THE IMPORTANCE OF COMMUNICATION

For us tradespersons, policies, procedures, checklists, etc. must be brief and to the point. Complex detailed procedures with unnecessary clutter can prevent workers from taking the needed time to obtain key information that will support reducing their exposure to risk. Keep information in clear language. Finally, the most important thing we can do is ensure we are consistently communicating with supervisors and other workers in and around the work area. Pre-start meetings, tailgate talks, and planning sessions are critical to keep our team in the know.

CALL HOT ZONE WITH QUESTIONS

If you’re asking questions now, that’s great. Take the time to get those answers. And, if you need some direction on how to safely manage electrical hazards, give [Hot Zone](#) a call.