



Safety Measures ^{ELECTRICAL}

"All electrical incidents are preventable!
Keep employees safe with an up to date
Electrical Safety Program and appropriate training."

CSA Z462-2018: What Else Is Contained In The Standard That You Need To Know?

By Terry Becker, P.Eng.

Many of the articles I write focus on some of the key and very important information and mandatory requirements of the CSA Z462 Workplace electrical safety Standard required to effectively manage arc flash and shock hazard exposure to workers. We need to make sure that we read, understand and utilize the other information in CSA Z462 when we implement an Electrical Safety Program and provide arc flash & shock training to Qualified Electrical Workers and Non-Electrical Workers. As a complete Standard on workplace electrical safety CSA Z462 does include other specific information

that is used in the implementation of the Risk Assessment Procedure in Clause 4.1.6.8 and the application of the Hierarchy of Risk Control Methods to reduce risk to workers. Let's look at some of these policy or practice related content.

Electrical Safety Program

Clause 4.1.6 Electrical Safety Program does provide specific mandatory requirements that your company's Electrical Safety Program shall contain to be compliant and defensible. New to the 2018 edition was the inclusion that electrical

equipment shall be approved and inspected; this ensures that the basis of a ‘Normal Operating Condition’ is fulfilled before we would consider condition of maintenance. Clause 4.1.6.8 Risk Assessment Procedure now includes the mandatory requirements for human error to be considered and that all of the Hierarchy of Risk Control Methods be applied to reduce risk. The Hierarchy of Risk Control Methods are:

1. Elimination;
2. Substitution with other processes, systems or materials;
3. Engineering “Safety by Design;”
4. Warning signs and barricading;
5. Administrative training and procedures; and
6. Electrical Specific PPE, Tools & Equipment and proper care, use and maintenance.

In 2018, there are new requirements in Clause 4.1.6.9 for a documented and detailed Job Safety Plan. The documented Job Safety Plan shall:

1. Be completed by a Qualified Electrical Worker;
2. Be documented; and
3. Include the following information:
 - a. A description of the job and the individual energized electrical work task(s);
 - b. Identification of the electrical hazards associated with each energized electrical work task;
 - c. A Shock Risk Assessment for energized electrical work tasks involving a shock hazard;
 - d. An Arc Flash Risk Assessment for energized electrical work tasks involving an arc flash hazard; and
 - e. Work procedures involved, special precautions and energy source controls.

In Clause 4.1.8 Host and contract employer’s responsibilities are outlined. This involves a discussion of “Prime Contractor” OH&S responsibilities and liability.

Electrical Safety Training

Clause 4.1.7 Training outlines requirements for general electrical safety training for arc flash & shock for Qualified Electrical Workers and Unqualified Persons. Specific electrical safety training requirements are outlined in Clause

4.1.7.1. They shall include: arc flash & shock training with safety-related work practices, lockout procedure training and emergency procedure training with specific instruction on contact release.

Non-Electrical Worker

I find that this worker role (e.g. operator, custodians, carpenter, mechanic, welder, etc.) is often not addressed in a company’s Electrical Safety Program. Clause 4.1.10 Portable cord-and-plug connected electric equipment and Clause 4.1.11 Ground-fault circuit interrupter (GFCI) protection provide guidance and requirements related to this worker role. This is where the shock risk to the Non-Electrical Worker (Unqualified Person) exists. Risk reduction is achieved by awareness training and instruction of proper care, use, testing and maintenance. A GFCI shall be tested before use!

Lock Out

Moving forward in CSA Z462 to Clause 4.2 Establishing an electrically safe work condition, there is amazing content related to control of hazardous energy, lockout and other methods that are applied specifically to electrical equipment. This Clause identifies requirements for a lockout program, lockout principles, lockout equipment, lockout procedures (e.g. individual, group and complex). One item to point out is the specific “process for establishing and verifying an electrically safe work condition.” This process was updated in 2018 to include two additional requirements related to release of stored electrical energy and release or blocking of stored mechanical energy. Ensure your company follows this eight (8) step process specific to electrical equipment isolation, and **TEST-BEFORE-TOUCH – every conductor, every circuit part, every time!**

Policies & Practices

Clause 4.3.6 Other precautions for personal activities in CSA Z462 provides several requirements that have a direct impact on Likelihood of Occurrence (e.g. probability or arcing fault occurring or exposure to the shock hazard) related to the risk assessment applied to energized electrical work tasks.

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- Lookalike Equipment

Specific policies and practices shall be documented in your company's Electrical Safety Program to ensure that these requirements can be enforced.

Special Equipment

For some industries or institutions that use specialized electrical equipment that may have specific requirements, you can find information on electrolytic cell lines, batteries, lasers, power electronic equipment and work requirement for research and development laboratories in CSA Z462 Clause 6 Safety requirements for special equipment.

Annexes

The annexes in CSA Z462 contain a wealth of information that is provided in reference to clause content. Specific information is included on how to apply CSA Z462 in a safety management system, such as: limits of approach; an example

of an Energized Electrical Work Permit (EEWP); a detailed Lockout Program; more explanatory information on what the electrical hazards are; examples of compliant arc flash & shock Equipment Labels; high voltage substations and related practices; and detailed information on human performance.

It is really important that you look at all of the content in CSA Z462 to ensure your policies, practices and procedures used to reduce risk take advantage of and document the information that is being applied. Your company's Electrical Safety Program should include relevant content in the appropriate table of content section that addresses the requirements listed in this article.

Please submit any questions or comments you may have to Kevin Buhr and myself at kevinb@electricalline.com and tbecker@danatec.com.

Terry Becker, P.Eng., CESC, IEEE Senior Member is the first past Vice-Chair of the CSA Z462 Workplace electrical safety Standard and currently a Voting Member and Working Group 8 Leader; Annexes. Terry is also a Voting Member on the IEEE 1584 Technical Committee and an Associate Member of the CSA Z463 Guideline on maintenance of electrical systems. Terry is a Professional Engineer in the Provinces of BC, AB, SK and ON. Terry is Senior Vice President, Electrical Safety, Danatec Educational Services Ltd., providing electrical safety consulting, licensed products and training solutions. www.danatec.com.

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