

Z463 Maintenance of Electrical Systems



If your business must perform some form of electrical maintenance in order to maximize safety and to minimize downtime, **why not do it in the most effective, safe and efficient way possible?**

Virtually all business types use electricity and power for their operation yet surprisingly, Canada currently does not have a national standard or guideline for electrical equipment maintenance. Implementing a safe, efficient, effective electrical maintenance program can save time and money and, more importantly, can help reduce serious injuries or fatalities.

A gap currently exists between safe equipment design and installation as addressed by the **Canadian Electrical Code, Part I**, and safe workplace electrical practices as addressed by **CSA Z462 – Workplace Electrical Safety**. **CSA Z463 – Maintenance of Electrical Systems** – is a guideline that will help close this gap. It will provide a concise set of advisory documents that will help electrical system managers and consultants protect workers and property, as well as extend the life of electrical equipment.

Why is Safe and Efficient Electrical Maintenance a Common Need Across Sectors?

Electrical hazards exist in many different industries across the country, including manufacturing, oil & gas, health care, education, property management and transportation. These facilities require regular electrical maintenance to help ensure efficient and safe operations, and employees working in these facilities can be exposed to a range of hazards.

To assist workers and employers in risk assessment and development of safer work practices, CSA Group developed **Z460, Control of Hazardous Energy: Lockout and Other Methods**, and the first edition of **Z462**. Most facilities need to perform regular maintenance on their electrical equipment, yet there is no Canadian—federal or provincial— guideline, standard or act to help employers and employees more effectively develop and implement an electrical equipment maintenance program. Health care facilities, schools, manufacturing plants, office buildings, condominium buildings, and airports are just some examples where electrical maintenance is critical to efficient and safe operations.



According to the Canadian Centre for Occupational Health and Safety, the electrical current required to power a typical home or business is sufficient to electrocute someone. In Ontario, between 2007 and 2011, over 40% of these types of incidents occurred during repair and maintenance activities.¹ If your business must perform some form of electrical maintenance in order to maximize safety and to minimize downtime, why not do it in the most effective, safe and efficient way possible?

What is CSA Z463?

Z463 will initially be recognized as a voluntary best practices guideline. In the future, federal and provincial governments may choose to reference it in regulations. Based on already well established standards including **Z460** and **Z462**, as well as **Z1000 – Occupational Health and Safety Management**, **Z463** will provide information to help employers develop an electrical maintenance program or to improve their existing programs. It is also based on Canadian Electrical Code standards and other industry maintenance standards (e.g., NEMA, NFPA, NETA, and IEEE).

This new CSA Guideline will focus on principles of predictability, expected failure modes, and pre-emptive scheduled maintenance to avoid extensive downtime and maintain a state of readiness for critical equipment. Applicable to most types of electrical systems, **Z463** is a general guideline commonly used in industrial and commercial operations, but it also contains a section on maintenance of special equipment and life-critical systems.

While **Z463** is useful for large companies who often use contractors for their electrical maintenance needs, it is at its core an instruction set that can provide small to medium sized enterprises with direction for developing and administering an electrical maintenance plan. Essentially, anyone starting or upgrading an electrical maintenance program and concerned with the proper care and use of electrical equipment can benefit from using **Z463**.

What Z463 is NOT

As of now, **Z463** is not mandatory. It is a voluntary guideline.

The Guideline is also not intended for application to household electrical systems and does not address residential and personal use of equipment; it is designed for commercial and industrial buildings. However, it is important to note that it can be applied to large residential buildings, such as a condo complex or a long-term care home that may have more complex electrical systems.

While large companies or utilities can use **Z463** to assess the quality of their maintenance programs, its greatest value can be realized when used by small-to-medium size businesses and facilities that are challenged by limited resources.

Finally, **Z463** is not a replacement for any existing standards and resource materials, but rather it will reference them and advise utilization where appropriate.

How was Z463 Developed?

Z463 was developed by a voluntary Technical Committee that was selected using CSA Group's recognized matrix process to ensure industry, labour and government stakeholders from all provinces in Canada were represented. The committee was comprised of 45 members from related groups and fields of expertise, including representatives of NFPA, IEEE, NETA and the CSA Electrical Code Committee. Key stakeholder groups from across Canada including senior management, electricians, engineers and supervisors as well as those who supply and maintain electrical equipment and services to Canadian industrial and commercial work places.

Each of the nine sections of the guideline has a working group leader and then volunteers from the committee joined each group to support the leadership. In some cases, members made a significant commitment by participating in more than one group.

¹Electrical Safety Authority 2012 Ontario Electrical Safety Report



Advancing Today
Anticipating Tomorrow

What You Can Expect to Find in Z463

A significant amount of information was reviewed and discussed at the committee level during the development of **Z463**, and the end result was a 150 page document consisting of nine sections. The first three sections explain the scope and application as well as important references and key definitions. The main body covers how to effectively and correctly establish an electrical maintenance program as well as safety as it pertains to maintenance. The final sections of **Z463** address specialized equipment as well as equipment-specific maintenance procedures. The nine sections are: Scope, Reference Publications, Definitions/Abbreviations, Electrical Maintenance as Part of a Quality Management System, Maintenance Practices, Electrical Maintenance as Part of Workplace Safety, General Maintenance Practice, Equipment Specific Maintenance Practices, and Specialized Equipment Maintenance. In addition, the document includes an informative Annex containing valuable technical information, tables, and reference information from other documents.

Z463 - A 'Made in Canada' Solution

CSA Group has developed a reputation for developing important, relevant electrical standards for more than 80 years. Building on this legacy and supported by a committee of volunteer industry experts, **Z463** will help to ensure continued optimal safety and reliability of Canada's electrical system.

Based on well recognized management system standards, such as **ISO 9000** and **Z1000**, **Z463** is designed to complement the CE Code as well as CSA Group electrical standards. In addition, it is derived from tried-and-true best practices from top-performing organizations and fits well with practices endorsed by IEEE, NFPA, INSURANCE UNDERWRITERS, NETA, PEARL, and others.

Breadth of applicability is also an advantage of using **Z463**. The comprehensive guideline covers a wide variety of work environments, electrical equipment and systems, provides many examples, and references resource materials available on-line and through other sources. Along with **Z460** and **Z462** it forms a reference trio relating to the safe and effective management and operation of electrical power systems.

Helping to protect assets and the overall business model by reducing the likelihood of critical breakdowns **Z463** also helps to ensure due diligence for personnel safety and corporate liability. Anyone responsible for the operation, performance and reliability of even the smallest commercial electrical system will quickly derive value from owning a copy and implementing the guidelines within.

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John Hodson is a journeyman electrician, electronics engineering technician, and electrical engineering technologist, and is a founding member of the Z463 Technical Committee. **Dave Shanahan** is a CSA Group Project Manager in the Occupational Health & Safety program, and worked with the Technical Committees for both Z463 and Z462 standards. The **Z463 Guideline** is expected to be published in September 2013. A planned **1-day training course** will assist understanding on how to incorporate electrical maintenance into overall quality management systems. For more information on Z463 and related products and training, visit shop.csa.ca.

About CSA Group

CSA Group is an independent, not-for-profit membership association dedicated to safety, social good and sustainability. Our knowledge and expertise encompasses standards development, training solutions, consumer product evaluation services, and global testing & certification. Our key areas of focus include: hazardous location & industrial, plumbing & construction, medical & healthcare, appliances & gas, alternative energy, lighting and sustainability. The CSA certification mark appears on billions of products worldwide. For more information about CSA Group visit www.csagroup.org