Best Practices for Electrical Safety Training

Working on or near energized electrical equipment, troubleshooting, and other electrical operations are extremely dangerous. That's why it's essential to implement an electrical safety program that includes the training for exposed workers required by OHS laws and nongovernmental standards like CSA Z462 and NFPA 70E. Here are 9 Best Practices for delivering effective electrical safety training.

1. **Determine Who Needs Electrical Safety Training**

Employers must provide electrical safety training to:

- **Qualified workers** with the skills, knowledge and training to perform electrical tasks.
- **Unqualified workers** who work with or near electrical equipment but aren't qualified to perform electrical tasks.
- **Supervisors** who oversee and monitor the work of qualified and unqualified personnel involving electrical hazards.

2. **Ensure Electrical Safety Training Content Covers the Right Bases**

While it can't be one-size-fits-all, electrical safety training should incorporate 6 basic elements:

1. i. Fundamentals of Electrical Safety

Workers exposed to electrical hazards must have a basic understanding of what electricity is and how it can be dangerous. Accordingly electrical safety training should cover:

- Basic concepts of electricity, including current, voltage, resistance, etc.
- How electrical shock occurs and the techniques for preventing it.
- How arc flash occurs and the techniques for preventing it.
- The importance of grounding and ground fault circuit interrupters (GFCIs).

1. ii. Hazard Identification & Risk Assessment

Electrical safety training must show workers how to assess the hazards they face before starting work, including how to:

- Recognize and distinguish common electrical hazards like arc flash, shock, and electrocution.
- Distinguish between energized and non-energized parts and equipment.
- Implement strategies to ensure the right person is doing the right electrical job.

iii. Safe Work Practices

Training should educate workers about the company's electrical safety policies, procedures, and protocols and how to carry them out, including:

- Lockout/tagout (LOTO) procedures for controlling hazardous energy during servicing and maintenance of machinery and equipment.
- Establishing an electrically safe work condition.
- Proper use, inspection, maintenance, and care of power tools and equipment, including proper grounding, disconnecting power before adjustments, and avoiding

unsafe practices like bypassing on/off switches or using tools in wet conditions without proper protection.
- Maintaining safe approach distances for different voltage levels.
- Proper use and maintenance of plugs, cords, and GFCIs.
- Working safely around power lines.

1. iv. PPE & Protective Clothing

Ensure electrical safety training covers the proper use, inspection, maintenance, care and limitations of the PPE and protective clothing required for electrical work, which may include:

- Insulated gloves protecting against electrical shocks and burns that are rated for the voltage levels the worker encounters;
- Safety glasses, goggles or other eye and face protection guarding against flying debris, sparks or flashes;
- Face shields providing a barrier against arc flash, hot sparks and other debris
- Insulating boots or shoes providing a barrier against electrical shock from the ground;
- Hard hats which may include insulation to protect against accidental contact with live electrical conductors; and
- Arc rated, flame-resistant and other protective clothing.

1. v. Emergency Response Procedures

Train workers what to do if electrical incidents and emergencies occur, including:

- First aid treatment of shock, burns, cardiac arrest, and other electrical injuries.
- How to respond to shock, electrical fires, gas leaks, and other electrical incidents and emergencies.
- Emergency shutdown procedures.

1. vi. Applicable Laws & Standards

Electrical safety training must address the regulatory and other safety requirements that apply to the work, including:

- Provincial/Territorial/Federal OHS electrical safety regulations and electrical codes.
- Local electrical codes and regulations.
- CSA Z462, NFPA 70E, the *Canadian Electrical Code* and other nongovernment standards.
- Industry standards.

3. **Tailor Electrical Safety Training to Job Responsibilities**

Customize electrical safety training to the worker's particular job roles and responsibilities:

- **Maintenance Staff:** Focus on LOTO procedures, safe equipment handling and de-energization techniques.
- **Office Workers:** Highlight risks like overloaded outlets and damaged cords.
- **Supervisors:** Explain how to monitor compliance with enforce your company's electrical safety policies, procedures, and protocols.

4. **Make Electrical Safety Training Interactive & Engaging**

The more you can get workers to engage, the more likely they are to understand and retain their electrical safety training. Techniques to consider:

- Simulated hazard exercises requiring workers to identify and manage particular electrical risks.
- Physical demonstrations of the proper use of electrical PPE, GCFIs, grounding, and other safety equipment or measures.
- Encouraging workers to ask questions and share their experiences.
- Emergency drills that require workers to respond to

simulated electrical incidents.

5. **Verify that Workers Understand their Electrical Safety Training**

Simply delivering electrical safety training isn't enough. Some workers may simply go through the motions just to get their training over with; others may struggle with the material but pretend they understand it because they're too embarrassed or afraid to ask questions. That's why it's essential to verify that trainees understand and are capable of applying their training. Having workers sign a written acknowledgement of having received and understood their training won't do, lawyers caution. Verification must be meaningful. Techniques for verifying training include:

- Post-training quizzes or exams that workers must pass to avoid retaking the lesson, preferably made up of questions that require workers to apply the material to real-life situations rather than simply regurgitate it.
- Post-training demonstrations proving that workers comprehend and are competent to apply what they learned.
- Observing what trainees do (and don't do) when they get back to work.

6. **Keep Records of the Electrical Safety Training You Provide**

Keep written records of the electric safety training you provide that list:

- The trainer and trainee's name.
- The time and dates training was provided.
- The information the training covered.

Document test scores and the actions you took to verify trainees' comprehension and competency to apply their training. These documents demonstrate your commitment to

safety and your good-faith effort to comply with laws and standards. They're also one of the first things OHS inspectors will look for when investigating an electrical incident or complaint.

7. **Provide Refresher & Retraining**

Qualified and non-qualified workers exposed to electrical hazards should receive regular electrical safety training at least once a year to remain up to date with the latest regulatory requirements, safety standards, and practices. You should also provide training as necessary in response to the introduction of new equipment, changes to safety procedures, electrical incidents or complaints, and other indications that current training isn't adequate and needs to be revised or repeated. Workers should also receive training before being assigned to new roles involving exposure to electrical hazards that their previous training didn't cover.

8. **Audit Electrical Safety Training Program Effectiveness**

Treat your electrical safety training program as a work in progress subject to continuous monitoring and improvement. One common approach is to perform regular program audits at least once a year that includes review of:

- Records of recent electrical incidents (including near-misses) and injuries and how they compare to records from previous years.
- Training and retraining attendance records and quiz scores.
- Changes to regulatory rules and standards and company electrical safety policies and procedures.
- Current training materials to ensure they incorporate such changes.
- Workers' feedback, including recommendations from your workplace joint health and safety committee or health and safety representative.

9. **Continually Revise & Improve Your Electrical Safety Training Program**

Use the results of your audit to make appropriate changes and improvements to your electrical safety training, for example, by adding a new section to your e learning courses covering recent revisions to permitting requirements and PPE selection contained in CSA Z462-2024.