



Dangers of Working with High Voltage

eSource Newsletter

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The job of a power lineman is fraught with danger. Anyone willing to deal with hundreds and thousands of volts of electricity while being suspended in the air deserves respect. As you might expect, when an accident occurs on one of these job sites, it can be catastrophic. This only heightens the need for as many safety standards and precautions as possible. If you're looking to get into one of this country's most dangerous professions, this would be a strong contender. The Bureau of Labor Statistics reports that the job of electrical line worker ranks among the top ten most dangerous according to its latest figures. Per 100,000 workers, this position has a fatality rate of 18.7, making it the tenth deadliest on the list.

Power Lineman – A Hazardous Occupation

According to the BLS, line installers and repairers are classified as occupations with "serious hazards." There are approximately 242,000 such positions in the United States, and the job growth rate for this industry is roughly 4%.

Line installers and repairers install or repair electrical power systems as well as telecommunication systems, including fiber optics. They often work at heights and can be exposed to high-voltage electricity. The hours of the work can vary, with some jobs done during inclement weather, and the work can be physically demanding. Some of the most common hazards and risks that these workers face daily include electrocution, falling from heights, confined space injuries, environmental stress, and repetitive motion injuries.

The Dangers of Working with High Voltage

While the number of electrical fatalities has continued to decline over recent years, the risk of working near high voltage power is significant. The most common electrical fatalities occur due to contact with overhead lines and with transformers.

There are four primary types of injuries that can happen due to contact with a strong electrical current:

- **Electrocution** – This occurs when an electrical current passes through the body, which can be fatal.
- **Electric shock** – An individual that comes into contact with a current, either directly or indirectly, could suffer severe burns and other long-term consequences.
- **Burns** – Severe burns can take place from an electrical current as well as from electrical fires and explosions.
- **Falls** – A worker's contact with a high voltage current can cause loss of muscle control or unconsciousness, leading to a catastrophic fall.

Power Lineman Safety – Preventing Dangerous Workplace Accidents

We've established that working with electricity and cable systems is an inherently dangerous business. So, how can employers keep their workers safe? Unfortunately, not all companies and jobs have a culture that is dedicated to safety. Some new lineman might hear, "that might be what you learned in training, but this is how we do it in the field..."

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Safety standards and training are meant to keep power linemen safe, but shortcuts aren't helping matters. Most contractors are highly committed to safety because it's clear that an injury or something worse would spell financial disaster for their business.

The current best safety practices for power linemen include:

•**Administrative controls** – This refers to identifying potential hazards prior to work through a preliminary job site analysis. The contractor should request information in advance when possible.

•**Pre-use inspection of rubber protective equipment** – Rubber protective equipment keeps power linemen safe from electrical hazards on the job. This equipment should be inspected prior to each use for wear, damage, or contamination.

•**Job briefings** – **Job briefings should be held at the start of a work shift and any time that work significantly changes.** They should review critical and routine tasks, identify hazards as well as roles and responsibilities, determine risk, and designated PE to be used.

•**Qualified observer** – A qualified observer must be identified and used for certain critical tasks. They will ensure that PPE and the right cover-up is installed and effective clearances are used.

•**Cradle-to-cradle use of sleeves and insulating rubber gloves** – Protocols must be followed relative to the use of rubber protective equipment when working with energized equipment.

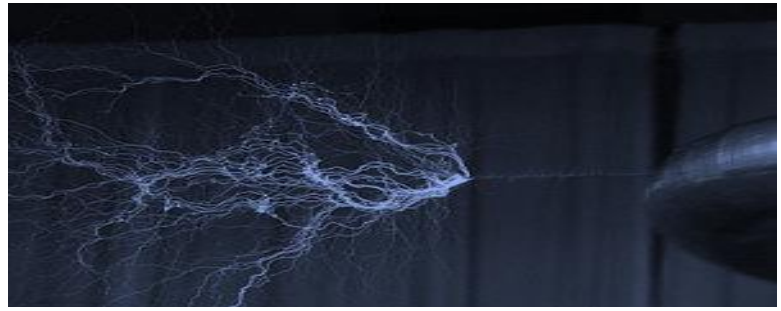
•**Fall protection when working on lattice structures** – When a power lineman worker is performing certain aerial work, they must use fall protection equipment (FPE) when working, ascending or descending, or changing positions while on a lattice structure.

•**FPE while working on wood poles** – FPE is required when performing aerial work on wood poles as well as when ascending, descending, or changing position.

•**Insulate and isolate safety performance check** – A periodic review of safety procedures should be done to confirm that the company is in compliance with insulate and isolate procedures.

•**Information transfer** – Ensure that information related to the conditions of the electrical equipment related to safety issues are communicated to the employer or contractor. The contractor must also communicate any known hazards to the electrical workers.

When these standards aren't followed, or only followed haphazardly, the risk of a serious accident goes up significantly.



Know When to Work / When Not to Work

There are some key things to remember when experimenting with high voltage systems. Here is a list of good practices based on the information presented here.

- Always work on a circuit that is de-energized if at all possible. De-energized includes discharging any potential stored energy. Check multiple times that the circuit is de-energized and ensure that no one can apply power to the circuit without you knowing it. This can be achieved with Lock-out Tag-out procedures.

- Always work with at least one other person who is familiar with the equipment, its hazards, and emergency procedures. Make sure everyone knows how to call 911.

- Use test instruments and components only at their rated conditions.

- Wear proper laboratory attire near the circuit. This means rubber soled, closed toe shoes and long pants. Jewelry, especially metal jewelry that can accidentally contact a circuit should be removed.

- Always discharge capacitors with a grounding stick before working on a circuit. Insure the capacitors remain discharged by shorting them and tying them directly to ground.

- Don't perform work if you are mentally compromised. If you are tired, upset, or otherwise cannot concentrate fully, do not work with high voltage. Your intelligence is your primary safety tool, and if it cannot be employed fully, you should not work until you are mentally prepared to do so.

- Keep stored energies, currents and voltage as low as possible at the design stage.

- Never assume a circuit is safe just because it is powered off. Energy can be stored in capacitors and long cable runs. There can be interior short and open circuit faults. Check, check, and check again that a safe, de-energized state has been achieved.

EVENT CALENDAR

July 8, 2021

IMEA Brown Bag Virtual Series

Introduction to Distribution Automation / G&W Electric

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July 13, 2021

IMEA Brown Bag Virtual Series

End to End Lateral Protection / Jeremi Jermakowicz / S & C Electric

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August 24-25, 2021

**IMEA Transformer Theory and Connections Workshop
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August 30 – September 3, 2021

**IMEA 613 Advanced Construction and Maintenance
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Class # 100118

Mid-America Science Park (Scottsburg, IN.)

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September 20 - 24, 2021

**IMEA 612 Intermediate Construction and Maintenance
Workshop**

Class # 093019

Mid-America Science Park (Scottsburg, IN.)

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September 27 – October 8, 2021

IMEA 610 Wood Pole Climbing Workshop

Class # 092721 (Lebanon Utilities)

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October 12 – 15, 2021

**IMEA Annual Business Meeting & Vendor Expo
Embassy Suites Hotel & Conference Center
Noblesville, IN.**

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October 26 – 27, 2021

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IOSHA**

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