ELECTRICAL SAFETY: Take 4 Steps to Protect Workers Around Overhead Power Lines

Overhead power lines pose serious safety hazards, most notably the risk of electrocution. But workers, such as roofers, construction workers and others often forget about this hazard because, well, it's literally over their heads. And electrocution isn't the only danger. For example, workers in BC were installing a 56′ long section of metal gutter on a building when the end of the gutter touched an overhead power line. The resulting electric shock knocked one worker off a ladder and onto a concrete patio 22′ below. He died from the injuries he suffered in the fall'not from the shock. So here's a look at the steps you should take to protect your workers when they work around or near overhead power lines and comply with the power line requirements in the OHS laws.

Defining Our Terms

This article covers the general requirements for work *around* overhead utility lines and doesn't address the requirements for work *on* such lines, which typically must be done by specially trained and qualified workers. It also doesn't cover the requirements that specifically apply to tree trimming or pruning work around overhead utility lines.

REGULATION OF WORK NEAR POWER LINES

The OHS laws take two basic approaches to regulating work around or near overhead power lines (See the bottom of post for the general requirements for such work in each jurisdiction.):

Specific overhead power line requirements. Most jurisdictions have specific requirements for work around overhead power lines. The requirements in some jurisdictions, such as AB, MB, ON and QC, are very detailed, while the others have very general or narrow requirements.

General requirements for work around high voltage equipment. A handful of jurisdictions'Fed, BC and YK'don't have requirements specifically for work around overhead power lines. Instead, they address such work in their requirements for all work around high voltage equipment, which includes overhead power lines. (Note that the jurisdictions with specific overhead power line requirements also have general requirements for work around other kinds of high voltage equipment.)

***Insider* Says:** The OHS regulations in NT and NU simply require all work near overhead electrical conductors to be carried out in compliance with the *Electrical Protection Act* and related regulations.

TAKE 4 STEPS TO PROTECT WORKERS

Naturally, you must comply with the specific requirements for work around overhead power lines in your jurisdiction's OHS law. However, there are certain basic steps that all employers should generally take to protect workers working around overhead power lines:

Step #1: Contact Power Line Operator

When there's any chance that workers, equipment or materials could contact an overhead power line, you should get in touch with the line's operator for a few reasons. First, the particular safety measures you'll need to take depend largely on the voltage of the overhead power line. So you'll need to contact the operator for that information. Second, in some jurisdictions, you're required to notify the operator of any

planned work that'll take place within designated distances (typically 3 to 7 metres) of overhead power lines.

Lastly, you may need the power line operator's assistance in protecting workers. For example, if workers must conduct work closer to overhead power lines than the designated safe distance (more on this below), than you may need to get assurances from the operator that the line is either de-energized while that work is done or is adequately insulated or guarded. In some cases, the operator may need to relocate or reroute the line for the work to proceed.

Step #2: Determine Minimum Safe Distance

Once you know the voltage of the overhead power line at issue, you must determine how close workers can get to the line and still safely work. The so-called safe limit of approach or minimum safe distance varies by voltage and jurisdiction. Most OHS laws include a chart that spells out the minimum safe distance for lines of varying voltages. For example, in Ontario, equipment must be kept at least the following distances from live power lines:

Voltage of Live Overhead Power Line	Minimum Safe Distance
750 to 150,000 volts	3 metres
150,001 to 250,000 volts	4.5 metres
250,001 volts and over	6 metres

So check your OHS law to determine the minimum safe distance for the voltage of the overhead power line impacting your work.

Step #3: Implement Appropriate Safety Measures

Now that you know the minimum safe distance, you can implement appropriate safety measures. Which measures to use largely

depends on whether workers will be able to maintain that safe work distance, which isn't always possible:

Work outside of minimum safe distance. Even if workers will be able to do their job without coming any closer to the overhead power line than the designated minimum safe distance, you still need to implement safety measures to protect them. As always, the specific requirements vary by jurisdiction. But one of the most common requirements is the use of a signaller to ensure that workers comply with the minimum safe distance, especially when operating machinery such as cranes, lifts or dump trucks.

The signaller or signal person should be a 'competent' person trained to work as a signaller. (For more information on who qualifies as a 'competent person,' see '[Compliance 101: What Makes a Worker a 'Competent Person' under OHS Laws']' Sept. 2008, p. 11.) The signaller's job is to alert equipment operators when they're coming too close to the power line. Ideally, the signaller and the worker operating the equipment should have unobstructed views of each other. If that's not possible, they should have an appropriate means of communication, such as a radio, or use a third person who can see both of them and relay signals between the signaller and the equipment operator. The signaller should also try to keep other workers and people out of the area if they don't need to be there.

Other safety measures to consider include posting signs warning workers and others of the possible electrical hazard, barring the piling or storage of materials under or near power lines and barring the use of metal or wire-reinforced ladders in the area. Using a metal ladder near a live power line can have tragic consequences.

Example: A 22-year-old roofer in New Brunswick and a co-worker had just finished installing shingles on the roof of a building and were taking down an aluminum ladder. While his

co-worker was holding the base down with his feet, the roofer stood under the ladder and pushed the top out so it was standing in a vertical position. He then turned the ladder 90 degrees and began walking backwards to lower it to the ground. That's when he contacted a 7,200-volt overhead electrical line. He was electrocuted and died immediately. The WorkSafeNB investigating officer determined that, when vertical, the ladder was within 30 to 40 cm of the electrical line; turning it 90 degrees brought it within 10 to 15 cm; and the sideways movement of walking it down to the ground caused the fatal contact.

See the box to the upper right of this post for some additional general safe work practices for work around overhead power lines.

Work within minimum safe distance. Due to the nature of the work to be done, workers may not always be able to stay beyond the minimum safe distance. Because work within that designated distance is, by definition, unsafe, special measures must be taken to protect workers. In such circumstances, you should notify the operator of the power line that work has to be done within the minimum safe distance and get its assistance. In general, workers shouldn't work within the minimum safe distance unless:

- The power line is de-energized;
- The operator provides assurances that the line is adequately insulated or guarded; or
- There's an alternative method of protecting workers, such as relocating or rerouting the line.

In addition to these special measures to protect workers, you should also implement the safety measures discussed above for work outside of the minimum safe work distance. For example, even if the power line is turned off, you still don't want equipment to contact or get entangled in it. So using a signaller is good practice.

Step #4: Train & Supervise Workers

Any workers who may have to work around overhead power lines should be trained on the safety procedures for such work, the minimum safe distances and what to do in the event that materials or equipment contact a power line (see the box on the upper right). And because work around power lines is so dangerous, it’s especially important that it be properly supervised.

BOTTOM LINE

Injuries and deaths from contacting overhead power lines are more common than they should be. For example, according to a 2009 Ontario Electrical Safety Authority report, power line contacts account for 49% of all electrocutions over the last ten years. So it’s critical that you implement proper safety measures when your workers have to work around or near overhead power lines.