Electrical Safety – Compliance Game Plan

The 6 things to do to prevent electrocution deaths and OHS violations.

Working in the vicinity of live power lines and other unguarded and uninsulated high-voltage electrical sources (which, for simplicity's sake, we'll refer to collectively as 'power lines'). The primary hazard is electrocution, which can occur when workers or their equipment contact power lines. Such incidents are responsible for the deaths of 24 workers in Ontario in the last 10 years. **Example:** A 22-year-old roofer in New Brunswick lost his life when the aluminum ladder he was lowering to the ground contacted a 7,200-volt overhead power line.

Workers and equipment don't have to actually touch a power line to lose their lives. Simply coming too close may be enough to cause arc flash resulting in explosions and fatal burn injuries. While construction workers are at the greatest risk, any worker who works in the vicinity of a power line is at risk. Here's a 6-step game plan for protecting your workers and ensuring compliance with OHS requirements for work near power lines.

> ***Defining Our Terms***
> *This Game Plan covers work near power lines rather than work on such lines, which may only be done by specially trained and qualified electrical workers. It also doesn't cover*

utility work or tree pruning operations near power lines, which are subject to separate requirements.

Step 1. Contact Power Line Operator Before Work Starts

Before carrying out the work, you must determine whether there are any live power lines in the areas where workers will be working and equipment and vehicles will be operating. If so, and if there's a danger of personnel or equipment coming too close or into contact with those lines, you must contact the utility company that owns and operates the line to find out what the voltage is. In addition, many jurisdictions require employers to notify the utility operator before beginning any work within a designated distance (typically 3 to 7 metres) of an overhead power line.

Step 2. Determine Safe Limits of Approach Distance

There are limits to how close workers and equipment can come to an energized power line depending on the phase to phase and, in some jurisdictions, line to ground voltage. These limits vary by jurisdiction. For example, in Ontario, the limits are:

Voltage of Live Power Line	**Minimum Distance**
750 to 15o ooo volts	3 metres
150 001 to 25o ooo volts	4.5 metres
Over 250 000 volts	6 metres

Step 3. Maintain Safe Limits of Approach Distance

Once you determine the limits of approach, you must take steps to ensure that workers and equipment don't get any closer than allowed. The first thing to do is to clearly mark approaches and post warning signs barring unauthorized personnel from approaching, piling or storing materials or using equipment in the danger area. Many jurisdictions also require you to designate a 'competent' and appropriately trained person to act as a signaler to ensure that workers comply with the minimum safe distance, especially when operating machinery such as cranes, lifts or dump trucks. The signaler and worker operating the equipment should have unobstructed views of each other. But if that's not possible, they should have a radio, flagging system or other appropriate means of communication.

Step 4. Get Power Company's Assurance If Minimum Safe Distances Can't Be Maintained

Sometimes, it's just not possible to maintain minimum safe limits due to the circumstances of the work or the risk of inadvertent movement of workers or equipment. In such situations, work may not begin unless and until the employer receives a written and signed assurance from the operator of the power line either verifying that contact wouldn't be dangerous or, if contact would pose a danger, setting out the measures to be taken to ensure the work can be carried out without exposing workers to such danger. The assurance should provide for:

- **First Choice:** If practicable, rerouting or shutting off power to the line while the work is performed;
- **Second Choice:** Isolating and grounding the power line

during the work, If rerouting or displacement isn’t practicable;

- **Third Choice:** Visually and identifying and guarding the power line during the work, if isolation and grounding isn’t practicable’where guarding is used, unqualified workers or equipment must not be allowed to touch the guarding, and either a safety watcher must be designated or approved range-limiting or field detection device must be used to ensure no person or thing gets by the guarding;
- **Fourth Choice:** If none of the above measures are practicable: i. the area must be barricaded with restriction limited only to workers necessary to carry out the work; and ii. there must be a safety watcher who’s provided a positive and exclusive means to give workers in the area a clear, understandable stop signal.

The safeguards outlined in the written assurance must be in place before the work begins and be kept in place for as long as the work continues. The employer must keep the written assurance at the workplace in a location available for inspection and that’s as close as possible to the area where the affected work is carried out.

Step 5. Implement Safe Work Procedures

Develop, implement and ensure workers are adequately trained how to carry out safe work procedures when working in areas where there are live power lines, which should include:

- Being constantly aware of and maintaining safe clearance from power lines;
- Not using metal or wire-mesh ladders or other tools made of conducting materials near power lines;
- The importance of keeping clothes dry; and
- What to do if contact or arc flash occurs.

Step 6. Ensure Workers Use Proper PPE

PPE for work near power lines may include:

- Electrically tested insulating gloves;
- Rubber soled boots;
- Safety headwear designed to protect against electrical shock;
- Rubber insulating mats.