

# Shock treatment



By Carey Tarr



Any tradesperson who fails to maintain a safe distance from overhead power lines is making a deadly error in judgment.

Look up. Across the industrial sector, people are working in close proximity to overhead electrical wires. Qualified electrical workers are familiar with the hazards of overhead lines. But a vast range of other trades workers – from framing crews to window washers – could be one momentary lapse in judgment away from the shock of a lifetime. Literally. “It doesn’t matter what the wire looks like; they all bite,” says WorkSafeBC engineer Seth Nair.

Between 2004 and 2008, workers submitted 18 claims related to contact with overhead power lines, including short-term, long-term, and fatality claims. As worker education improves, those numbers are decreasing, with seven claims reported in 2004, six in 2005, two in 2006, one in 2007, and two in 2008.

But given the severity of electrical contact incidents, every claim is one too many.

“Most of the contacts we see involve 25,000 volts,” Nair says. “But even a 120-volt shock can kill you.”

As recently as this spring, WorkSafeBC occupational safety officer Stephen McCollum was called to look into a near-miss incident involving power lines in downtown Vancouver. A construction crew had been applying sheets of shrink-wrap to scaffolding, with workers clutching either end of the 12.2-m (40-ft.) sheet. Suddenly, a gust of wind tore the shrink-wrap from one of the worker’s hands, blowing it tightly around two energized conductors. One of the conductors burned through the wrap and fell to the ground – energizing a chain link fence and narrowly missing nearby workers.

Carpenter/foreman Jose Landaverde (sr.) and carpenter Jose Landaverde set forms near transformers and low/high voltage hydro wires as part of a project for Stuart Olson (Grandview Woodland site).

— photos by Carey Tarr


## Lack of awareness can be lethal


In the end, crews safely dismantled the project and no workers were injured, but McCollum says the potential for injury was high. “They were lucky,” he says.


McCollum points to a similar incident this year, when two young workers were positioning a 15.8-m (52-ft.) gutter on a roof and the gutter came into contact with a 14,400-V conductor. One worker died, while the second was sent to hospital.

Nair says protective gear should be the last line of defence against electrical contact. From low-voltage overhead distribution lines to high-voltage conductors, he says all workers should consider overhead wires energized and dangerous – unless reliable, prior information indicates otherwise.

Three specific injuries are associated with electricity – electric shock, arc-flash burns, and arc-blast injuries:

 **Electric shock.** Caused by electric current passing through the body. The current can cause internal bleeding, unconsciousness, respiratory paralysis, cardiac disorders, and involuntary muscle contractions.

 **Arc-flash burns.** This most common electrical injury is caused by an electrical fault occurring while working on energized electrical equipment. Arc flashes can kill at a distance of 3 m (10 ft.) Thermal burns can also occur from direct contact with hot electrical conductors or equipment, or when electrical current moves across the surface of the body.

 **Arc-blast injuries.** When an electric fault results in an explosion, the resulting pressure wave can knock workers from ladders or across a room, rupture eardrums, or collapse lungs.

## Know your limits






The key to electrical safety is to maintain a safe distance from overhead lines, as specified by Part 10 and Part 19 of the Occupational Health and Safety Regulation. Safe limits of approach vary with voltage. Remember that tools, equipment, and machinery are an extension of the workers’ reach and

workers must therefore maintain the minimum distance. Notify BC Hydro if any workers or equipment could possibly encroach upon the limits shown below.

Voltage (phase to phase)	Minimum Distance (Metres)	Minimum Distance (Feet)
751 V to 75 kV	3	10
Over 75 kV to 250 kV	4.5	15
Over 250 kV to 550 kV	6	20






## Keep your distance

If you are working in the vicinity of overhead electrical conductors or electrical equipment:

-  Determine what activities may take place near overhead lines.
-  Identify the voltage of overhead lines through BC Hydro or the local safety authority.
-  Maintain minimum clearances from lines.
-  Do not use a tape measure or tool to physically measure your distance from an overhead power line. Estimate the distance from the ground.
-  When possible, work de-energized. Call BC Hydro to decide whether the energized electrical conductors can be de-energized, effectively guarded, or rerouted.

## Avoid unnecessary risks

If you cannot maintain the minimum distance required:

-  Stop working until the power authority (BC Hydro) has been contacted.
-  Get written confirmation from BC Hydro indicating what actions they will take and when (use form 30M33, available from WorkSafeBC).
-  Inform all workers who will be affected.
-  Stay back at least 10 m (33 ft.) from a fallen power line or any object in contact with a line.
-  If your equipment contacts a line, stay put until help arrives. If it becomes necessary to exit a vehicle (e.g., due to fire), jump clear of the equipment and “bunny hop” (jump with both legs together) another 3 m (10 ft.) away from the vehicle.

## Power-smart resources

Your employer must provide training and safe work procedures for working safely around electrical hazards.



Workers at Stuart Olson's site are given clear guidelines regarding electrical safety.

— photo by Carey Tarr

⚠️ BC Hydro website: [www.bchydro.com](http://www.bchydro.com)

⚠️ BC Hydro safety training is designed for trade workers who work near high-voltage power lines, available through the Electrical Industry Training Institute.


⚠️ Electrical Contractors Association of B.C. (ECABC) conducts seminars and provides training and valuable resources ([www.eca.bc.ca](http://www.eca.bc.ca)).

⚠️ BC Electrical Association (BCEA) offers educational programs and conducts seminars ([www.bcea.bc.ca](http://www.bcea.bc.ca)).

⚠️ Electrical Industry Training Institute (EITI) provides apprenticeship and journeyman upgrading training for the electrical industry ([www.eiti.bc.ca](http://www.eiti.bc.ca)).

⚠️ Worksafe Toolbox Meeting Guides are available at [WorkSafeBC.com](http://WorkSafeBC.com).

⚠️ Form 30M33 ensures compliance with the Regulation and is available through WorkSafeBC or at [www.worksafebc.com/forms/](http://www.worksafebc.com/forms/)

⚠️ *Working Safely Around Electricity* and *Safe Work Practices for Certified Utility Arborists* are available at [WorkSafeBC.com](http://WorkSafeBC.com). 

## Stay current on safety training.

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### Safety Training programs:



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