



Ontario Coroner's Recommendations Related to Powerline Fatalities

(1993 – 2003)

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Introduction

This report is a summary of all deaths that resulted in an electrocution from direct contact with powerlines in the construction sector for the province of Ontario between 1993 and 2003. The data used in this report comes from inquests that were conducted by the Office of the Chief Coroner of Ontario. The data that was extracted from the Coroner reports and used in this report include:

- The Hazardous activity or event
- A brief description of the kind work that was being performed and what equipment or vehicles were involved?
- Jury's Recommendations

Summary

The Ontario Coroner's Office released twelve (12) inquest reports between 1993 and 2003 that involved electrocutions in the construction sector from direct contact with powerlines.

Some Basic facts for the electrocutions:

- All the fatalities involved overhead powerlines – only one (1) involved a secondary service
- 50% of the fatalities were from the activity involving “Roof or Exterior Work on Buildings or Structures”.
- The equipment involved in most of the fatalities was the Boom Truck at 34%.
- 50% of the fatalities occurred in the Public Right of Way (ROW).

Figure 1 – Electrocutions by Activity

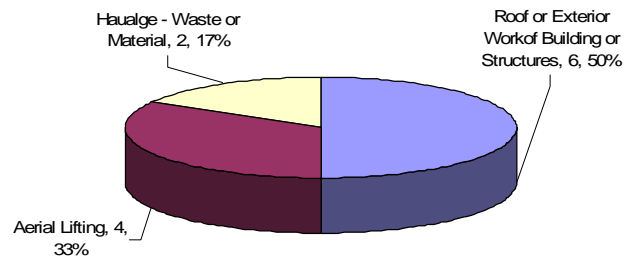


Figure 2 – Electrocutions by Equipment

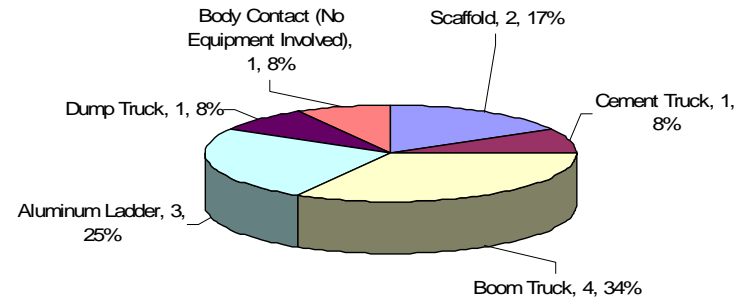
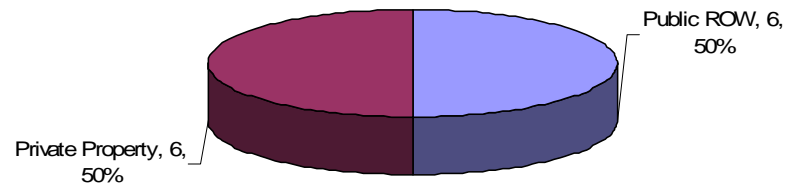


Figure 3 – Electrocutions - Private vs. Public



Summary (Cont'd)

From these twelve incidents, the Coroner's Jury made sixty-three (63) recommendations, some relevant ones included:

- Awareness and training on electrical powerline hazards to:
 - Be included in the educational curriculum from elementary through post secondary schools.
 - Emergency response personnel on the dangers of electrical contact when responding to an accident.
 - Anyone entering the trades should be made mandatory.
 - General public
- Mandatory training, licensing and periodic re-certification for operators of high reach equipment such as dump trucks, cement trucks, boom trucks and cranes to ensure safe operation.
- The use and operation of high reach equipment such as dump trucks, cement trucks, boom trucks and cranes limited to daylight hours only.
- The use of a dedicated signaler or spotter preferably with 2-way radios be mandatory for work involving high reach equipment such as dump trucks, cement trucks, boom trucks and cranes.
- No contractor or subcontractor is issued a building permit without an Occupational Health and Safety Certificate.
- Replace all metal ladders to be used outdoors with fiberglass ladders.
- Make mandatory that all LDCs must place visible signage on all hydro poles warning of the live voltage wires in all residential and commercial area.
- Manufacturers consider the possibility of installing sensor devices on all high reach equipment such as dump trucks, cement trucks, boom trucks and cranes to warn operators of high voltage powerlines.
- All construction site entrances should be posted with hazard/danger signs warning of the overhead powerlines.
- All new models of boom trucks be equipped with operating platforms to keep the operator off the ground.
- Bold print/bright colored stickers should be placed beside truck controls for all high equipment as a reminder to be cautious and check for overhead lines.
- Work procedure to be changed to require a high reach truck be not moved unless the box, boom or conveyor is in the down or retracted position.

Hazardous Activity/Event	Description	Recommendations
1 Roof or Exterior Work on Building or Structures	Painting Exterior of Building Near Primary Overhead Powerlines using a Scaffold on wheels	Safety awareness, including electrical hazards, should be included in the educational curriculum from elementary through to post secondary schools.
		Emergency response personnel should be made aware of the potential dangers of electrical contact when responding to an accident.
		Safety training for anyone entering or in the trades should be mandatory.
		The appropriate authorities should ensure that owners, employers and supervisors understand their responsibility to identify any hazards that are likely to endanger their workers.
		General public awareness should be raised in the area of electrical hazards by LDC's and other service groups.
2 Haulage - Waste or Material	Cement Truck operator washing out the conveyor belt contacted primary overhead powerline	All vehicles with the ability to come into contact with overhead hydro wires must carry warning signs instructing the operator to observe for hydro wires before operating the vehicle. Signs should be created with an illustration of the potential hazard, is made large enough and placed prominently in the operator's view.
		Emergency response personnel should have access to an emergency number with the LDCs enabling the electricity in a certain area to be shut down very quickly rather than having to go through regular hydro switchboard system.
		Workers who operate high reach equipment receive general training in electrical hazards around overhead powerlines.
3 Aerial Lifting	Operator making delivery using Boom Truck, contacted primary overhead powerlines	Mandatory training requirements for all boom truck operators with more intensive training than is presently available.
		Mandatory re-certification every 2 years.
		The use and operation of the boom truck limited to daylight hours only.
		The use of a spotter during boom operation is advisable.

	Hazardous Activity/Event	Description	Recommendations
4	Roof or Exterior Work on Building or Structures	Re-roofing work installing metal flashing when he contacted live service wire to the residence.	All LDCs in the province of Ontario inform all customers of the availability of a free Hydro shut off service, the availability of protective sleeves and the conversion of the 3 wire system to Triplex Systems on Customer's billing statements.
			All new and current employers and employees are required to take mandatory health and safety courses to obtain safety certificates.
			No contractor or subcontractor is issued a building permit without an Occupational Health and Safety Certificate.
			Communication material such as pamphlet inserts pertaining to hydro safety hazards be made available to all lumber and building supply stores.
5	Roof or Exterior Work on Building or Structures	Laborer using a aluminum ladder during home demolition / renovation contacted primary overhead powerline.	Workplace safety training - periodical updating safety standard knowledge regarding of workplace safety.
			Construction sites working in vicinity of hydro lines to contact the LDC for advice regarding warning signs that may be available to be placed on site.
			Mandatory that all ladders used for external work be made of fiber-glass instead of the metal type.

	Hazardous Activity/Event	Description	Recommendations
6	Roof or Exterior Work on Building or Structures	Laborer using a aluminum ladder during building demolition / renovation contacted primary overhead powerline.	All contractors/builders engage in the best practice of a pre-job meeting between the constructor/builder and all appropriate utilities, with particular emphasis on identifying electrical hazards and measures to ensure the safety of workers.
			The CSAO and MOL consult with appropriate agencies to consider launching public information and education campaigns concerning the hazards of overhead powerlines particularly in residential areas. These campaigns should be repeated periodically.
			All Ontario municipalities should be encouraged to develop and establish, in consultation with appropriate authorities and LDCs, by-laws that require a safe distance between new developments/renovations with respect to live overhead hydro wires.
			Make mandatory that all LDCs must place visible signage on all hydro poles warning of live high voltage wires in all residential/commercial areas.
			That the CSAO study the use of various elevated work platforms as an alternative to ladders specifically with regard to worker safety, cost and practicality.
7	Roof or Exterior Work on Building or Structures	Laborer working on side of building using an aluminum extension ladder which he was moving and contacted the primary overhead powerline.	Contractor/employer be required to ensure any work to be performed are within the minimum distances of an energized overhead conductor as set out in the regulations to the Occupational Health & Safety Act.
			That employers be required to communicate to all workers of a job site, the relevant safety standards set by law and the specific contract governing the job as well as any specific safety issues specific to that job and that such review be documented.
			That employers provide orientation to all employers about emergency procedures and that every effort be made to provide an emergency communication device.

	Hazardous Activity/Event	Description	Recommendations
8	Aerial Lifting	Operator of Boom Truck picking up scrap metal contacted primary overhead powerline.	<p>That the manufacturers of truck mounted overhead boom devices consider the possibility of installing a sensor device on booms to warn operators of high voltage powerlines.</p> <p>That construction crews avoid any stockpiling of material under or near Hydro lines.</p> <p>That operators provide, in ambulances and fire trucks, equipment such as dielectric boots, rubber gloves, insulated poles(s) and telescoping device(s) to remove a victim from an electrically dangerous area before power is turned off.</p> <p>That operators provide training for ambulance and fire department personnel in the proper use of this equipment in relation to an electrical emergency.</p> <p>That all safety regulations pertaining to the operation of cranes and overhead booms on construction sites should be made applicable to industrial sites as well.</p> <p>That there be required mandatory training, licensing, and periodic re-certification of operators of mobile cranes and boom devices to ensure safe operation.</p>
9	Roof or Exterior Work on Building or Structures	Roofer was helping others erect a pre-engineered building, he engaged in moving a scaffold mounted on wheels when it contacted primary overhead powerline.	<p>Overhead electrical wires on a construction site should be shielded or identified by one of three means: (i) insulated protective covering, (ii) A fluorescent ground marking of take or paint, 5m either side, parallel to the path of the wire, (iii) a fence or barrier, 5m either side, parallel to the path of the wire.</p> <p>All construction site entrances should be posted with hazard/danger signs warning of the existing overhead electrical wires.</p> <p>All general construction laborers and their supervisors should be required to complete a relevant and current safety course semi-annually. Employers should be responsible for maintaining an updated course log for every employee to be inspected by the MOL.</p> <p>The site supervisor and his assistant should maintain a valid First Aid-CPR training certificate at the employer's expense.</p>

	Hazardous Activity/Event	Description	Recommendations
10	Aerial Lifting	Operator of Boom Truck delivering a load of lumber to residence, his boom contacted primary overhead powerline.	<p>Operators of boom trucks and cranes shall have it's licensed employees trained with annual re-certification. Included in the training is electrical detection techniques and electrical awareness.</p> <p>All new models of boom trucks should be equipped with operating platforms to keep the operator off the ground.</p> <p>That Bold print/bright colored stickers be placed beside boom truck controls as a reminder to be cautious and check for overhead lines or other obstructions.</p> <p>Operators of boom trucks should be equipped with dielectric footwear.</p> <p>Continued research into conductor contact avoidance devices.</p> <p>That two-way radios be installed in all boom trucks and to be used with a spotter.</p> <p>Ensure outriggers/stabilizers are in locked positions before operating the boom.</p> <p>Increased education of the public regarding dangers of electricity with programs introduced into elementary school system.</p>

	Hazardous Activity/Event	Description	Recommendations
11	Aerial Lifting	Boom truck operator in the process of removing a steel board sign contacted primary overhead powerline.	<p>Before operating a boom truck a worker shall receive formalized training with the issuance of a certificate which authorizes an individual to operate the type of boom truck for which he has been qualified. The training shall include but not limited to the operation near live overhead powerlines.</p>
			<p>Training courses should not exclude similar courses already in place which could be adapted to lifting crane equipment and should include such courses as presently being established by the Ministry of Skills and Development in coordination with the Signs Association of Canada.</p>
			<p>Work procedures should be changed to require that a boom truck be not moved unless the boom is fully retracted and resting in the boom saddle</p>
			<p>Work procedure should be changed to require the hoisting wire rope be tightened with the load line hook secured to the front bumper.</p>
			<p>Proper safety apparel to be worn by any qualifies operator and should include safety boots and insulated gloves as well as proper safety helmets as recommended by MOL and CSA.</p>
			<p>Boom trucks to be maintained by the employer/owner in safe good working condition, any defects must be repaired before a boom truck is to be used.</p>
			<p>That the industry continues to develop a detection/warning device which would be available to crane and boom truck operators at a reasonable price.</p>
			<p>Place visible decals on the crane boom pointing out (i) the danger from working near powerlines, (ii) to contact the LDC when required to work within twenty-five (25) feet of live wires, (iii) proper load limit restrictions, (iv) minimum differences required for different voltages of powerlines. These decals may not be removed and must be replaced when they become faded or damaged.</p>
			<p>The Ministry of Education be requested to set up a program at the secondary level to make students aware of hazards they may encounter during summer employment particularly when working on or adjacent to electrical equipment or high tension wiring.</p>

	Hazardous Activity/Event	Description	Recommendations
12	Haulage - Waste or Material	Dump truck operator dumping fifth (5) and final load of day contacted primary overhead powerline.	Increased public education and awareness with respect to the dangers associated with electricity and powerlines and how to avoid the hazards.
			All LDCs to supply only one (1) phone number to the 911 Emergency Dispatch Personnel which will connect directly to an operator.
			Mandatory minimum workplace Health & Safety Training required under OHSA within the first week of a worker being employed in the construction industry in Ontario including the dangers associated with electricity and powerlines and how to avoid hazards.
			MOL to consult with industry stakeholders and technical experts and consider the safety benefits of: (i) using a spring loaded versus manual controls on dump trucks of various types in the Ontario, (ii) positioning the Hoist Control Box in the centre of the truck cab. The Hoist Control Box should be raised to a comfortable height to ensure the operator has clear view of all mirrors.
			MOL to consult with industry stakeholders and consider a Hazard Alert regarding the exposure to electrical hazard by contact with equipment located on or attached to the dump-box (i.e. pulley).
			MOL to consult with industry stakeholders and technical experts and consider the safety benefits and or feasibility of a sensor mounted on the dump-box that would sound an alarm or stop the movement of the box should the box get too close to any overhead hazard.
			MOL to consult with industry stakeholders and consider a Hazard Alert identifying the benefit of companies involving public and LDCs in construction project safety planning.
			All automated voice systems provided by LDCs ensure that the emergency option in the first option available.
			With reference to OHSA Regulation Section 187, subsection (3), it is recommended that the signaler have no other responsibilities or functions.