Electrical Safety – Know the Laws of Your Province

Employers must follow strict safety rules when letting workers perform work on or near electrical systems and energized equipment.

> *OHS Regulations set out strict safety rules for electrical work, including:*

- *Limits on who can perform the work;*
- *The need to isolate and lockout equipment from its electrical source before work begins;*
- *The safe work procedures that must be followed;*
- *Physical barriers and safeguards that must be in place;*
- *The safety equipment and PPE that must be used;*
- *The warning signs that must be posted;*
- *Clearance distances that must be maintained from the energized equipment or line;*
- *Requirements for control systems, wiring, grounding, electrical rooms and other equipment.*

Here's a summary of the requirements in each jurisdiction. Note: Because the OHS requirements are technical, this summary is longer and more detailed than our usual Know The Laws briefings.

Abbreviations:

- **CEC:** *Canadian Electrical Code*

- **CSA:** Canadian Standards Association

FEDERAL

(1) **If feasible,** design, construction and installation of all electrical equipment must meet CEC, Part I; operation and maintenance of all electrical equipment **must** meet CEC; (2) **Procedures:** All testing or work performed on electrical equipment must be performed by a qualified person or an employee under the direct supervision of a qualified person; if electrical equipment has a voltage over 5,200 V between any 2 conductors or in excess of 3,000 V between any conductor and ground: (a) the qualified person or employee must use insulated protection equipment and tools as to protect him from injury; and (b) the employee must be instructed and trained in use of the insulated protection equipment and tools; (3) No employee may work on electrical equipment unless it's isolated; (4) If it's not feasible to isolate the electrical equipment, employer must instruct employee in safe procedures for live conductors; if electrical equipment is not live but may live, no employee may work on the equipment unless: (a) safe procedures for work on live equipment are used; or (b) a safety ground is connected to the equipment; (5) If an employee is working on or near electrical equipment that is or may become live, it must be guarded—if guarding isn't feasible, employer must insulate the equipment from the employee or the employee from the ground; (6) Where live electrical equipment is not guarded or insulated or the employee isn't insulated from ground, employee must maintain clearance distances set out in Schedule 8.5.6

Distances from Live Electrical Parts

Column I Voltage Range of Part: Part to Ground	Column II Distance in Meters (Nonqualified Person)	Column III Distance in Meters (Qualified Person)
Over 425 to 12,000	3	0.9
Over 12,000 to 22,000	3	1.2
Over 22,000 to 50,000	3	1.5
Over 50,000 to 90,000	4.5	1.8
Over 90,000 to 120,000	4.5	2.1
Over 120,000 to 150,000	6	2.7
Over 150,000 to 250,000	6	3.3
Over 250,000 to 300,000	7.5	3.9
Over 300,000 to 350,000	7.5	4.5
Over 350,000 to 400,000	9	5.4

(7) No employee may work near a live part of any electrical equipment referred to in subsection (6) if there’s a risk that an unintentional movement by the employee could bring any part of the body of the employee or any thing with which the employee is in contact closer to that live part than the distance referred to in that subsection; (8) No employee may work on or near high voltage electrical equipment unless authorized to do so by his employer; (9) A legible sign with words “Danger – High Voltage” and “Danger – Haute Tension” in letters that are not less than 50 mm in height on a contrasting background must be posted in a conspicuous place at every approach to live high voltage electrical equipment; (10) If employee is working on or near live electrical equipment and safety dictates that the work be observed by a person not engaged in the work, the employer must appoint a safety watcher (a) to warn all employees in the work place of the hazard; and (b) to ensure that all safety precautions and procedures are complied with; (11) Safety watcher must be (a) informed of their duties as a safety watcher and of the work

hazards; (b) trained and instructed in procedures to follow in an emergency; (c) authorized to stop immediately any part of the work that they consider dangerous; and (d) free of any other duties that might interfere with their duties as a safety watcher; (12) Every employee and person working on or in connection with electrical equipment, including every safety watcher, must be fully informed by the employer with respect to the safe coordination of their work; (13) Special rules for poles and elevated structures; (14) Special requirements for isolation of electrical equipment; (15) Employee may not attach a safety ground to electrical equipment unless they test the electrical equipment and verify that it’s isolated—except for electrical equipment grounded via a grounding switch that’s an integral part of the equipment; (16) Work may not be performed on any electrical equipment in an area if the following devices are found unless the device is connected to a common grounding network: (a) a grounding bus, (b) a station grounding network, (c) a neutral conductor, (d) temporary phase grounding, or (e) a metal structure; (17) If, after the connections are made, a safety ground is required to ensure the safety of an employee working on the electrical equipment, the safety ground must be connected to the common grounding network; (18) Every conducting part of a safety ground on isolated electrical equipment must have sufficient current carrying capacity to conduct the maximum current that is likely to be carried on any part of the equipment for as long as necessary to permit operation of any device installed on the electrical equipment so that, in event of a short circuit or other electrical current overload, the electrical equipment is automatically disconnected from its source of electrical energy; (19) Point of safety grounding means (a) a grounding bus, a station grounding network, a neutral conductor, a metal structure or an aerial ground, or (b) one or more metal rods that are not less than 16 mm in diameter and are driven not less than l m into undisturbed compact earth at a minimum distance of 4.5 m from the base of the pole, structure, apparatus or other thing

to which the electrical equipment is attached or from the area where persons on the ground work and in a direction away from the main work area; (20) No safety ground may be attached to or disconnected from isolated electrical equipment unless all the following requirements are met: (a) the safety ground is, if feasible, attached to the pole, structure, apparatus or other thing to which the electrical equipment is attached; (b) all isolated conductors, neutral conductors and all non-insulated surfaces of the electrical equipment are short-circuited, electrically bonded together and attached by a safety ground to a point of safety grounding in a manner that establishes equal voltage on all surfaces that can be touched by persons who work on the electrical equipment; (c) the safety ground is attached by means of mechanical clamps that are tightened securely and are in direct contact with bare metal; (d) the safety ground is so secured that none of its parts can make contact accidentally with any live electrical equipment; (e) the safety ground is attached and disconnected using insulated protection equipment and tools; (f) the safety ground is, before it's attached to isolated electrical equipment, attached to a point of safety grounding; and (g) the safety ground is, before being disconnected from the point of safety grounding, removed from the isolated electrical equipment in such a manner that the employee avoids contact with all live conductors; (21) Every control device must be so designed and located as to permit quick and safe operation at all times, with the path of access to every electrical switch, control device or meter free from obstruction; and (22) If an electrical switch or other device controlling the supply of electrical energy to electrical equipment is operated only by a person authorized to do so by the employer, switch or other device must be fitted with a locking device that only an authorized person can activate (*COHS Regs*., Part 8)

ALBERTA

(1) If work is performed on energized electrical equipment or

lines, employer must ensure that: (a) at least 2 qualified utility employees are used to perform the work and an additional utility employee is at ground level, (b) aerial devices are equipped with both upper and lower controls, and (c) if an aerial device is used to perform the work, either an additional utility employee qualified to operate the lower controls is present at the work site at ground level or the utility employee already at the work site is qualified to operate the lower controls; (2) Subsection (1)(a) and (1)(c) DON'T apply if: (a) a professional engineer certifies that an alternative live line work procedure provides adequate utility employee protection, (b) the live line work on the electrical equipment or lines is performed by one qualified utility employee, and (c) a 2nd qualified utility employee is present at the work site at ground level; (3) Subsections (1) and (2) above DON'T apply to (a) switching work, (b) fuse replacement work, (c) phasing work, (d) measuring clearances with live line tools, (e) power quality measurements with live line tools, and (f) emergency situations in which, in order to protect life or property, a qualified utility employee performs work to eliminate the electrical hazards (*OHS Code*, Sec. 804)

BRITISH COLUMBIA

(1) A worker must be informed of potential electrical hazards before being permitted to work in near energized electrical conductors or equipment; (2) If practicable, service rooms and electrical vaults must be used only for intended purpose; (3) Passageways and working space around electrical equipment must be kept clear of obstructions, arranged so as to give authorized persons ready access to all parts requiring attention, and not be used for storage; (4) Flammable material must not be stored or placed near electrical equipment; (5) Appropriate safe work procedures must be established and followed for testing electrical equipment and circuits; (6) Special requirements for elevating work platforms for

electrical work or used near electrical hazards; (7) **Low voltage** electrical equipment must be completely disconnected and locked out as required by OHS regulation before starting work on it; If it’s not practicable to completely disconnect low voltage electrical equipment, work must be performed by qualified and authorized workers in accordance with written safe work procedures which: (a) require the use of PPE and voltage-rated tools, appropriate to hazards, (b) provide that, if practicable, uncontrolled liquid is not permitted close to any worker working on the equipment, and (c) if applicable, control the use of metal ladders, wooden ladders with wire reinforced side rails, metal scaffolds or metal work platforms; (8) Work must not be done on energized parts of electrical equipment associated with lighting circuits operating at more than 250 volts-to-ground without prior written permission of the Board; (9) Before completing installation and after energizing low voltage electrical equipment, conspicuous signs visible to workers must be placed close to the equipment stating “Danger, Energized Equipment”; (10) Uninsulated, energized parts of low voltage electrical equipment must be guarded by approved cabinets or enclosures unless the energized parts are in a suitable room or similar enclosed area that is only accessible to qualified and authorized persons; (11) Each entrance to a room and other guarded location containing uninsulated and exposed, energized parts must be marked with a conspicuous warning sign limiting entry to qualified and authorized persons; (12) If uninsulated energized parts aren’t guarded with approved cabinets or enclosures: (a) suitable barriers or covers must be provided if a worker unfamiliar with the hazards is working within 1 m (3.3 ft) of the uninsulated, energized parts, or (b) the worker must be informed of the potential hazards, and provided with and follow appropriate written safe work procedures; (13) Each electrical distribution switch, circuit breaker and control must be clearly marked to indicate the equipment it serves; (14) Portable electrical equipment having double insulation or equivalent protection, and so marked, need not

be grounded; (15) Portable electrical equipment, required to be grounded and not permanently connected to the wiring system, must be effectively grounded by the use of approved cords and polarized plugs inserted in grounded polarized receptacles; (16) When used outdoors or in a wet or damp location, portable electrical equipment, including temporary lighting, must be protected by an approved ground fault circuit interrupter of the class A type installed at the receptacle or on the circuit at the panel, unless another acceptable means of protection is provided; (17) A ground fault circuit interrupter must not be used in place of grounding except as permitted by the Electrical Safety Regulation; (18) **High voltage** electrical equipment must, if practicable, be completely isolated, grounded, and locked out as required by this Regulation before starting work on it; (19) If it is not practicable to completely isolate high voltage electrical equipment: (a) written safe work procedures acceptable to the Board must be followed, (b) 2 or more qualified and authorized persons must be present while the work is being done, unless the procedures being followed under paragraph (a) specifically permit the work to be done by one person, (c) appropriate electrical protective equipment, including rubber blankets, hoses, hoods, gloves and live line tools must be selected, used, stored, tested, and maintained in accordance with a standard acceptable to the Board, and (d) the use of metal ladders, wire reinforced side rail wooden ladders, metal scaffolds or metal work platforms must be in accordance with the procedures established under paragraph (a); (20) Before completing installation and after energizing high voltage electrical equipment, conspicuous signs visible to workers must be placed close to the equipment stating “Danger – Energized Equipment”; (21) Special isolation and lockout rules for working on a power system; (22) Before a person starts work close to high voltage electrical equipment or conductors that are exposed or that might become exposed during work at a workplace, the person must be informed of: (a) the existence, location and voltage of the high voltage

electrical equipment and conductors, and (b) the work arrangements and procedures to be followed to ensure compliance with this Part; (23) Minimum approach distance of Table 19-1A must be maintained when working close to exposed electrical equipment and conductors:

Column I Voltage Phase to Phase	Table 19-1A Column 2 Minimum approach distance for working close to exposed electrical equipment or conductors	
	Meters	Feet
750 V to 75 kV	3	10
75 kV to 250 kV	4.5	15
250 kV to 550 kV	6	20

(24) Minimum approach distances of Table 19-1B apply if a person working at a workplace is moving or is involved in moving equipment under exposed electrical equipment or conductors and is not performing any work other than work related to moving the equipment.

Table 19-1B

Column I Voltage Phase to Phase	Column 2 Minimum approach distance for passing under exposed electrical equipment or conductors	
	Meters	Feet
750 V to 75 kV	2	6.5
75 kV to 250 kV	3	10
250 kV to 550 kV	4	13

(25) If minimum distance in Table 19-1A can’t be maintained due to work circumstances or the inadvertent movement of persons or equipment, an assurance in writing on a form acceptable to the Board and signed by a representative of the owner of the power system, must be obtained stating that while the work is being done the electrical equipment and conductors will be displaced or rerouted from the work area, if practicable; (26) If compliance with subsection (25) isn’t practicable, the assurance must state that the electrical equipment will be isolated and grounded, but if isolation and

grounding is not practicable the assurance must state that the electrical equipment will be visually identified and guarded; (27) The safeguards specified in the assurance must be in place before work commences and effectively maintained while work is taking place; (28) If guarding is used: (a) neither equipment nor unqualified persons may touch the guarding, and (b) a safety watcher must be designated, or range limiting or field detection devices acceptable to the Board must be used; (29) The assurance must be available for inspection at the workplace, as close as practicable to the area of work, and must be known to all persons with access to the area; (30) If exposed high voltage electrical equipment and conductors can't be isolated, rerouted or guarded, work must not be done within the minimum distance in Table 19-1A until the following precautions are taken: (a) the area within which equipment or materials are to be moved must be barricaded and supervised to restrict entry only to those workers necessarily engaged in the work; (b) a safety watcher must be designated; (c) a positive means must be provided for the safety watcher to give a clear, understandable stop signal to workers in the area, and the watcher must give the stop signal by no other means; (31) While equipment is in motion in an area in proximity to energized electrical equipment or conductors, no person other than the equipment operator may touch any part of the equipment or the material being moved by it; (32) No person may move a load or any rigging line from its position of natural suspension if it is in proximity to an energized electrical conductor or equipment; (33) A worker who has taken a course of instruction approved by the Board may work up to the adjusted limits of approach in Table 19-2 when all the following conditions apply: (a) the high voltage electrical equipment is energized to a potential of not more than 75kV; (b) the Board has determined that rerouting, de-energizing or guarding of the equipment is not practicable for the type of work performed; (c) the work isn't being done for the owner of the power system; (d) the work is of a type that must be done regularly; (e) the worker follows written safe work procedures

acceptable to the Board; (34) A qualified electrical worker may work closer than the limits specified in Table 19-2 provided the worker is authorized by the owner of the power system and uses procedures acceptable to the Board

Table 19-2:

Column I Voltage Phase to Phase	Column 2 Minimum distance	
	Meters	Feet
750 V to 20 kV	0.9	3
20 kV to 30 kV	1.2	4
30 kV to 75 kV	1.5	5

And (35) Exceptions to the above apply for emergency actions, provided that required safety measures are taken (*OHS Reg*., Part 19)

MANITOBA

(1) If a defect or unsafe condition is identified in electrical equipment, an employer must ensure that: (a) steps are immediately taken to protect the safety and health of any worker who may be at risk; and (b) the defect is repaired or the unsafe condition is corrected as soon as reasonably practicable; (2) Employer must: (a) develop and implement safe work procedures for electrical work; (b) train workers who do electrical work in safe work procedures; and (c) ensure that workers comply with those safe work procedures; (3) Employer must develop and implement emergency procedures to be followed if an electrical worker or other person may come in contact with exposed energized electrical equipment and that contact may affect his or her safety or health, including procedures to be followed for rescuing, administering first aid and obtaining further medical assistance for the worker; (4) Employer must ensure that workers who will implement the emergency procedures are trained in the procedures; (5) Employer must ensure that, in the workplace, only an electrical worker performs electrical work; (6) Employer must

ensure that the electrical work performed in the workplace conforms to the requirements of (a) The *Electricians' Licence Act* ; (b) the *Manitoba Electrical Code*; and (c) where applicable, the by-laws of the municipality; (7) Employer and owner must ensure that energized electrical equipment is suitably located and guarded so that it isn't contacted by a worker; (8) When work is being done near exposed, energized electrical equipment, an employer must ensure that the work is done in a manner that prevents a worker from contacting the equipment; (9) If a defect or unsafe condition is identified in electrical equipment, employer must ensure that: (a) steps are immediately taken to protect the safety and health of any worker who may be at risk; and (b) the defect is repaired or the unsafe condition is corrected as soon as is reasonably practicable; (10) Where an unsafe condition is identified in a portable power cable, cable coupler or cable component, an employer must ensure that the cable, coupler or component is repaired or removed from service; (11) Employer and owner must ensure that: (a) each electrical panel and switch controlling a service supply, feeder or branch circuit is protected from physical or mechanical damage and is (i) securely mounted in a vertical position to a substantial support in an area free from an accumulation of water, (ii) readily accessible to an electrical worker and clear of any obstructions, and (iii) fitted with an approved cover over any uninsulated part carrying a current and an approved filler in any unused opening; and (b) electrical distribution switches, including main circuit breakers, have a suitable means for being locked-out in the open or de-energized position; (12) Employer must ensure that (a) a cable or wire used for temporary electrical distribution at a workplace is adequately guarded or securely suspended overhead to provide adequate clearance for workers and material; (b) a temporary light or other temporary electrical device (i) is assembled, installed and maintained in a safe manner and in accordance with the manufacturer's instructions, if any, (ii) is suitably located and guarded to prevent damage to the lamp or device, and (iii) if suspended,

is suspended by its electrical cord only if designed to be suspended in that manner; (c) an electrical extension cord used by a worker is (i) of an approved type with a proper grounding connection, (ii) visually inspected each day before it is used for possible damage and repaired or replaced, if necessary, (iii) not used if the grounding post has been removed or made inoperative, and (iv) where it passes through a work area, covered or elevated to protect it from damage and prevent a tripping hazard; and (d) a receptacle for an attachment plug has a concealed contact and is properly grounded; (13) When work is done in a damp location or in a metallic enclosure, including a drum, tank, vessel or boiler, an employer must ensure that electrical circuits are protected by a class “A” ground fault circuit interrupter; (14) Employer and owner must ensure that, where high voltage electrical switch gear or transformers are located in a workplace, (a) access to the gear or transformers is restricted to persons authorized by the employer; and (b) a warning sign is posted; (15) Employer must ensure that no worker locks or otherwise fixes an electrical switch in the closed or energized position unless the design specifications of the switch require it to remain locked in the closed position; (16) Employer must ensure that an electrical worker doing electrical work (a) de-energizes and locks-out electrical equipment on which work is to be done in a manner that meets the requirements of Part 16 (Machines, Tools and Robots); (b) removes any potential stored power; and (c) does not re-energize the equipment until the work has been completed and all persons in the immediate vicinity are in a safe location; (17)

If it’s not reasonably practicable to de-energize electrical equipment before electrical work is done, an employer must ensure that no electrical worker begins work on energized electrical equipment until (a) the employer, in consultation with the worker, has (i) assessed the conditions or circumstances under which the electrical worker is required to work, and (ii) developed safe work procedures that include the

use of safety equipment appropriate for the task; (b) the safe work procedures developed under subclause (a)(ii) have been agreed to by the employer and the worker; (c) the worker has been trained in the safe work procedures; (d) the employer has designated a worker who is trained in emergency response procedures as a standby worker at the location where the electrical work is to be done; (e) the standby worker is present at the location where the work is to be done; and (f) the worker wears all personal protective equipment appropriate for the work to be done; (18) The standby worker must be present at the location of the electrical work at all times when the work is being done; (19) This section doesn't apply to electrical equipment that (a) operates at extra-low voltage – being voltage of 30 volts or less; and (b) when energized, is not considered a risk to the safety or health of a worker; (20) Employer must ensure that the environmental conditions at a workplace are assessed to determine (a) the type of protection required to safely use electrical equipment and electrical tools; and (b) the appropriate electrical equipment and electrical tools to be used at the workplace; (21) Employer must ensure that a worker only uses electrical equipment and electrical tools (a) in accordance with the manufacturer's specifications; and (b) that are properly grounded, unless the electrical equipment and tools are double-insulated or bear a CSA certified label (*WSH Regs*., Part 38)

NEW BRUNSWICK

(1) Employer must ensure that employees don't work on energized electrical equipment, on an energized electrical utility line or utility line equipment or closer to an energized electrical utility line or utility line equipment than the applicable distance set out in subsection 289(1) of the OHS Regs. (and the Table below) unless they're a "qualified person"; (2) Employer must ensure that the entrance to a room containing an electrical hazard is marked with

conspicuous warning signs, symbols or tags stating that entry by unauthorized persons is prohibited; (3) Employer must ensure that no person enters or is permitted to enter a room or other enclosure with electrical hazards unless the person is: (a) a qualified person, or (b) an employee who enters the room or enclosure to complete a duty not involving an electrical hazard and the employee is instructed and trained in the electrical hazards; (4) Employer must ensure that electrical equipment and insulating material for electrical equipment is suitable for its use and installed, maintained, modified and operated in accordance with the manufacturer's specifications; (5) Employer must ensure that electrical equipment has a means of isolating its energy source and that the energy source is: (a) lockable, (b) situated in a location familiar to all employees, and (c) properly identified; (6) Employer must provide a safety lock and key to a qualified person who may be required to lock out the electrical equipment; (7) Employer must establish a written lock out procedure for electrical equipment and ensure that a qualified person who may be required to lock out the electrical equipment is adequately instructed and trained to lock out the electrical equipment; (8) Employer must ensure that before a qualified person works on electrical equipment: (a) an electrically safe work condition is established, and (b) each qualified person who will be working on the electrical equipment (i) verifies that an electrically safe work condition is established, (ii) locks out the electrical equipment using the safety lock and key provided by the employer, and (iii) puts a non-conductive tag on the safety lock that contains (A) words directing persons not to start or operate the electrical equipment, (B) the qualified person's printed name and signature, and (C) the date and time when the tag was put on the safety lock; (9) Before working on electrical equipment, a qualified person must verify that the requirements set out above have been complied with; (10) No person may remove a safety lock or tag on electrical equipment except (a) the person who installed the safety lock or tag, or

(b) in an emergency or, when attempts are made to contact the person referred to in paragraph (a) and the person is not available, a qualified person designated by the employer; (11) Employer and a qualified person must each ensure that all testing and troubleshooting of electrical equipment is conducted in an electrically safe work condition and that the instruments, equipment and accessories used to test and troubleshoot electrical equipment are in good working condition and are rated for the circuits and electrical equipment to be worked on; (12) When circumstances don’t permit an electrically safe working condition to be established before working on or near energized exposed parts of electrical equipment, employer must ensure the work is carried out by a qualified person and the employer and qualified person must each ensure that a code of practice referred to below is established; (13) A code of practice for work on or near energized exposed parts of electrical equipment must be in writing and contain: (a) clearly established responsibilities and accountabilities for each person who may be exposed to electrical hazards; (b) a description of the circuit and electrical equipment to be worked on, their location, the work to be performed and the electrical hazards and other associated risks; (c) a justification for why the work needs to be performed in an energized condition; (d) the safe work procedures to be followed; (e) the voltage to which persons will be exposed; (f) a description of the PPE and other protective equipment to be used; and (g) a description of the means employed to restrict the access of unqualified persons to the work area; (14) Employer must use CSA Standard Z462-15, “Workplace electrical safety” or standard offering equivalent or better protection as a guide for the selection of personal protective equipment and other protective equipment that employees are required to use; (15) Before commencing work on or near energized exposed parts of electrical equipment, an employer or a contractor shall inform the employees involved in the work of the content of the code of practice and the supervisor

shall document the communication of the information; (16) Whenever there’s a change in the electrical equipment, an employer and a contractor shall each ensure that a new code of practice is established for the electrical equipment that contains the information set out above; (17) Employer must ensure that a copy of the code of practice is readily available to employees; (18) Employer must comply with the code of practice and ensure that employees do too; (19) Employer must ensure that main service switches and temporary panel boards of electrical equipment: (a) are securely mounted on sufficient supports on an upright position, (b) are kept clear of any obstructions for one metre in front and two metres headroom, (c) are within easy reach of and readily accessible to authorized persons, (d) are adequately protected from weather and the accumulation of water, (e) have a suitable cover over uninsulated energized parts, and (f) have a label or other indicator that identifies what equipment is energized by each line; (20) Employer must ensure that electrical equipment that is no longer in use (a) is de-energized and removed, or (b) if left in place, is tagged as no longer in use, and (i) is locked out, (ii) its conductors are disconnected and effectively grounded, or (iii) its conductors are disconnected and removed; and (21) Employer must ensure that employees don’t work on an energized electrical utility line or utility line equipment or closer to an energized electrical utility line or utility line equipment than the applicable distance set out in subsection 289(1) unless they use rubber gloves, shields, insulated objects or other necessary protective equipment:

Phase to Phase Voltage of Energized Electrical Utility Line or Utility Line Equipment	**Distance**
Up to 750 Volts	900 mm (3 feet)
750 Volts to 100,000 Volts	3.6 m (12 feet)
100,001 Volts to 250,000 Volts	5.2 m (17 feet)

250,001 Volts to 345,000 Volts	6.1 m (20 feet)

(*OHS Gen. Reg.,* Secs. 287-289)

NEWFOUNDLAND

(1) Electrical installation, equipment, apparatus and appliance must meet CEC as adopted in the *Electrical Regulations* under the *Public Safety Act*; (2) Only a worker qualified to work on electrical conductors and equipment may be authorized to do the work; (3) Work must not be done on an energized electrical conductor or equipment unless a hazard assessment is completed that includes determining the number of qualified workers that should be present while the work is being performed; (4) Special requirements for poles and elevated structures; (5) Where practicable, a service room or electrical vault must be used only for the purpose for which it was intended; (6) Passageways and working space around electrical equipment: (a) must be kept clear of obstructions and arranged to give authorized persons ready access to all parts requiring attention; and (b) must not be used for storage; (7) Flammable material must not be stored or placed close to electrical equipment; (8) A worker must not use oil-base paint or other volatile flammable substance in an electrical substation or confined area where high voltage electrical current passes through; (9) Electrical test equipment may be used by qualified workers if it meets: (a) CSA C22.2 No. 160, “Voltage and Polarity Testers”; or (b) CSA CAN/CSA -22.2 No. 231 Series-M89, CSA “Safety Requirements for Electrical and Electronic Measuring and Test Equipment”; (10) Appropriate safe work procedures must be established and followed for testing electrical equipment and circuits; (11) **Low voltage** electrical equipment must be completely disconnected and locked out where required by Part IX of the OHS Regs. before work starts on it; (12) If it’s not practicable to completely disconnect low voltage electrical equipment, work must be performed in accordance with an

electrical safety program in accordance with a standard acceptable to the minister that: (a) includes emergency procedures and emergency release of victims; (b) requires the use of appropriate electrical protective equipment, including flame retardant clothing, voltage-related rubber gloves and cover up and other necessary live line tools; (c) provides that, where practicable, uncontrolled liquid isn’t permitted close to a worker working on the equipment; (d) prohibits the use of metal ladders, wooden ladders with wire reinforced side rails, metal scaffolds or metal work platforms; and (e) has available up to date diagrams; (13) Before completing installation and after energizing low voltage electrical equipment, conspicuous signs visible to a worker must be placed close to the equipment stating “Danger, Energized Equipment”; (14) Uninsulated, energized parts of low voltage electrical equipment must be guarded by approved cabinets or enclosures unless the energized parts are in a suitable room or similar enclosed area that’s accessible only by qualified persons; (15) An entrance to a room or other guarded location containing uninsulated and exposed energized parts must be marked with a conspicuous warning sign limiting entry; (15) Where uninsulated energized parts aren’t guarded with approved cabinets or enclosures: (a) a suitable barrier or cover must be provided where a worker unfamiliar with the hazards is working within the limited approach boundary of 1.07 metres of the uninsulated, energized parts; or (b) a worker must be informed of the potential hazards and provided with and follow appropriate written safe work procedures; (16) An electrical distribution switch, circuit breaker and control must be clearly marked to indicate the equipment it serves; (17) Portable electrical equipment having double insulation or equivalent protection and so marked, need not be grounded—however, portable electrical equipment that is required to be grounded and not permanently connected to the wiring system, must be effectively grounded by the use of approved cords and polarized plugs inserted in grounded polarized receptacles; (17) When used outdoors or in a wet or

damp location, portable electrical equipment must be protected by an approved, CSA Certified, ground fault circuit interrupter; (18) A ground fault circuit interrupter must not be used as a substitute for grounding; (19) **High voltage** electrical equipment must, where practicable, be completely isolated, grounded and locked out where required by these regulations before work on it starts; (20) If it's not practicable to completely isolate high voltage electrical equipment an employer must conduct a formal hazard assessment and develop an electrical safety program that includes: (a) written safe work procedures; (b) the number of qualified persons required to be present while the work is being done; and (c) providing appropriate electrical protective equipment, including rubber blankets, hoses, hoods, gloves and live line tools that shall be selected, used, stored, tested and maintained in accordance with a standard acceptable to the minister; (21) A worker must not work on an energized electrical conductor or equipment, unless procedures satisfactory to the minister are used and the worker is provided with and trained in the use of special tools, approved for use by an authority acceptable to the minister; (22) Before completing installation and after energizing high voltage electrical equipment, conspicuous signs visible to a worker must be placed close to the equipment stating "Danger, Energized Equipment"; (23) Before working on a high voltage power system that, for reasons of safety, must be de-energized, the worker in charge must ensure that the part of the system being worked on is isolated and grounded and locked out where required by OHS regulations; (24) A barrier or other form of distinctive identification must be used to differentiate high voltage electrical equipment which has been de-energized for safety reasons from similar energized equipment at the work location where a lack of identification would result in undue risk to workers; (25) If it's impracticable to lock out a power system or part of a power system: (a) the boundaries of the power system or part must be clearly defined; (b) written work procedures respecting safety

protection guarantees must be followed; and (c) major equipment used to establish safety protection guarantees must be uniquely identified at a conspicuous place on or near the equipment; (26) Only one person at a time must be assigned as the person in charge with the exclusive authority to establish the conditions for, and to issue safety protection guarantees for, the power system or part of it and that person in charge must: (a) ensure that the status of the power system or assigned part of the power system is accurately represented on a mimic display; (b) maintain a log of switching details, safety protection guarantees and operational events; and (c)authorize the commencement of work on the power system or assigned part of it; (27) There must be an effective communication system between the person in charge and workers doing the work; (28) Only a worker specifically authorized by an owner may receive a safety protection guarantee or do work on the power system or assigned part of the power system; (29) Where a switching sequence requires the operation of 3 or more devices, a written switching order must be prepared and followed; (30) An isolating device used to provide a safety protection guarantee must provide for visual verification of the opening of an isolation point; (31) A lockable isolating device must be locked in the position or condition required to protect a worker before work commences under a safety protection guarantee; (33) A distinctive “DO NOT OPERATE” tag must be placed securely on an isolating device used for a safety protection guarantee; (1) While a safety protection guarantee is in effect, the equipment to be worked on must be tested to verify isolation before grounding and blocking begin; (34) After the testing is done, the person at the worksite responsible for a crew must verify that the required grounding and blocking devices are in place before work begins; (35) Grounding and blocking of equipment that may be hazardous to workers must be carried out as closely as practicable to the worksite; (36) Where grounding and blocking isn’t safe or practicable, written safe work procedures acceptable to the minister must be followed; (37) Grounding

and blocking devices may be removed for the purpose of conducting tests after lockout procedures have been followed; (38) Special rules and procedures required for work involving 2 or more power systems or 2 or more people in charge of different parts of a system; (39) Minimum clearance distances required from energized high voltage electrical equipment; (40) Special requirements for tree pruning operations; (41) A control system must be designed, installed, operated and maintained by a qualified person in accordance with a standard acceptable to the minister; and (42) Special requirements apply to control systems (*OHS Regs*., Secs. 477 to 510)

NOVA SCOTIA

(1) Employer must ensure that an electrical installation is designed, installed, assembled, operated, inspected, serviced, tested, maintained, repaired and dismantled in accordance with the latest version of CSA standard CSA C22.1, "CEC Part 1", Safety Standard for Electrical Installations"; (2) Employer must ensure that a power line or power line equipment is designed or constructed to comply with the latest version of: (a) CSA C22.3 No.1, "Overhead Systems"; or (b) CSA C22.3 No. 7, "Underground Systems"; (3) Subject to the Underground Mining Regulations made under the Act, employer must ensure that the voltage and voltage variation of a power line or power line equipment is limited at the service entrance in accordance with the latest version of CSA CAN3-C235, "Preferred Voltage Levels for AC Systems, 0 to 50,000 V"; (4) Employer must ensure that a person who works on an electrical installation is a competent person; (5) Electrical PPE must meet requirements set out in Section 123; (6) Employer must ensure that a person who handles an energized power line or power line equipment rated at greater than 15 000 v to ground uses hot line tools to do so, in addition to other PPE required in the circumstances; (7) A person may use rubber gloves instead of hot line tools to handle energized power lines or power line equipment rated at greater than 750 v

phase to phase, where a written work procedure has been adopted as a code of practice by order of the Director for use in such circumstances; (8) An employer who has adopted a code of practice under subsection must: (a) provide a copy of the code of practice to each person in the workplace required to handle energized power lines or power line equipment rated at or below 15 000 v to ground; (b) provide training in the code of practice to each person in the workplace required to handle energized power lines or power line equipment or perform other activities in accordance with the code of practice; and (c) communicate the details of the code of practice and the reasons for its implementation to all persons at the location where the work is performed, and, to the extent that it relates to their work, all persons must adhere strictly to the terms of the code of practice; (9) Employer must ensure that no work is performed on an energized electrical installation rated at greater than 750 v phase to phase unless the competent person performing the work is accompanied by another competent person. **Exception:** Subsection (2) doesn't apply to switching work carried out using a switching device where an adequate written procedure has been established by the employer; (10) If compliance with the PPE requirements and normal work procedures in effect at the workplace is inadequate to control the risk of exposure to an electrical hazard during work on an energized electrical installation due to an unusual factor in the nature of the work, such as the location or condition of the workplace, a competent person not actively engaged in the work must be designated as a safety watcher to observe a person working on or near an energized electrical installation who's responsible for: (a) warning all persons working on or near an energized electrical installation of any potential hazards; b) ensuring that the OHS requirements (of Part 11) are complied with; (c) being a competent person able to evaluate relevant hazards, and competent and equipped to initiate a rescue; (d) being free of any other duties that might interfere with the duties outlined in this subsection; (e) having the authority to stop work

where the task or conditions in the workplace become hazardous; and (f) remaining in the immediate vicinity of the work; (11) Special overhead powerline and clearance distance requirements; (12) The owner of a building or structure must ensure that a plan is created, maintained and updated by a competent person if there's an electrical installation utilized in the building or structure that meets any of the following criteria: (a) it's rated at greater than 250 v phase to phase; (b) it's rated at greater than 250 amp; (c) it has multiple service entrances; (13) The above plan must include a line diagram that: (a) describes the position and ratings of the components of the electrical installation; and (b) reflects all repairs and alterations to the electrical installation; (14) Where a workplace has an electrical room, employer must ensure that: (a) the room is kept clean and orderly; (b) the room isn't used for storage of unrelated materials; and (c) where the components are rated at more than 750 v phase to phase, a sign is posted on the outside of the room that legibly states "Danger – High Voltage"; **Exception:** No sign required where an electrical room is in a manhole controlled and maintained by an authority (*WHS Regs.*, Part 11)

ONTARIO

(1) Electrical equipment, insulating materials and conductors must be: (a) suitable for their use; and (b) certified by, (i) the Canadian Standards Association, or (ii) the Electrical Safety Authority, as defined in the *Electricity Act, 1998*; (2) The entrance to a room or similar enclosure containing exposed live electrical parts must have a conspicuous sign, warning of the danger, and forbidding entry by unauthorized persons; (3) The power supply to electrical installations, equipment or conductors must be disconnected, locked out of service and tagged before any work is done, and while it's being done, on or near live exposed parts of the installations, equipment or conductors; (4) Before beginning the work, each worker must

determine if the requirements of subsection (3) have been complied with; (5) Locking out not required: (a) if the conductors are adequately grounded with a visible grounding mechanism; or (b) if the voltage is less than 300 volts and there is no locking device for the circuit breakers or fuses and procedures are in place to ensure that the circuit isn't inadvertently energized; (6) If locking out not required for the reason set out in clause (5)(b), the employer must ensure that the procedures required by that clause are carried out; (7) If more than one worker is involved in the work , the worker who disconnected and locked out the power supply must communicate the purpose and status of the disconnecting and locking out; (8) If a tag is used as a means of communication, the tag, (a) must be made of non-conducting material; (b) must be secured to prevent its inadvertent removal; (c) must be placed in a conspicuous location; (d) must state the reason the switch is disconnected and locked out; (e) must show the name of the worker who disconnected and locked out the switch; and (f) must show the date on which the switch was disconnected and locked out; (9) The employer must establish and implement written procedures for compliance with this section; (10) These subsections 10 to 12 apply instead of subsections (3) to (9) above if it's not practical to disconnect electrical installations, equipment or conductors from the power supply before working on, or near, live exposed parts of the installations, equipment or conductors; (11) The worker must use rubber gloves, mats, shields and other protective equipment and procedures adequate to ensure protection from electrical shock and burns while performing the work; (12) If the installation, equipment or conductor is operating at a nominal voltage of 300 volts or more, a suitably equipped competent person who's able to recognize the hazards and perform rescue operations, including artificial respiration, must be available and able to see the worker performing the work; **Exception:** Subsection (12) doesn't apply to equipment testing and trouble-shooting operations; (13) Work performed on electrical transmission systems or outdoor

distribution systems rated at more than 750 volts must be performed in accordance with the document entitled “Electrical Utility Safety Rules”, published by the Infrastructure Health and Safety Association and revised in 2019; (14) Tools and other equipment that are capable of conducting electricity and endangering the safety of any worker must not be used in such proximity to any live electrical installation or equipment that they might make electrical contact with the live conductor; (15) Cord-connected electrical equipment and tools must have a casing that’s adequately grounded, except for: (i) cord-connected electrical equipment or tools that are adequately double-insulated and whose insulated casing shows no evidence of cracks or defects or (ii) a portable electrical generator in which the electrical equipment or tools aren’t exposed to an external electric power source if the casing of portable electrical equipment or tools connected to the generator is bonded to a non-current-carrying part of the generator; (16) When used outdoors or in wet locations, portable electrical tools must be protected by a ground fault circuit interrupter installed at the receptacle or on the circuit at the panel; and (17) A ground fault that may pose a hazard must be investigated and removed without delay (*OHS Ind. Ests. Reg*., Secs. 40 to 44)

PRINCE EDWARD ISLAND

(1) Employer must ensure that workers don’t work on any energized electrical conductor or equipment unless they’re: (a) competent; or (b) an indentured apprentice under the direct supervision of a competent person; (2) Employer must ensure that when communication workers required to work on energized electrical utility conductors or equipment are competent; (3) Employer must ensure that installation, use and maintenance of any electrical wiring or equipment including temporary wiring, complies with *Electrical Inspection Act* and regulations (EIA); (4) Employer must ensure that all newly installed electrical utility and communication lines and

equipment are installed in conformance with CSA C22.3 No.1-15, Overhead Systems, and CSA C22.3 No.7-20, Underground Systems; (5) Employer must ensure that workers don't work on energized electrical conductors or equipment unless adequate protective devices specified for protection against the voltage involved are used—special requirements for protective gloves; (6) Employer must ensure that no worker works on any energized electrical conductor or equipment operating at more than 3,000 v, unless procedures satisfactory to the Director are used, and the workers are provided with and trained in the use of special tools which are approved for use by an authority acceptable to the Director; (7) No work may be done on an energized electrical line or equipment at a voltage more than 600 v unless 2 or more workers are present while the work is performed; **Exception:** Doesn't apply to the fusing of transformers where the transformer fuses are accessible without passing or reaching past electrical wires or appliances carrying more than 240 v; nor to work done with special tools that are designed for the purpose, and which are used by workers who've been trained in the use of those tools; (8) No work may be done or allowed in tunnels and manholes on an energized electrical line or equipment having a voltage of more than 240 unless there are at least 2 competent workers present; (9) No work may be done in or around any place or structure in proximity to energized electrical wires or equipment which are normally isolated by position or elevation, unless such electrical lines or equipment are provided with guards that effectively prevent contact by any worker or by any equipment being used or handled and that meet the specifications of an authority acceptable to the Director; (10) Notices reading "Danger-High Voltage" must be placed in prominent positions near electrical equipment operating at over 600 v that may be accessible to workers; (11) Employer must ensure that that before a worker is permitted to work on electrical conductors or equipment that must be de-energized, the worker in charge of the work must open, lock and tag any switching device which supplies electrical energy to the

conductors or equipment being handled; (12) Employer must ensure that before a worker is permitted to work on electrical utility lines or equipment that must be de-energized, the worker in charge of the work must ensure that such are properly de-energized; (13) After work has been completed on de-energized electrical conductors, utility lines or equipment, the worker in charge of the work must: (a) determine that all workers are clear of work areas; and (b) authorize the energizing of the electrical conductors, utility lines or equipment; (14) Employer must ensure that workers don’t work in or around any place or structure in proximity to energized electrical conductors or equipment unless: (a) adequate protective guards are provided; or (b) the workers are wearing adequate protective equipment; (15) Employer must ensure that workers don’t work on any energized electrical conductor or equipment having a potential in excess of 600 v in a manhole or tunnel unless they have continual communications with another competent worker; (16) Employer must ensure that manholes containing energized electrical conductors or equipment are provided with approved insulated mats or platforms to protect workers while at work, except those manholes containing only telephone, telegraph, signal wires or cables; (17) Employer must ensure that tunnels or manholes containing energized conductors or equipment are kept free from water, sewage or other drainage when it’s necessary for workers to enter; (18) Employer must ensure that means of access to all electrical switching devices shall be kept clear of obstructions; (19) Special rules apply to work on poles and other structures; (20) Employer must ensure that, except for electrical utilities, a worker doesn’t carry out any work which is liable to bring any person or apparatus, machine, machine component, material or property within a distance of energized electrical conductors closer than as specified in the following table:

Phase to Phase Voltage of Energized Electrical Utility Line or Utility Line Equipment	Distance
Up to 750 Volts	.90 m (3 feet)
751 Volts to 100,000 Volts	3.60 m (12 feet)
100,001 Volts to 250,000 Volts	5.20 m (17 feet)
250,001 Volts to 345,000 Volts	6.10 m (20 feet)

(21) Employer must ensure that when structural repairs, extensions, paint work or other similar work is done near energized electrical conductors or equipment, the employer in charge of the work ensures that (a) the conductors are properly de-energized; or (b) the energized electrical conductors or equipment are adequately insulated or guarded; (22) Employers must ensure that metal ladders and ladders having reinforcing wire or other conducting material aren't used near energized electrical conductors or equipment; (23) Employer must ensure that hand tools, such as pliers, screw drivers, fuse pullers, etc., for use in connection with electrical work, are adequately insulated and of an approved type; (24) Employer must ensure that temporary wiring is carried out in accordance with the EIA; (25) Employer must ensure that where portable electric conductors are used, a sufficient number of fixed outlets are installed at safely accessible points; (26) Employer must ensure that rubber covered cord is used for portable electrical tools, extension lamps, etc., which may be subjected to hard usage and strand wire isn't used for temporary wiring; (27) Employer must ensure that armouring and sheathing of electric cables, metal conduits and their fittings, metallic safeguards and other non-current carrying metal parts of electrical equipment are effectively grounded; (28) Employer must ensure that grounding conductors is of low resistance and of sufficient capacity to safely carry the heaviest flow of current which may result from a breakdown of the insulation of the equipment to be protected and that grounding conductors are mechanically protected at places where they're likely to be damaged; (29)

Employer must ensure that where it’s impossible or impracticable to enclose electrical circuits or current-carrying parts of electrical equipment operating at 50 v AC or more to ground, accidental contact by persons or objects is prevented by installing the circuits or equipment in rooms or enclosures which are accessible to authorized persons only or on balconies, galleries or platforms so elevated and arranged as to exclude unauthorized persons; (30) Employer must ensure that means of access to switches and meters are clear of obstructions at all times and that all electrical distribution switches and controls are clearly marked to indicate the machinery or equipment which they serve; (31) Employer must ensure that before workers are required or permitted to work on any part of an electrical power system which, for reasons of safety, must be handled in a de-energized condition, the worker in charge ensures that the part of the system being worked on is deenergized and grounded, and that the controls are tagged and locked to prevent the system from being re-energized; (32) Employer must ensure that when control devices aren’t under the direct control of the workers, workers receive assurance from the worker in charge of the control device that the work may safely proceed and the assurance is recorded by the worker giving the assurance; (33) Before starting the work on the de-energized part of the system, the worker must, by short-circuiting and grounding or other effective means, ensure that the part or section is deenergized and that all workers are protected against re-energization; (34) Employer must take every practicable step to prevent danger to persons on the work site from any live electrical conductor or apparatus that might be a source of danger; (35) No person may use any electric tool unless it is effectively grounded or is of the double insulated type. (EC180/87); (36) Employer must ensure that a main service switch and secondary electrical panel are (a) securely mounted on substantial supports; (b) kept clear of any obstruction for 1 000 mm (3.2 ft.) to the front; and (c) within easy reach of and readily accessible to authorized persons; (37) Employer

must ensure that a service switch has a suitable device for locking it in the open position; and (38) Employer must ensure that all areas in which workers are employed and the means of access thereto are adequately lighted (*OHS Regs*., Sec. 36)

QUÉBEC

(1) An electrical appliance, electric tool or conductor may be used only for the purposes for which it was designed; (2) An electrical appliance or electric tool must be bonded or have double insulation; (3) Electrical extension cords must: (a) have a bonding conductor; (b) be designed for outdoor use; (c) be of the Hard Usage type for a circuit 300 V or less, or of the Extra-Hard Usage type for a circuit 600 V or less; and (d) have a capacity at least equal to the value of the circuit overcurrent device; (4) Where an extension cord is suspended, the suspension height must allow free passage and supports for suspending the extension cord must not be conducting or sharp; (5) An extension cord passing on a floor must be protected to avoid any damage or reduce risks of tripping; (6) An extension cord not in use must be disconnected and stored and an extension cord with a broken, defective or repaired element must not be used and must be removed from the construction site; (7) Except where an energy control method provided for in subdivision 2.20 is applied, the components of an electrical circuit of more than 30 V must be protected to avoid any contact with a live element; (8) T)he switch of a service box, a feeder or a branch circuit must not be locked when it’s in the energized position; (9) A 15A or 20A circuit at 125 V supplying an appliance or a cord tool must be protected by a Class A ground fault circuit interrupter; (10) A temporary electrical installation must not be interconnected to the circuit of a permanent electrical installation, unless an appropriate warning is posted at all interconnection points or other locations that constitute a danger; and (11) The distribution panel of a connection of a temporary outdoor electrical installation must be weatherproof

and the ground in front and on each side of the panel must be leveled, drained and free of obstructions to a distance of at least 1 m (*Safety Code for Const. Industry*, Sec. 2.11)

SASKATCHEWAN

(1) Employer or contractor may permit only electrical workers to construct, install, alter, repair or maintain electrical equipment; (2) Employer or contractor may permit a competent worker who isn't an electrical worker: (a) to operate powered mobile equipment and perform non electrical work on or near de energized electrical equipment; (b) to extend a portable power cable for routine advancement by interconnection of approved cord connectors, cord caps or similar devices; (c) to change light bulbs or tubes; (d) to insert or replace an approved fuse, to a maximum of 750 volts, that controls circuits or equipment; or (e) to connect small portable electrical equipment that operates at less than 750 volts to supply circuits by Electrical equipment; (3) Employer or contractor must ensure that only approved electrical equipment is used by workers and that the electrical equipment is: (a) approved for the intended use and location of the electrical equipment; (b) maintained in proper working condition and capable of safe operation; and (c) tested in accordance with the manufacturer's recommendations; (4) If defects or unsafe conditions have been identified in electrical equipment, an employer or contractor: (a) must ensure that: (i) steps are taken immediately to protect the health and safety of any worker who may be at risk until the defects are repaired or the unsafe conditions are corrected; and (ii) the defects are repaired or the unsafe conditions are corrected as soon as reasonably practicable; or (b) must ensure that the electrical equipment is disconnected and removed from use; (5) Employer or contractor must ensure that: (a) all switches, receptacles, luminaires and junction boxes are fitted with a cover that approved for the intended use and location of the cover; (b) all wire joints or connections are: (i) fitted with an

approved cap or other approved cover; (ii) enclosed in an approved box; or (iii) if the wire joints or connections aren’t permanently installed, protected from damage by another approved means; and (c) all dead, abandoned or disused electrical conductors or equipment are removed from the place of employment or disconnected and secured to prevent inadvertent energization; (6) Special requirements for electrical equipment installed in a tunnel or manhole; (7) Employer or contractor must ensure that

a luminaire located at a height of less than 2.1 metres above a working or walking surface is protected against physical or mechanical damage by installation of a safeguard or the location of the luminaire; (8) Employer or contractor must ensure that an electrical extension or power supply cord used for supplying energy to any electrical equipment: (a) is approved for the intended use and location of the electrical extension or power supply cord; (b) is fitted with approved cord end attachment devices that are installed in an approved manner; (c) is provided with a grounding conductor; and (d) is maintained and protected from physical or mechanical damage; (9) Employer or contractor must ensure that every portable power cable and cable coupler is: (a) protected from physical or mechanical damage; and (b) inspected by a competent person at intervals sufficient to protect the health and safety of workers; (10) Employer or contractor must ensure that: (a) if any unsafe condition is identified in a portable power cable or cable coupler, the portable power cable or cable coupler is repaired or taken out of service; and (b) every splice in a portable power cable is sufficiently strong and adequately insulated to retain the mechanical and dielectric strength of the original cable; (11) A worker must take all reasonably practicable steps not to drive equipment over, or otherwise damage, a portable power cable or cable coupler; (12) If a portable luminaire is used, an employer or contractor must ensure that: (a) the electrical extension cord and fittings are approved for the intended use and location of the

extension cord and fittings and are properly maintained; and (b) the electrical extension cord isn’t used to supply power to any equipment other than the portable luminaire unless the cord meets the requirements of section 30-7; (13) Employer or contractor must ensure that a portable luminaire used in a damp location or in a metallic enclosure, including a drum, tank, vessel or boiler: (a) is operated at a potential of not more than 12 volts; or (b) is supplied by a circuit protected by a class A ground fault circuit interrupter; (14) Employer or contractor must ensure that every exposed metal part of portable electrical equipment that isn’t designed to carry electrical current is connected to ground unless: (a) the electrical equipment is of an approved, double insulated type and clearly marked as such; (b) power is supplied to the equipment through an isolating transformer having a non-grounded secondary of no more than 50 volts potential; (c) power is supplied to the equipment through a class A ground fault circuit interrupter; or (d) power is supplied to the equipment from a battery of not over 50 volts potential; (15) Employer or contractor or supplier must ensure that: (a) a portable electric power plant operated at voltages exceeding 240 volts to ground or is rated in excess of 12.0 kilovolt-amperes is connected to ground in a manner approved pursuant to *The Electrical Inspection Act, 1993*; and (b) all electrical equipment connected to an ungrounded portable electric power plant: (i) is of the double insulated type; and (ii) is clearly marked as being of the double insulated type or is supplied from a class A ground fault interrupting device; (16) Employer or contractor must ensure that every electrical panel is: (a) approved for the intended use and location of the electrical panel; (b) protected from physical or mechanical damage; (c) readily accessible; and (d) fitted with an approved cover that has an approved filler in any unused opening; (17) Employer or contractor must ensure that a place where electrical switchgear or transformers operating at high voltage are housed is: (a) guarded; (b) kept free of extraneous material; and (c) adequately ventilated; (18) If

high voltage switchgear or transformers are housed, employer or contractor must post a warning sign that: (a) indicates the highest voltage in use; and (b) states that access is restricted to authorized persons only; (19) Employer or contractor must ensure that a fire extinguisher approved for Class C fires is readily available to workers working on or near energized high voltage electrical equipment; (20) Before any work, other than work to which subsection 30-16(4) applies, begins on an electrical conductor or electrical equipment and during the progress of that work, an employer or contractor must ensure that: (a) the electrical conductor or electrical equipment is isolated, locked out and connected to ground; or (b) other effective procedures are taken to ensure the safety of the workers; (21) Employer or contractor must ensure that a qualified electrical worker has had approved training in high voltage safety; (22) No qualified electrical worker may undertake high voltage electrical work unless the worker: (a) has written proof of approved training in high voltage electrical safety; and (b) has that written proof of approved training readily accessible at all times while working near energized high voltage electrical conductors; (23) Employer or contractor must ensure that no worker works, no material is piled, stored or handled, no scaffold is erected or dismantled and no equipment or powered mobile equipment is used or operated within the minimum distance from any exposed energized electrical conductor set out in column 1 of Table 19 of the Appendix, except for a worker undertaking a specific one time activity under the direct supervision of a qualified electrical worker; (24) Employer or contractor must ensure that no worker who is at ground potential approaches an exposed energized electrical conductor closer than the minimum distance set out in column 2 of Table 19 of the Appendix; (25) Employer or contractor must ensure that only a qualified electrical worker works closer to an exposed energized electrical conductor than the minimum distance set out in column 2 of Table 19 of the Appendix; (26) If a qualified electrical worker works closer to an exposed energized

electrical conductor than the minimum distance set out in column 2 of Table 19 of the Appendix, employer or contractor must ensure that: (a) the qualified electrical worker: (i) performs the work in accordance with written instructions for a safe work procedure that have been developed and signed by a competent person who has been appointed by the employer or contractor for that purpose; (ii) uses equipment that is approved for the intended use of the equipment; and (iii) uses personal protective equipment that meets the requirements of Part 7; or (b) the conductor is operating at 25 kilovolts or less and is fitted with rubber and rubber like insulating barriers that meet the requirements of an approved standard; (27) Employer or contractor must ensure that no part of a vehicle is operated on a public road, highway, street, lane or alley within the minimum distance from an exposed energized electrical conductor set out in column 3 of Table 19 of the Appendix and that no part of a vehicle’s load comes within the minimum distance; (28) Employer or contractor must ensure that no utility tree trimmer works within the minimum distance from an exposed energized electrical conductor set out in: (a) column 4 of Table 19 of the Appendix for utility tree trimmers using conducting objects exposed to energized parts; (b) column 5 of Table 19 of the Appendix for utility tree trimmers using rated tools exposed to energized parts; (c) column 6 of Table 19 of the Appendix for utility tree trimmers using rated insulating booms;

Table 19

Risk Factor	Column 1	Column 2	Column 3	Column 4	Column 5	Column 6

Voltage Phase to Phase	Voltage to Ground	Non-electrical Workers, Material, Equipment	Qualified Electrical Workers	Vehicles and Loads	Limit of approach for utility tree trimmers using conducting objects exposed to energized parts	Limit of approach for utility tree trimmers using rated tools exposed to energized parts	Limit of approach for utility tree trimmers using rated insulating booms
kV	kV	Metres	Metres	Metres	Metres	Metres	Metres
230	133	6.1	1.4	1.83	2.4	1.41	1.85
138	79.8	4.6	1	1.22	1.9	0.92	1.35
72	41.6	4.6	0.6	0.8	1.6	0.61	1.05
25	14.4	3	0.3	0.6	1.2	0.12	0.55
15	8.6	3	0.3	0.6	1.1	0.12	0.55
4.16	2.4	3	0.15	0.6	1.05	0.04	0.50
0.75	0.75	3	0.15	0.6	1.05	0.04	0.05

29) Exposed energized electrical conductors operating at certain voltages 30 17 If work is being carried out in proximity to exposed energized electrical conductors operating at 31 to 750 volts, employer or contractor must ensure that the work is carried out so that accidental contact with the energized electrical conductor by any worker is prevented; (30) If an electrical worker may come in contact with an exposed energized electrical conductor and that contact may affect the health or safety of the worker, employer or contractor must develop and implement an emergency program that sets out the procedures to be followed in the event of that contact that includes procedures: (a) to rescue a worker who has come into contact with a live conductor; (b) to administer first aid to a worker who has sustained an electric shock; and (c) to obtain medical assistance; and (32) Employer or contractor must ensure that the workers are adequately trained to implement the emergency program (*OHS Regs*., Part 30)

NORTHWEST TERRITORIES & NUNAVUT

(1) Employer must not require or permit a worker to engage in electrical work unless they're a qualified electrical worker; (2) Employer may require or permit a competent worke;r (a) to operate powered mobile equipment and perform non-electrical work on or near de-energized electrical equipment; (b) to extend a portable power cable for routine advancement by interconnection of approved cord connectors, cord caps or similar devices; (c) to change light bulbs or tubes; (d) to insert or replace an approved fuse, to a maximum of 750 V, that controls circuits or equipment; or (e) to connect and use portable electrical equipment that operates at less than 750 V to supply circuits by means of attachment plug, without overloading the circuit conductors; (3) Employer must ensure that electrical equipment used by workers is (a) approved for its intended use and location; (b) maintained; and (c) tested in accordance with manufacturer's specifications; (4) If defects or unsafe conditions are identified in electrical equipment, employer must ensure that (a) steps are taken without delay to inform and protect the health and safety of workers who could be endangered; or (b) the defects are repaired or the conditions are corrected as soon as is reasonably possible; (5) Employer must ensure that: (a) switches, receptacles, luminaires and junction boxes are fitted with a covers that are approved for the intended use; (b) wire joints or connections are (i) fitted with an approved caps or other approved covers, (ii) enclosed in approved boxes, or (iii) if the wire joints or connections aren't permanently installed, protected from damage by another approved means; and (c) dead, abandoned or disused conductors or equipment are removed or disconnected and secured to prevent inadvertent energization; (6) Special requirements for electrical equipment in a tunnel or manhole; (7) Employer must ensure that a luminaire that is located at a height of less than 2.1 m above a working or walking surface, is protected against physical or mechanical damage; (8) Employer must

ensure that an electrical extension or power supply cord used for supplying energy to electrical equipment is (a) approved for the intended use and location; (b) fitted with an approved cord end attachment device that’s installed in an approved manner; (c) provided with a grounding conductor; and (d) maintained and protected from physical or mechanical damage; (9) Employer must ensure that portable power cables and cable couplers are (a) protected from physical or mechanical damage; and (b) inspected by a competent person at intervals that are sufficient to protect the health and safety of workers; (10) Employer must ensure that (a) if an unsafe condition is identified in a portable power cable or cable coupler, the cable or coupler is repaired or taken out of service; and (b) splices in a portable power cable are sufficiently strong and adequately insulated to retain the mechanical and dielectric strength of the original cable; (11) A worker must take reasonable steps not to drive equipment over, or otherwise damage, a portable power cable or cable coupler; (12) If a portable luminaire is used, employer must ensure that (a) the electrical extension cord and fittings are approved for the intended use and are properly maintained; and (b) the electrical extension cord isn’t used to supply power to equipment other than the portable luminaire, unless the cord meets the requirements of section 451; (13) Employer must ensure that a portable luminaire used in a damp location or in a metallic enclosure, including a drum, tank, vessel or boiler, (a) is operated at a potential of not more than 12 V; or (b) is supplied by a circuit that is protected by a Class A ground fault circuit interrupter; (14) Employer must ensure that exposed metal parts of portable electrical equipment that aren’t designed to carry electrical current are connected to ground unless (a) the equipment is of an approved, double-insulated type and is clearly marked as such; (b) power is supplied to the equipment through an isolating transformer having a non-grounded secondary of not more than 50 V potential; (c) power is supplied to the equipment through a Class A ground fault circuit interrupter; or (d) power is

supplied to the equipment from a battery of not over 50 V potential; (15) Employer or supplier must ensure that (a) a portable electric power plant that is operated at voltages exceeding 240 V to ground or is rated in excess of 12.0 kVA is connected to ground in a manner required by the *Electrical Protection Act* or its regulations; and (b) electrical equipment connected to an ungrounded portable electric power plant is (i) of the double insulated type, and (ii) clearly marked as being of the double insulated type or is supplied from a Class A ground fault interrupting device; (16) Employer must ensure that electrical panels are (a) approved for their intended use and location; (b) protected from physical or mechanical damage; (c) readily accessible; and (d) fitted with an approved cover that has an approved filler in an unused opening; (17) Employer must ensure that a place where electrical switchgear or transformers operating at high voltage are housed is (a) guarded; (b) kept free of extraneous material; and (c) adequately ventilated; (18) Employer must post a warning sign where high voltage switchgear or transformers are housed that (a) indicates the highest voltage in use; and (b) states that access is restricted to authorized persons only; (19) Employer must ensure that a fire extinguisher approved for Class C fires is readily available to workers working on or near energized high voltage electrical equipment; (20) Before work, other than work referred to in subsection 460(7), begins on a conductor or electrical equipment and during the progress of that work, employer must ensure that (a) the conductor or equipment is isolated, locked out and connected to ground; or (b) other effective procedures are taken to ensure the safety of workers; (21) Employer must ensure that a qualified electrical worker who will be exposed to energized high voltage conductors has received approved training in high voltage safety prior to exposure; (22) A qualified electrical worker must not undertake high voltage electrical work unless he or she has (a) written proof of having received approved training in high voltage safety; and (b) the written proof referred to

in paragraph (a) readily accessible while working near energized high voltage conductors; (23) Employer must ensure that workers don’t work, that material is not piled, stored or handled, that scaffolds aren’t erected or dismantled and that equipment or powered mobile equipment isn’t used or operated, within the minimum distance from an exposed energized conductor set out in column 1 of Schedule Y, except for a worker who undertakes a specific one-time activity under the direct supervision of a qualified electrical worker; (24) Employer must ensure that a worker at ground potential doesn’t approach an exposed energized conductor closer than the minimum distance set out in column 2 of Schedule Y; (25) Employer must ensure that a worker doesn’t work closer to an exposed energized conductor than the minimum distance set out in column 2 of Schedule Y, unless the worker is a qualified electrical worker; (26) If a qualified electrical worker works closer to an exposed energized conductor than the minimum distance set out in column 2 of Schedule Y, employer must ensure that (a) the qualified electrical worker (i) performs the work in accordance with written instructions for a safe work procedure that have been developed and signed by a competent person who has been appointed by the employer for that purpose, (ii) uses equipment that is approved for intended use, and (iii) uses personal protective equipment that meets the requirements of Part 7; or (b) the conductor is operating at 25 kV or less and is fitted with rubber and rubber-like insulating barriers that meet the requirements of an approved standard; (27) Employer must ensure that (a) no part of a vehicle is operated on a public road, highway, street, lane or alley within the minimum distance from an exposed energized conductor set out in column 3 of Schedule Y; and (b) no part of a vehicle’s load comes within the minimum distance referred to in paragraph (a); (28) Employer must ensure that utility tree trimmers don’t work within the minimum distance from an exposed energized conductor set out in (a) column 4 of Schedule Y, for utility tree trimmers using conducting objects exposed to energized parts; (b) column 5 of

Schedule Y, for utility tree trimmers using rated tools exposed to energized parts; and (c) column 6 of Schedule Y, for utility tree trimmers using rated insulating booms; (29) If work is carried out in proximity to exposed energized conductors operating at 31 to 750 V, employer must ensure that the work is carried out so that accidental contact with the energized conductor is prevented; (30) If an electrical worker could come in contact with an exposed energized conductor and that contact could endanger the worker, employer must develop and implement an emergency program that sets out the procedures to be followed in the event of that contact that includes procedures to (a) rescue a worker who has come into contact with a live conductor; (b) administer first aid to a worker who has sustained an electric shock; and (c) obtain medical assistance; and (31) Employer shall ensure that workers are adequately trained to implement an emergency program developed and implemented under this section (*OHS Regs*., Part 30)

YUKON

(1) Worker who installs, alters or maintains electrical equipment must be an electrical worker under the *Electrical Protection Act*; (2) Special rules for electrical work on poles and in tunnels and manholes; (3) Metal ladders or wire reinforced side rail wooden ladders must not be used while working around electrical equipment; (4) Passageways, service rooms, electrical vaults and working spaces around electrical equipment must be kept clear of obstructions, arranged to give authorized persons ready access to all parts requiring attention, and not used for storage; (5) Flammable material must not be stored or placed close to electrical equipment; (6) Electrical testing equipment used by workers must meet: (a) CSA C22.2 No. 160-M1985, Voltage and Polarity Testers, (b) CSA C22.2 No. 231 Series-M89, CSA Safety Requirements for Electrical and Electronic Measuring and Test Equipment, or (c) other similar standards acceptable to the board; (7)

Appropriate safe work procedures must be established by employer and followed by workers for testing electrical equipment and circuits; (8) For a switch and temporary panel board controlling a service entrance, service feeder or branch circuit: (a) a switch and temporary panel board must be securely mounted on a well-constructed vertical surface, be obstruction free and have a cover over the insulated current-carrying parts, (b) the switch and temporary panel board must be located in an area where water won't accumulate, and be within easy reach and readily accessible to workers, (c) the switch controlling a service centre, service feeder or branch circuit must not be locked in the closed position, and (d) the switch controlling a service centre, service feeder or the branch circuit must be housed in a lockable enclosure and be provided with a device for locking the enclosure; (9) Special rules for insulated aerial devices; (10) **Low voltage:** A worker must be informed of potential electrical hazards before being permitted to do work in proximity to energized electrical conductors or equipment; (11) Before a worker begins work on low-voltage electrical equipment, it must be completely disconnected and locked out; (12) Before completing installation and after energizing low-voltage electrical equipment, signs visible to workers must be placed close to the equipment stating "Danger, Energized Equipment"; (13) Uninsulated, energized parts of low-voltage electrical equipment must be guarded by approved cabinets or enclosures, unless the energized parts are in a suitable room or similar enclosed area that is only accessible to electrical workers authorized by the employer and each entrance to a room and other guarded location containing uninsulated and exposed energized parts must be marked with a warning sign limiting entry to electrical workers and persons authorized by the employer; (14) Where uninsulated, energized parts are not guarded with approved cabinets or enclosures (a) the workers must be informed of the potential hazards, provided with and follow appropriate written safe work procedures, or (b) suitable barriers or covers must be provided if a worker

unfamiliar with the hazards is working within 1 m (3.3 ft.) of the uninsulated parts; (15) Each electrical distribution switch, circuit breaker and control shall be clearly marked to indicate the equipment it serves; (16) Lockout and isolation required before work on **high-voltage** electrical equipment—alternatives provided for under Section 9.9; (17) Electrical equipment or power lines which not being used for the purposes for which they were originally designed must be isolated and de-energized, and either removed or, if left in place, shall be tagged and locked out or effectively grounded; (18) Before completing installation and after energizing high-voltage electrical equipment, signs visible to workers must be placed close to the equipment stating "Danger – Energized Equipment"; (19) Limits of approach apply; (20) Special rules for tree and pruning work; (21) Special rules for control systems; and (21) Special rules for electrofishing (*WSCA Regs.,* Part 9)