ESAFE-124

PSSP Cat4: PSSP Certified Utility Arborist

March 2026

Participant guide

BC Hydro
Power smart

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Course Introduction

Welcome to **Category 4: PSSP Certified Utility Arborist** training.

Approximate time required to complete this training is **1.5 hours**.

Audience

This training is for the following workers:

- Certified Utility Arborists (mandatory)
- Utility Arborist apprentices (mandatory)
- Others who work with Certified Utility Arborists (recommended)

Prerequisites

You must have successfully completed BC Hydro's PSSP Category 2 and 3 training and testing.

Course goal

The goal of this course is to educate participants in BC Hydro's Power System Safety Protection (PSSP) requirements for arborist work around its transmission and distribution lines.

Course objectives

By the end of this Category 4 training, you will be able to:

- Identify and maintain your Limits of Approach as specified in WorkSafeBC OHSR Table 19-3 for arborist type work.
- Describe arc flash hazards and define incident energy.
- Describe how applying Hot Line Tag (HLT) impacts arc flash incident energy.
- Describe when an Assurance of No Reclose Permit (ANRP) is required for your work and how to schedule, attain, and return this permit.
- Describe and work within the PSSP requirements for vegetation touching an energized high-voltage conductor or closer than Column A Limit of Approach for conductors energized to 60 kV and above.

Completion requirements

At the end of this course an examination will test your understanding of the information presented. Successfully passing this examination is only a part of the requirement for Category 4 authorization.

Utility Arborists PSSP authorization requirements

- Utility arborists must successfully complete Category 2, 3 & 4 system component training and examinations.
- Depending on whether your work will be in proximity to the distribution or transmission system you will be required to complete the appropriate functional component training.
- Prior to commencing work, workers must complete local information training for the location where the work will be performed.
- Utility arborists must be authorized in the PSSP Manager Database by an Authorizing BC Hydro Manager.

Lesson 1. Introduction to Category 4

What is Category 4 work?

BC Hydro classifies all pruning and tree removal adjacent to the power system by Certified Utility Arborists (CUAs) as Category 4 work.

BC Hydro's PSSP Category 4 Training and Authorization is required for all Certified Utility Arborists and recommended for Power Line Technicians (PLT) and the Person in Charge (PIC) when they work with Certified Utility Arborists and line technicians.

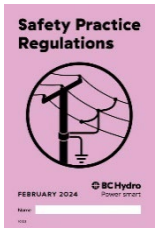
Regulations affecting Certified Utility Arborists

Certified Utility Arborists are primarily regulated by the WorkSafeBC regulations regarding arborist work around energized electrical conductors. However, when working for BC Hydro, **BC Hydro has additional regulations and practices to ensure worker safety**.

WorkSafeBC OHSR Part 19.30 to 19.35

Certified Utility Arborists working for BC Hydro are bound by WorkSafeBC OHSR Part 19.30 to 19.35 when the work involves pruning near energized conductors. They must be thoroughly familiar with and understand these regulations. Lesson 2 of this course deals with the Limits of Approach for Certified Utility Arborists as outlined in this regulation.

Safety Practice Regulations



The Safety Practice Regulations (SPR) define all the rules and instructions which govern all work done by or for BC Hydro on the power system. Power System Safety Protection (PSSP) is the system operating orders which define how these rules and instructions are consistently applied throughout the transmission and distribution system. Lessons 3 and 4 describe the application of PSSP as they pertain to Certified Utility Arborist work. Both the SPR and PSSP can be found by using the search tool on the BC Hydro website.

Power System Safety Protection

Power System Safety Protection is defined as the constraints required to be applied to the power system to provide worker protection from power system hazards during prescribed work.

Category 4 worker responsibilities

Category 4 workers are responsible for working within these two sets of regulations. With your authorization, you are able to:

- Apply for an Assurance of No Reclose Permit (ANRP) for the purpose of tree pruning.
- Work under a Power Line Technician's Clearance and/or Self Protection with direct supervision.
- Receive Protection Extensions on existing Clearances.

Lesson 2. Limits of Approach

Purpose

In this lesson Certified Utility Arborists will identify and maintain the Limits of Approach as specified in WorkSafeBC OHSR Table 19-3 for arborist-type work.

Topics

This lesson covers the following topics:

- Limits of Approach for Certified Utility Arborists
- Crossing the neutral
- Circuit identification at BC Hydro

Introduction

BC Hydro's first Life Saving Rule is "**Maintain your Limits of Approach**". Limits of Approach (LOA) is the closest distance an authorized worker is permitted to approach exposed energized conductors or equipment.

Limits of Approach are the safe distances you **must maintain** between your body/equipment and live electrical lines or apparatus. You are at risk in two different ways:

- Direct contact: Your body touches or comes within arcing distance to an energized conductor.
- Indirect contact: Your body touches something that is in direct contact or has come within arcing distance with an energized conductor such as a tool, a branch, or the ground.

Both types of contact can be fatal. Therefore, you, your tools, and any **vegetation you handle must not be closer to an energized conductor than the Limits of Approach.**

The rules governing LOA are the most important safety rules for anyone working around energized equipment. Since trees are good conductors of electricity and your work as an arborist keeps you near or touching them, obeying Limits of Approach is critical to your safety.

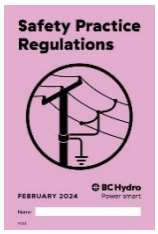


Table 401
Limits of Approach (LOA)

Nominal Voltage (kV)	Actual Voltage Range Phase to Phase	Qualified Electrical Worker		Uninsulated equipment or Unqualified Worker and their equipment when continuously directed by Qualified Electrical Worker		Unqualified Worker	
		m	ft	m	ft	m	ft
.751 to 35	751V to 40kV	0.75	2.5	1.20	4	3.00	10
60	40kV to 75kV	0.90	3	1.50	5	3.00	10
138	75kV to 150kV	1.50	5	2.40	8	4.50	15
230	150kV to 250kV	2.10	7	3.00	10	4.50	15
287	250kV to 325kV	2.60	8.5	3.70	12	6.00	20
345	325kV to 425kV	3.00	10	4.30	14	6.00	20
500	425kV to 550kV	3.70	12	4.90	16	6.00	20

WORKSAFE BC

Table 19-3: Limits of approach for utility arborists

Voltage range	A. Insulated tool limit for certified utility arborists		B. Work limit for certified utility arborists		C. Work limit for apprentice utility arborists	
Phase to phase	Metres	Feet	Metres	Feet	Metres	Feet
Over 750 V to 20 kV	0.3	1	0.9	3	3	10
Over 20 kV to 30 kV	0.5	1.5	1.2	4	3	10
Over 30 kV to 75 kV	0.9	3	1.5	5	3	10
Over 75 kV to 250 kV	2.1	7	3	10	4.5	15
Over 250 kV to 325 kV	2.6	8.5	4.5	15	6	20
Over 325 kV to 550 kV	3.7	12	6	20	6	20

Figure 1. LOA Regulations SPR 401 and WorkSafeBC Table 19-3

Depending on the type of work you are doing, there are two different sets of tables defining the allowable Limits of Approach when working around energized equipment.

Non-CUA work: SPR Table 401

Non-CUA work at BC Hydro is regulated by the SPR as emphasized in PSSP Category 2 and 3 training. SPR Table 401 outlines the Limits of Approach for these types of non-CUA work at BC Hydro.

CUA / CUA Apprentice work: WorkSafeBC Table 19-3

CUA work at BC Hydro is regulated by the WorkSafeBC Regulation Part 19.34 while tree pruning. These regulations take into consideration that trees are conductive and prone to move while being worked on. WorkSafeBC Table 19-3 outlines the Limits of Approach for Certified Utility Arborists, their apprentices, and tools.

Requirements for CUA Limits of Approach authorization

Certified Utility Arborists (CUA) may be authorized to CUA LOA and work up to the distances specified in WorkSafeBC Table 19-3, if **all** of the following are met:

1. Authorized to at least PSSP Category 4.
2. BC Provincial trade certification as a Certified Utility Arborist.
3. BC Hydro Manager authorization, as CUA LOA, restricted to WorkSafeBC 19-3 distances.

Certified Utility Arborist Apprentices shall be authorized as Unqualified LOA, but may work up to distances specified in WorkSafeBC Table 19-3 if they are working under the direct and continuous supervision of a Certified Utility Arborist authorized to CUA LOA.

Limits of approach for utility arborists

The applicable Limits of Approach table for Certified Utility Arborists and apprentices is located in the WorkSafeBC Regulation Part 19.34. The columns in the table define Limits of Approach according to a worker's qualifications, their level of supervision, and their equipment.

The table lists the **distances that shall be maintained between workers and conductive tools and exposed energized high-voltage conductors**. In other words, you are allowed to approach the conductor no closer than this limit.

WORK SAFE BC

Table 19-3: Limits of approach for utility arborists

Voltage range	A. Insulated tool limit for certified utility arborists		B. Work limit for certified utility arborists		C. Work limit for apprentice utility arborists	
Phase to phase	**Meters**	**Feet**	**Meters**	**Feet**	**Meters**	**Feet**
Over 750V - 20kV	0.3	1	0.9	3	3	10
Over 20kV - 30kV	0.5	1.5	1.2	4	3	10
Over 30kV - 75kV	0.9	3	1.5	5	3	10
Over 75kV - 250kV	2.1	7	3	10	4.5	15
Over 250kV - 325kV	2.6	8.5	4.5	15	6	20
Over 325kV - 550kV	3.7	12	6	20	6	20

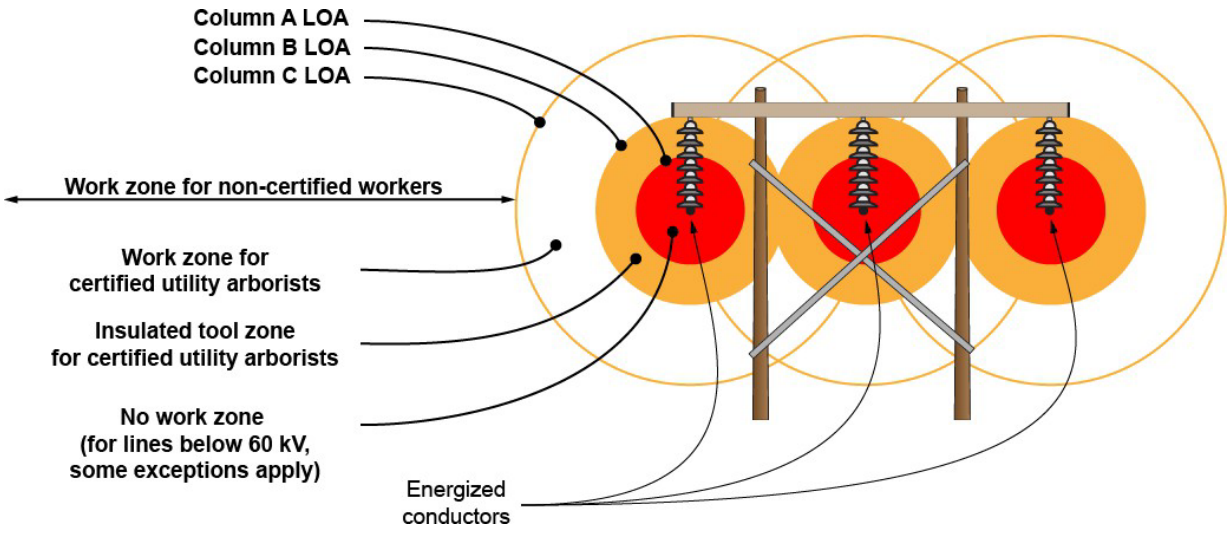


Figure 2. Work zones and Limits of Approach

Column C. Work limit for apprentice utility arborists, ground workers or slashers (all non-certified workers)

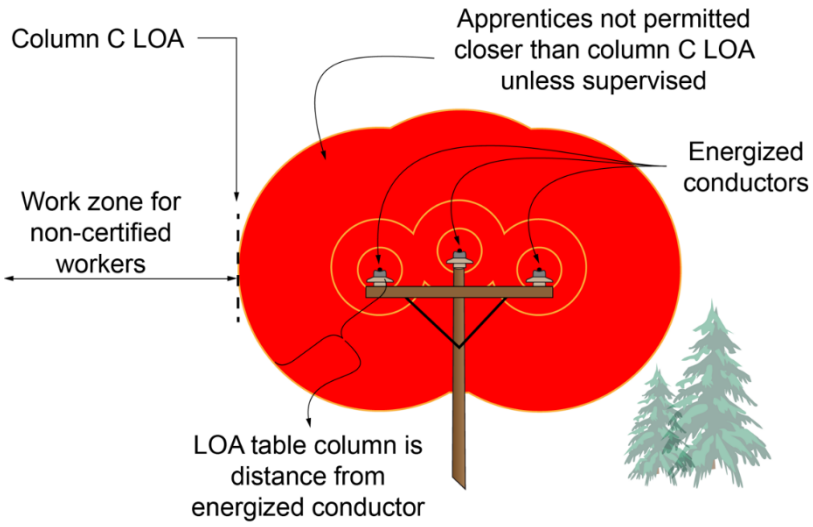


Figure 3. Column C LOA

Work up to Column C LOA applies to apprentice utility arborists (except under conditions noted below) and all other non-certified workers. Neither the worker, nor the tool being used, shall come closer than this limit to energized conductors **or to any vegetation if any part of that vegetation is closer than this limit or could swing closer while being cut**.

- During work up to Column C LOA an Assurance of No Reclose Permit (ANRP) is not required. ANRPs are described in lesson 3 of this course.

Exception

An apprentice utility arborist may work closer than Column C LOA but no closer than Column B LOA when in the presence of and under the direct supervision of a Certified Utility Arborist. (Reg. 19.34 (3))

Column B. Work limit for Certified Utility Arborists

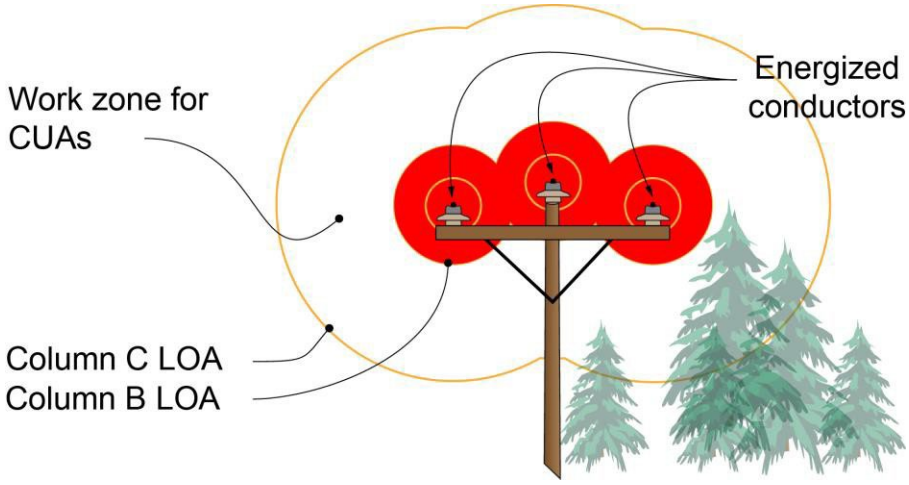


Figure 4. Column B LOA

Column B LOA applies to Certified Utility Arborists. Under no circumstance will the Certified Utility Arborist or any conductive tool being used come closer than this limit to energized conductors. This regulation applies to all work being carried out in the work zone (closer than Column C limit but no closer than Column B limit).

Restrictions

The following restrictions apply to Column B LOA.

- If conductive cutting tools such as chain saws are used, the same limits as listed in Column B shall also apply to the vegetation being cut.
- An ANRP must be in effect as this constitutes a hazardous location. (Reg. 19.30 and 19.31)

Column A. Insulated tool limit for Certified Utility Arborists

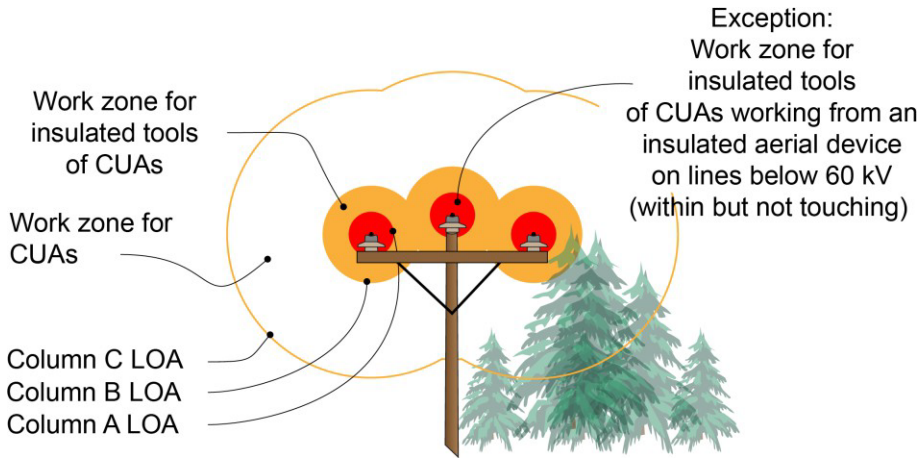


Figure 5. Column A LOA

Column A LOA a special limit of approach for a Certified Utility Arborist's **insulated tools**. (Regulation 19.34 (4)) This regulation applies to all work being carried out in the work zone for insulated tools (closer than Column B limit but no closer than Column A limit).

Important Note

The condition of insulated tools—including cleanliness and visible wear—can influence their dielectric properties and the level of electrical protection they provide. For example, trim saws that are not cleaned, waxed, and properly stored may have reduced insulating effectiveness. Refer to WorkSafeBC Regulation 19.35 for more details.

Restrictions

The following restrictions apply to Column A LOA:

- Using insulated tools, a Certified Utility Arborist can work on vegetation closer than Column B but not closer than Column A. (Reg.19.34 (5a))
- An ANRP must be in effect for this work. (Reg. 19.31)

Exceptions

There are two exceptions to this rule:

- **Using insulated tools from an insulated aerial device**, a Certified Utility Arborist can work on vegetation closer than Column A but not touching the energized conductor of less than 60 kV (see exception below). (Reg 19.34 (5b))
- BC Hydro applies Reg. 19.34 (6) to **60 kV** when working closer than Column A limits.

Restraining vegetation

There are several conditions when you must restrain the vegetation you are working on.

- If you cannot work from an aerial lift and vegetation is between Columns B and A, then the vegetation must be restrained before cutting. (Reg. 19.34 (7))
- If there is a possibility a tree (or any part of it) can come closer than Column A LOA after being cut, then the tree must be **topped first or secured** to prevent it breaching Column A. (Reg. 19.34 (8))

Vegetation touching an energized conductor

Certified Utility Arborists are NOT permitted to work on any vegetation touching an energized conductor or vegetation closer than Column A LOA when energized at 60 kV or greater (Reg. 19.34 (6)). If a piece of vegetation comes in contact with an energized conductor during work for any reason, work must stop immediately, the area cleared using step and touch precautions, and the control centre contacted immediately. A Category 5 Power Line Technician will be required to assess the situation.

Certified Utility Arborists can only continue to work on the vegetation after a Safety Protection Guarantee is in effect (line de-energized, isolated, grounds applied, etc.).

- This topic is covered in greater detail in lesson 4.

Crossing the neutral

WorkSafeBC Table 19-3 Limits of Approach must be maintained in all cases except when a Certified Utility Arborist is moving over a neutral conductor, at which time the WorkSafeBC Table 19-4 must be maintained.

Table 19-4 Crossing the neutral conductor

Column 1 voltage	Column 2: Minimum clearance distance from overhead conductor when crossing the neutral conductor	
Phase to phase	**Meters**	**Feet**
Over 750V - 20kV	0.60	2.0
Over 20kV - 30kV	0.75	2.5
Over 30kV - 75kV	0.90	3.0

The rules and conditions for crossing the neutral are outlined in WorkSafeBC Regulation 19.34.1. This regulation includes the requirements for the safety watcher that must be present on the ground to assist the Certified Utility Arborist in maintaining the clearance distances specified.

Circuit identification at BC Hydro

Circuit identification is important for the following reasons:

- Job locations are identified by a circuit name.
- The circuit name indicates the voltage of the line – critical for determining your working LOA.
- The circuit name is important when you call the PIC to apply for an ANRP (discussed in lesson 3) or if you need to identify your location in an emergency. Proper identification of circuits ensures the PIC can de-energize and make arrangements to isolate the line if required.

Typically, Certified Utility Arborists identify the lines they are working on using two methods:

- Operating diagrams
- VegNet mobile field component and/or web-based maps

Operating diagrams

Operating diagrams provide map views of BC Hydro distribution and transmission lines. By locating yourself on the map, you can identify the lines in your vicinity.

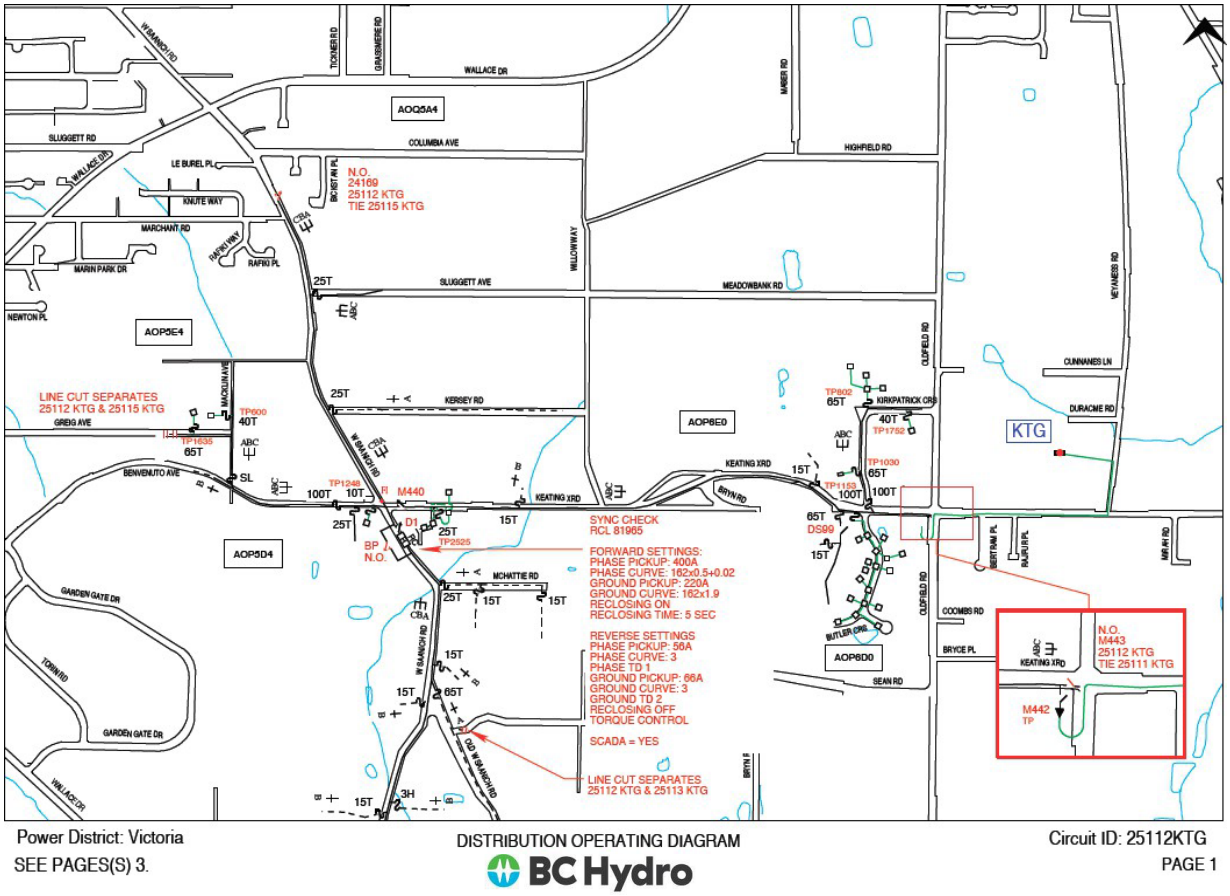


Figure 6. 25112KTG distribution operating diagram

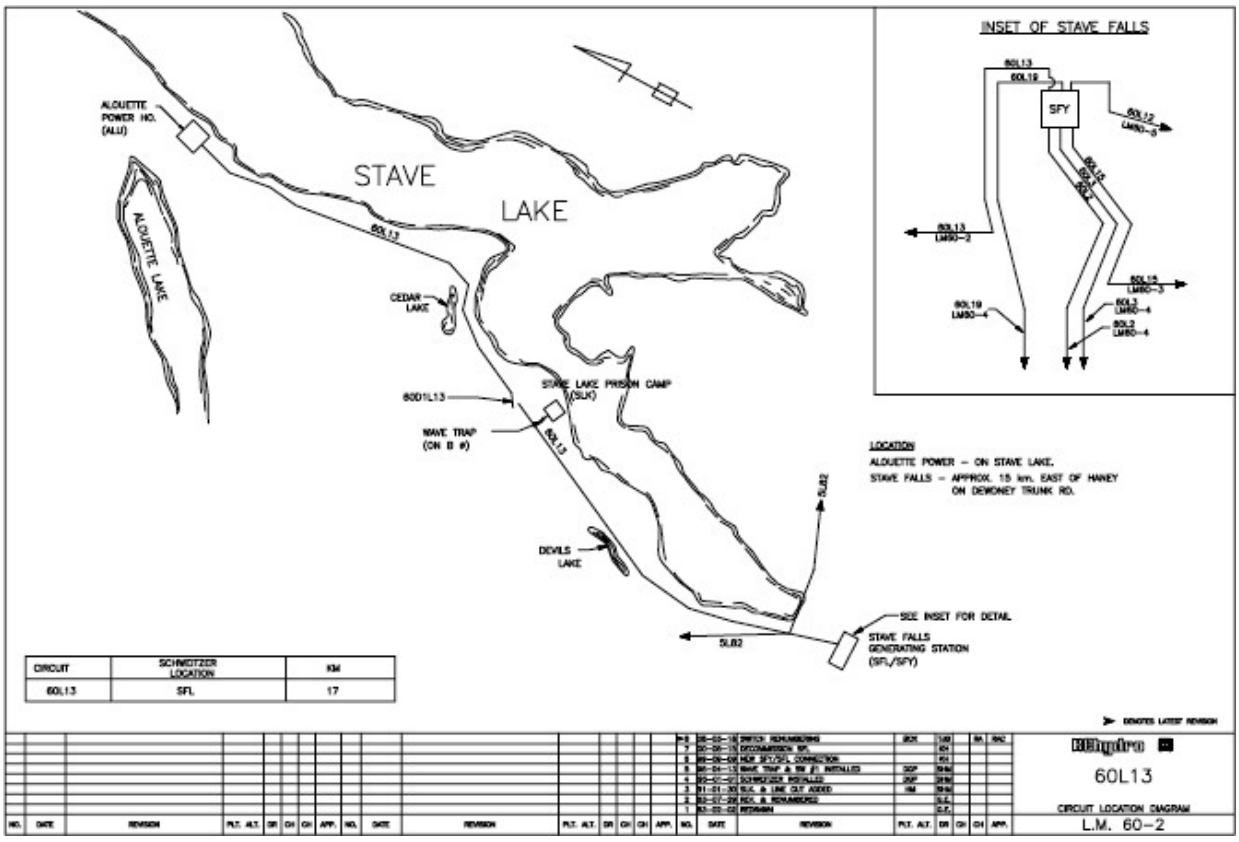


Figure 7. 60L13 circuit location diagram

VegNet

VegNet is a **GIS-based vegetation management application** used by **BC Hydro and its contractors** to collect, view, and update vegetation-related information associated with electrical assets. It provides a map-based view of the system and supports field data collection and office-based planning. Data captured in VegNet is integrated with BC Hydro's corporate GIS systems.

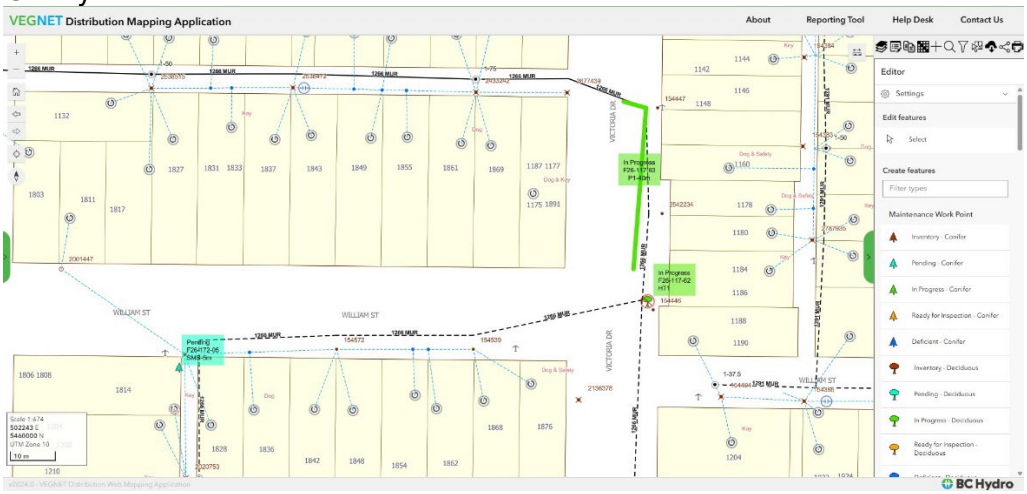


Figure 8a. VegNet Office View (zoomed in)

Figure 8a. VegNet Field Map

Circuit naming conventions

Distribution lines

Distribution lines are lines below 60 kV. Their circuit identification uses an alphanumeric code such as 25112KTG.

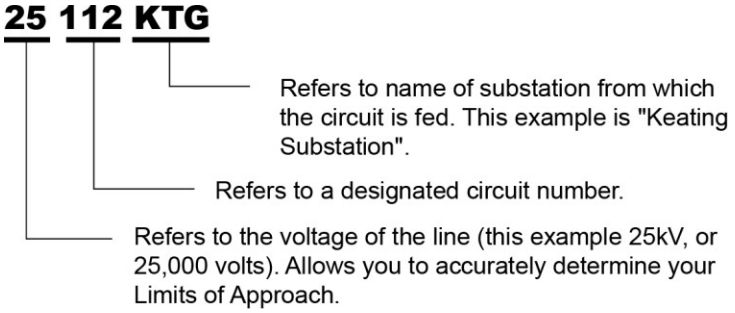


Figure 9. Distribution line circuit identification

Primary voltages used in BC Hydro distribution

There are three primary voltages used in BC Hydro distribution:

- 4 = 4 kV
- 12 = 12 kV
- 25 = 25 kV

Transmission lines

Transmission lines are lines 60 kV and above. They are named with a different alphanumeric code. Examples include 60L13, 1L48, 2L47, 5L32

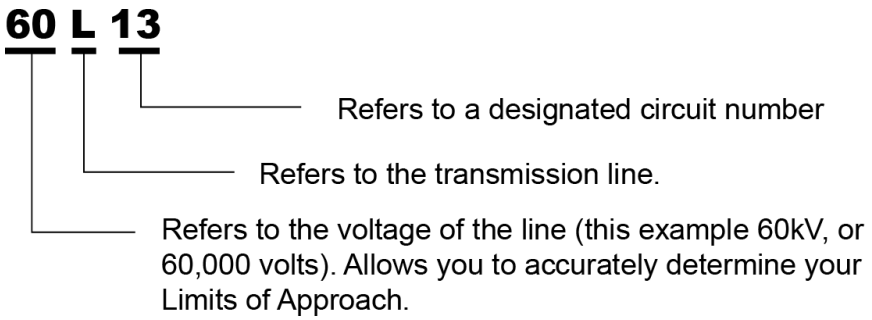


Figure 10. Transmission line circuit identification

Primary voltages used in BC Hydro Transmission

- 60 = 60 kV
- 1 = 138 kV
- 2 = 230 kV or 287 kV
- 3 = 360 kV
- 5 = 500 kV

Lesson 3. Arc Flash

Purpose

The purpose of this lesson is to introduce participants to the arc flash hazard and explain how a Hot Line Tag (HLT) can reduce but not eliminate the hazard.

Topics

This lesson covers the following topics:

- Describe arc flash
- Describe incident energy
- State what the minimum PPE requirement for BC Hydro protects against

Introduction

This section explains the essentials of working safely around energized equipment. You'll review BC Hydro's minimum FR clothing requirements, understand arc flash characteristics, learn about incident energy, and explore practical mitigation options such as de-energizing, Hot Line Tag, and maintaining safe working distances.

Arc Flash Information

Minimum PPE Requirements for BC Hydro

BC Hydro requires minimum personal protective equipment (PPE) to safeguard workers from electrical hazards, particularly those associated with arc flash events. PPE provides a critical layer of protection, but it is important to remember that distance is your friend—the farther you are from the source, the safer you will be. Physical separation significantly reduces exposure to thermal energy.

Arc Flash Characteristics

An arc flash is a sudden release of energy caused by an electrical fault through air. Unlike the high-voltage arcs you may have seen on the power system—typically low-current load arcs across an air gap—arc flashes in this context involve extremely high temperatures and intense radiant energy. These events can vaporize metal and cause severe burns, making them far more dangerous than the arcs you might be familiar with.

Incident Energy and its Hazards

Incident energy is the amount of heat that could reach a person near the arc. This hazard is different from electrical shock and must be addressed separately. While shock hazards involve current passing through the body, incident energy causes thermal burns and damage to exposed skin and clothing.

To put this into perspective:

- 1.2 cal/cm² is enough to cause a second-degree burn on bare skin.
- BC Hydro's minimum PPE is designed to protect against 8 cal/cm², but only for the areas of the body that the PPE covers. This means exposed areas remain vulnerable, reinforcing the importance of maintaining safe working distances and using proper protective gear.

Risk Assessment –Hazard Threshold / Mitigation

Mitigation: Control Barrier Options

When working around energized equipment, mitigation strategies are essential to reduce the risk of arc flash and other electrical hazards. The following control barriers are available:

1. De-energize, Isolate, and Ground

The most effective way to eliminate electrical hazards is to completely de-energize the work zone by isolating it from all sources of energy. For primary, a Safety Protection Guarantee must be received and grounding must be applied. For secondary, the Power Line Technician (PLT) will come to site and de-energize.

2. Hot Line Tag (HLT)

Hot Line Tag is a safety feature that helps electrical systems shut off faster to interrupt an arc. This quicker response reduces the amount of heat that an arc flash can release. Hot line tag reduces arc flash hazards, but does not eliminate them. Hot line tag does not protect against electric shock. The Load Operator will confirm whether HLT is enabled at the time the **ANRP (Assurance of No Reclose Permit)** is issued.

3. Distance

Work further away. The farther you are from the source, the less heat energy reaches you. For example, increasing your distance by 10 times reduces the heat energy by 100 times.

4. Use Safe Work Methods

Plan and employ work practices that minimize the probability of creating an arc. This includes maintaining proper distances, using insulated tools, and considering how vegetation could move.

Secondary Voltage Considerations

When working near secondary conductors, consider the following:

- Secondary conductors can have some of the highest incident energy on the system.
- ANRPs are not available for secondaries.
- Ensure you know the voltage of the secondary conductors you are working near. If you will be working near 347/600 V conductors, request an outage*.
- Assess the conditions of the secondary span. Some things to consider are:
  - Weather-stripping condition
  - Density of vegetation
  - Slackness in span

    - Condition of the spacers
- Follow your company procedure for arc flash hazards based on the incident energy.

* Note: You can get an outage on any voltage.

Lesson 4. Assurance of No Reclose Permit

Purpose

The purpose of this lesson is to describe when an Assurance of No Reclose Permits is required for your work and how to attain one.

Topics

This lesson covers the following topics:

- Definition of Assurance of No Reclose Permit (ANRP)
- Working with ANRPs
- Accidental contact
- Communications

Introduction

All transmission and distribution lines at BC Hydro are electrically protected in the event of a fault (example: tree limb makes contact with an energized line). In such an event, protection equipment is designed to open the line's circuit breaker to de-energize the line.

However, in most cases, the line's circuit breaker is also designed to automatically reclose within a few seconds to re-energize the line. Automatic reclosing is meant to protect the system from transient faults (trees which touch the line and continue on to fall to ground).

- The circuit breaker's automatic reclose feature can be disabled when necessary.
    - The PIC can disable the reclose function of a station circuit breaker or field recloser through an online command from the control centre.
    - For some station circuit breakers and field reclosers that do not have remote supervisory control, a Power Line Technician or electrician has to be dispatched to manually disable the reclosing function at the circuit breaker or at the field recloser.

Automatic reclose must be disabled on any line where tree work is being performed for the following reasons:

- Work is in proximity to energized conductors
- Vegetation being worked on may come within Column C LOA

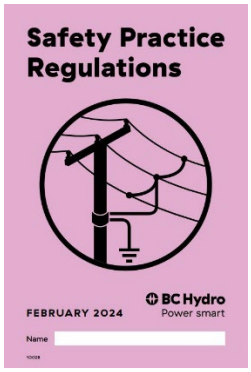
Hazardous Area Definition

Whenever tree work is to be done in proximity to energized conductors and the potential is present for vegetation to be or move closer than Column C Limits of Approach (Table 19-3: Limits of approach for utility arborists), this is deemed a **hazardous area and an ANRP must be in effect**.

WorkSafeBC Reg. Section 19.31

Tree pruning or falling must not commence in a hazardous area until an assurance is issued by the owner of the power system that any reclose feature is disabled.

Definition of Assurance of No Reclose Permit (ANRP)



SPR 425 Assurance of No Reclose Permit

An Assurance of No Reclose Permit provides no personal protection in case of direct contact with an energized conductor or equipment by a worker. The worker's protection depends on proper work practices and use of approved, tested, and well-maintained tools.

1. An Assurance of No Reclose Permit is issued by the PIC to qualified electrical or nonelectrical workers for work near energized conductors or equipment when it is required that reclosing not occur if automatic tripping takes place.
2. Before issuing an Assurance of No Reclose Permit, the PIC shall make arrangements to prevent immediate re-energizing of the circuit or equipment (including any required Guarantees of No Reclose from other operating authorities), and shall retain Operating Authority over all reclosing devices (refer to Rule 614.7 for reclose off and tagging requirements).
3. The PIC shall have a means of direct communication with the permit holder.
4. In case of de-energization, the PIC shall contact the permit holder before the circuit or equipment is re-energized, unless the circuit or equipment has been de-energized by other than its own protection or the cause is verified by a qualified person.

Working with ANRPs

Scheduling an ANRP

Scheduling your work is important for safety and efficiency. Only the PIC holds Operating Authority and Responsibility and knows the real time status of the power system. This allows him/her to evaluate your work location and identify the correct reclosing to block prior to issuing the ANRP. There are hundreds of requests that come to the control centre daily each one requiring research and preparation. This drives the scheduling timelines which allow each request to be fully evaluated and prepared during the off shifts.

Requests for an ANRP should be pre-scheduled with the BC Hydro Control Centre as follows:

- For transmission circuits: Submitted by 11:00 hour of the working day prior to the planned start date.
  - Submitted in CROW usually by the Vegetation Coordinator
  - System Operating Order 1T-22
- For distribution circuits: No later than 20:00 hours of the previous working day of the permit date.
  - Submitted by FAX or Email by the contractor, see example below
  - Distribution Operating Order 1D-15
- Emergency Work Requests (tree online, wires down, etc.) will be accepted 24/7 by the BC Hydro Control Centre.

BC Hydro
Power smart

DOO 1D-15

Fraser Valley Office – VI/LM Load Operations
Email to: *mailto:permit.requests@bchydro.com*
Fax to: 604-455-1809
ALL REQUESTS TO BE SUBMITTED BY 19:00 HOURS OF PREVIOUS WORKING DAY

Company Data
NAME Davey Tree Services
Phone Number (24 hours) 604-123-4567
FAX Number 604-765-4321

DISTRIBUTION DAILY ASSURANCE OF NO RECLOSE PERMIT FORM

BCH Charge No. 00123 **Work Type** tree trimming **Work Management Area** Victoria
Date required: 2016, 03, 15 (Year, Month, Day) **Company or BCH Area:** West Sannich

Worker's Name	Method of Comm. & Number	Station / Circuit	Location	VI only DOD Page x/y
John Doe	cel. 250-987-6543	25112 KTG	W Sannich rd between 81965 & 24169	pg 1

Figure 11. 1D-15 ANRP Request form

Requesting an ANRP

When requesting an ANRP, be prepared with the following information:

- Your full name
- Your company name
- Method of Communication & Number (ex. cellular or radio)
- The location of the work
- The circuit you want covered under the ANRP
- Expected duration of the work

Communicating an ANRP request with BC Hydro Control Centre

When communicating an ANRP request (as with any operating communications), always use clear and precise terms and acknowledge the communication by using repeat back procedure. When communicating with the Control Centre operator:

- Identify yourself and your company.
- Indicate the reason for your communication (i.e. requesting an ANRP).
- Identify the location of work and the circuit name.
- Acknowledge any communication by repeating back what was received.
- Record the PIC's name and time of permit on a documented tailboard record.

Returning an ANRP

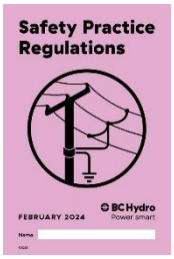
Once the work is completed, always return an ANRP so the line can be restored to normal operation (leaving a permit in effect longer than necessary puts the power system at risk).

- Before returning an ANRP, verify the crew is clear of the line and has been warned to stay clear of the line.
- When returning an ANRP, follow the same communication protocol (identify yourself, reason for call, location, etc.).

Accidental contact

Warning

In all cases where there is an accidental contact with energized high-voltage overhead conductors by vegetation growth or by equipment being used to perform tree pruning, all workers must be warned to stay in the clear and the PIC must be contacted immediately and informed of the circumstances. No further tree pruning may be performed until the PIC gives permission to proceed.



SPR 504 Equipment to be Treated as Energized

All high-voltage conductors and electrical or mechanical equipment that may be operated or energized by conventional means or by backfeed shall be treated as energized unless a Clearance, Test and Work Permit, Self Protection, or Lockout is in effect and Worker Protection Grounding/Bonding or blocking has been applied on such conductors or equipment.

Communications

The permit holder of an ANRP must be available at all times for communication with the BC Hydro Control Centre at the number provided at the time of request. This availability permits instant communication in the event of a trip or an incident. Either party must be able to contact the other for operational or emergency response.

- If a cellular number was provided at the time of request but cellular coverage is not available at your work location, you must be available either through the BC Hydro radio service or through a reliable third-party through whom information can be relayed. When using a radio, ensure it is loud enough to be heard at all times while you are working, or have it continuously monitored by someone else. The contact information for the method chosen must be given to the Control Centre at the time the ANRP is issued.

  Note: For refresher training on radio use, you can access the contractor library for course SAFE 115 (Mobile Radio – VHF System) and/or SAFE 541 (Mobile Radio – Tetra system) as applicable.
- The PSSP Local Information contains BC Hydro contact numbers to contact the Control Centre.

In case of emergency

When contacting the PIC if there is an emergency that has to be reported, make sure that you **identify the circuit and the location involved**. This information will assist the Control Centre in de-energizing the circuit, if necessary, and dispatching assistance to isolate and ground the line if necessary or provide other emergency assistance.

BC Hydro recommends that you carry details of circuit locations and emergency phone numbers for your work site on your person at all times.

Lesson 5. Application of Safety Protection for Certified Utility Arborists

Purpose

The purpose of this lesson is to describe and work within the PSSP requirements for vegetation that is in contact with energized distribution lines or closer than Column A Limits of Approach on circuits 60 kV and greater.

Topics

This lesson covers the following topics:

- Safety Protection Guarantees required for Certified Utility Arborist work
- Working under a Category 5 worker's Clearance or Self Protection
- Working under a Protection Extension
- Grounding and Blocking

Introduction

Vegetation in contact with conductors

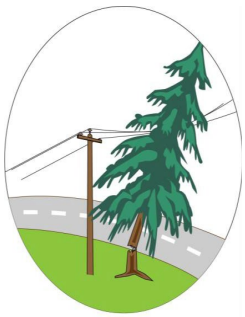
This lesson reviews the requirements for approaching or working on vegetation that is in contact with a conductor and when vegetation is closer than Column A Limits of Approach for conductors energized at 60 kV and above.

Important

Both the BC Hydro Safety Practices Regulations and WorkSafeBC Regulation are very clear: workers must always maintain Limits of Approach when working around energized conductors. Certified Utility Arborists, as Category 4 workers, are NOT permitted to work on vegetation that is in contact with energized conductors or closer than Column A limits for lines 60 kV and over.

Category 5 worker responsibilities

When vegetation makes contact with a conductor, typically the feeder protection will "trip the circuit" de-energizing it to maximize public safety and minimize equipment and property



damage. This happens most often during storms but it can also happen in the event of accidental contact.

BC Hydro's first response is to have a Category 5 Power Line Technician (PLT) patrol the circuit to access the situation and determine the best course of action.

- They can choose to remove the vegetation themselves using live-line methods that they have been specially training in.
- They can arrange to have a Certified Utility Arborist remove the vegetation after the line has been safely isolated and grounded according to PSSP requirements. This work requires establishing a **Safety Protection Guarantee** as outlined in Category 3 training.

This lesson looks at this second option.

Safety Protection Guarantees required for Certified Utility Arborist work

As a Certified Utility Arborist, you are permitted to clear vegetation that is in contact with a conductor or when it is closer than Column A LOA for 60 kV or greater when one of the following types of Safety Protection Guarantee (SPG) is in place.

- You can work under the direct supervision of a Power Line Technician who is in possession of a **Clearance**.
- You can work under the direct supervision of a Power Line Technician who has taken **Self Protection** on a **Distribution** circuit.
  - Self Protection is not permitted on lines 60 kV and above.
- You can work under the indirect supervision of a Power Line Technician through a **Protection Extension** for yourself and your crew.

Ask the Power Line Technician what additional protection has been provided for you (called either additional separation or enhanced isolation) and record this on your tailboard.

Working under a Category 5 worker's Clearance

A Power Line Technician will establish a Clearance for work when a line has multiple isolation points or when there will be multiple crews working along a lateral line and protection extensions are required.

Your responsibility as a Certified Utility Arborist working under the Category 5 worker's Clearance is as follows:

- Actively participate in the tailboard. Verify clearance provides

proper isolation.

- Before beginning work on the line, verify that worker protection grounding/bonding is in place.

Working under a Category 5 worker's Self Protection

A Category 5 Power Line Technician can decide to isolate a line under a Self Protection when it is a lateral distribution line below 60 kV AND when he/she will remain on site and all crews can be directly supervised and protected with one set of equal potential bonding.

Your responsibility as a Certified Utility Arborist working under the Category 5 worker's Self Protection is as follows:

- Actively participate in the tailboard. Verify the Self Protection provides proper isolation.
- Before beginning work on the line, verify that worker protection grounding/bonding is in place.

Working under a Protection Extension

The Clearance Holder may choose to issue a Protection Extension to a Certified Utility Arborist when the Clearance Holder will be absent from the work zone or they have multiple crews working **between the same points of isolation**.

Your responsibility as a Certified Utility Arborist working under the Category 5 worker's Protection Extension is as follows:

- Actively participate in the tailboard. Verify Protection Extension provides proper isolation.
- Before beginning work on the line, verify worker protection grounding/bonding is in place.
- Personally apply Grounding/Blocking Protection tag(s) under the direction of the Safety Protection Guarantee (SPG) holder; do not rely on others to apply them for you.

Protection Extension holder responsibilities

If you are the Protection Extension holder, you are also additionally responsible for the following:

- You must ensure your crew is safe.
- You must remain on the job site at all times.

Returning a Protection Extension

- When you and your crew are finished working, you must:
  - Inform all crew members the protection is being cancelled and that **Limits of Approach now apply**.

- Clear the work zone of all workers and equipment AND then inform the Clearance Holder that you wish to **return your Protection Extension** and that the site is clear.
- Remove personalized “Grounding/Blocking Protection” tag(s).
- Return the Protection Extension to the Clearance Holder.

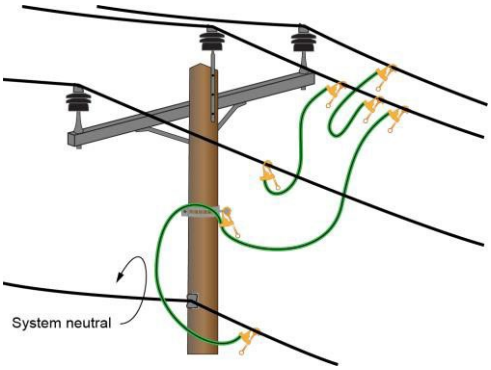
Worker Protection Grounding/Bonding

Ensure that Worker Protection Grounding/Bonding is applied.

While isolation protects you from being energized by BC Hydro’s power system, grounding protects you from indirect energizing from other sources.

For example, proper grounding is a system that protects you from:

- Back feeds
- Lightning
- Induction
- Accidental energization



Location of grounds

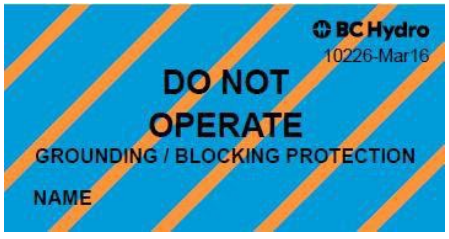
Worker protection grounding/bonding shall be used to establish an equal potential zone at the work area. If possible, they should be visible from the work location.

Remember

Worker Controlled Grounds are key to your safety and must remain in your control at all times.

Tagging

The Certified Utility Arborist holder of the Protection Extension must tag the worker protection grounding with a personalized "Grounding /Blocking Protection" tag **under the direct personal supervision of the Category 5 worker** (i.e. Power Line Technician) who holds the SPG.



- Tagging may be omitted only if the Category 5 worker maintains constant observation of the personal protective grounding throughout the job.
- Removing personalized “grounding/blocking protection” tag(s) must be directed by the Cat 5 Clearance Holder but the Cat 5 worker does not have to be present for tag(s) removal.

Scenarios

Scenario 1

You are a Certified Utility Arborist. You arrive on the job at 6 am after an evening of high winds and rain. There are fallen trees and branches, some very close to the power lines. You see that many of the trees are touching each other and several are touching the power line.

Describe your assessment of this work referencing LOA tables and PSSP requirements.

Scenario 2

You are slashing a 500 kV right of way. All of the material to be slashed is at least 7 m below conductor height.

Describe your assessment of this work referencing LOA tables and PSSP requirements.

Scenario 3

You are required to climb and side prune a big leaf maple adjacent to a 25 kV line. Most of the limbs are more than 3 m from the conductor, but a few are 2 m from the conductor.

Describe your assessment of this work referencing LOA tables and PSSP requirements.

Scenario 4

You are required to clear a span of slash from a three phase 25 kV line. The tops of several small trees are flat due to previous contact with the conductors, but now there is a 20 cm air gap between the tops and the conductors. The entire span is accessible by bucket truck.

Describe your assessment of this work referencing LOA tables and PSSP requirements.

Scenario 5

You are side pruning a row of Douglas-fir from an insulated aerial device, adjacent to a 25 kV line. The tips of some limbs are about 15 cm from the conductor.

Describe your assessment of this work referencing LOA tables and PSSP requirements.

Scenario 6

You are in an insulated aerial device using an insulated trim saw to clear brush that has grown very close to the conductors. You come to a cottonwood stem that has grown up between the phases of the 25 kV circuit, and the top is about 2 m above the conductor level. When you assess the situation you determine that you cannot prevent the possibility of contact when you remove the top.

Describe your assessment of this work referencing LOA tables and PSSP requirements.

Scenario 7

You are in an insulated aerial device using an insulated trim saw to side prune limbs that have grown very close to the conductors. You observe that the breeze is actually bringing some of the limbs to be pruned into contact with the conductor.

Describe your assessment of this work referencing LOA tables and PSSP requirements.

Scenario 8

You are preparing to side prune a cottonwood on a 60 kV line from an insulated aerial device. You observe that one of the limbs is within 0.7m of the conductor.

Describe your assessment of this work referencing LOA tables and PSSP requirements.

Scenario 9

You are in an insulated aerial device using an insulated trim saw to prune limbs that have grown over and close to the primary conductors. In this scenario the tree branch is spanning across all three phases and is within a few feet of the conductors.

Describe your assessment of this work referencing LOA tables and PSSP requirements.

Scenario 10

You are in an insulated aerial device preparing to trim branches at the secondary conductor level. When you position the bucket, you notice branches and brush are heavily grown into the secondary conductors. What needs to be considered regarding arc flash?