

## Great Western Painting

### Line-Clearance, Tree-Trimming

#### **LINE-CLEARANCE, TREE-TRIMMING**

##### **Telecommunications – 1910.268**

##### **Electric Power Generation, Transmission, and Distribution – 1910.269**

All the provisions of 29 CFR 1910.269 except paragraph (r)(1) apply to line-clearance tree-trimming operations performed by **qualified employees** (those who are knowledgeable in the construction and operation of electric power generation, transmission, or distribution equipment involved, along with the associated hazards).

The provisions of 29 CFR 1910.269, paragraphs (a)(2), (b), (c), (g), (k), (p), and (r) apply to line-clearance tree-trimming operations performed by line-clearance tree trimmers who are **not qualified employees**.

All employees involved in line-clearance tree trimming will be trained and competent in:

1. the skills and techniques necessary to distinguish exposed live parts from other parts of electric equipment,
2. the skills and techniques necessary to determine the voltage of exposed live parts,
3. the minimum approach distances that correspond to the voltages to which the employee will be exposed, and
4. the proper use of personal protective equipment, insulation and shielding materials and insulated tools.

A safety briefing shall be conducted by the employee in charge with the employees involved before the start of the first job of each day or shift. The briefing shall cover at least the following subjects: hazards associated with the job, work procedures involved, special precautions, energy source controls, and personal protective equipment requirements.

Employees engaged in pruning, trimming, removing, or clearing trees from lines shall be required to consider all overhead and underground electrical power conductors to be energized with potentially fatal voltages, never to be touched (contacted) either directly or indirectly.

Employees engaged in line-clearing operations shall be instructed that:

1. A direct contact is made when any part of the body touches or contacts an energized conductor, or other energized electrical fixture or apparatus.
2. An indirect contact is made when any part of the body touches any object in contact with an energized electrical conductor, or other energized fixture or apparatus.

3. An indirect contact can be made through conductive tools, tree branches, trucks, equipment, or other objects, or as a result of communications wires, cables, fences, or guy wires being accidentally energized.
4. Electric shock will occur when an employee, by either direct or indirect contact with an energized conductor, energized tree limb, tool, equipment, or other object, provides a path for the flow of electricity to a grounded object or to the ground itself. Simultaneous contact with two energized conductors will also cause electric shock which may result in serious or fatal injury.
5. Before any work is performed in proximity to energized conductors, the system operator/owner of the energized conductors shall be contacted to ascertain if he knows of any hazards associated with the conductors which may not be readily apparent. This rule does not apply when operations are performed by or on behalf of, the system operator/owner.

**Note: The below does not apply to Qualified Employees.**

**Note: Tables R-6, R-9 and R-10 are found on the last page of this document**

Before an employee climbs, enters, or works around any tree, a determination shall be made of the nominal voltage of electric power lines posing a hazard to employees. However, a determination of the maximum nominal voltage to which an employee will be exposed may be made instead, if all lines are considered as energized at this maximum voltage.

There shall be a second line-clearance tree trimmer within normal (that is, unassisted) voice communication under any of the following conditions:

1. If a line-clearance tree trimmer is to approach more closely than 10 feet (305 cm) any conductor or electric apparatus energized at more than 750 volts or
2. If branches or limbs being removed are closer to lines energized at more than 750 volts than the distances listed in Table R-6, Table R-9, and Table R-10 or
3. If roping is necessary to remove branches or limbs from such conductors or apparatus.

Line-clearance tree trimmers shall maintain the minimum approach distances from energized conductors given in Table R-6, Table R-9, and Table R-10.

Branches that are contacting exposed energized conductors or equipment or that are within the distances specified in Table R-6, Table R-9, and Table R-10 may be removed only through the use of insulating equipment.

**Note:** A tool constructed of a material that has insulating qualities meeting paragraph (j)(1) of this section is considered as insulated if the tool is clean and dry.

**Note:** 1910.269(j)(1): "Design of tools." Live-line tool rods, tubes, and poles shall be designed and constructed to withstand the following minimum tests:

1. 100,000 volts per foot (3281 volts per centimeter) of length for 5 minutes if the tool is made of fiberglass-reinforced plastic (FRP), or
2. 75,000 volts per foot (2461 volts per centimeter) of length for 3 minutes if the tool is made of wood, or
3. Other tests that the employer can demonstrate are equivalent.

**Note:** Live-line tools using rod and tube that meet ASTM F711-89, Standard Specification for Fiberglass-Reinforced Plastic (FRP) Rod and Tube Used in Live-Line Tools, conform to paragraph (j)(1)(i) of 1910.269

Ladders, platforms, and aerial devices may not be brought closer to an energized part than the distances listed in Table R-6, Table R-9, and Table R-10.

Line-clearance tree-trimming work may not be performed when adverse weather conditions make the work hazardous in spite of the work practices required by this section. Each employee performing line-clearance tree trimming work in the aftermath of a storm or under similar emergency conditions shall be trained in the special hazards related to this type of work.

**Note:** Thunderstorms in the immediate vicinity, high winds, snow storms, and ice storms are examples of adverse weather conditions that are presumed to make line-clearance tree trimming work too hazardous to perform safely.

### **"Brush chippers."**

1. Brush chippers shall be equipped with a locking device in the ignition system.
2. Access panels for maintenance and adjustment of the chipper blades and associated drive train shall be in place and secure during operation of the equipment.
3. Brush chippers not equipped with a mechanical infeed system shall be equipped with an infeed hopper of length sufficient to prevent employees from contacting the blades or knives of the machine during operation.
4. Trailer chippers detached from trucks shall be chocked or otherwise secured.
5. Each employee in the immediate area of an operating chipper feed table shall wear appropriate personal protective equipment.

## **Gasoline-engine Power Saws Use:**

1. Each power saw weighing more than 15 pounds (6.8 kilograms, service weight) that is used in trees shall be supported by a separate line, except when work is performed from an aerial lift and except during topping or removing operations where no supporting limb will be available.
2. Each power saw shall be equipped with a control that will return the saw to idling speed when released.
3. Each power saw shall be equipped with a clutch and shall be so adjusted that the clutch will not engage the chain drive at idling speed.
4. A power saw shall be started on the ground or where it is otherwise firmly supported. Drop starting of saws over 15 pounds (6.8 kg) is permitted outside of the bucket of an aerial lift only if the area below the lift is clear of personnel.
5. A power saw engine may be started and operated only when all employees other than the operator are clear of the saw.
6. A power saw may not be running when the saw is being carried up into a tree by an employee.
7. Power saw engines shall be stopped for all cleaning, refueling, adjustments, and repairs to the saw or motor, except as the manufacturer's servicing procedures require otherwise.

## **Rope:**

1. Climbing ropes shall be used by employees working aloft in trees. These ropes shall have a minimum diameter of 0.5 inch (1.2 cm) with a minimum breaking strength of 2300 pounds (10.2 kN). Synthetic rope shall have elasticity of not more than 7 percent.
2. Rope shall be inspected before each use and, if unsafe (for example, because of damage or defect), may not be used.
3. Rope shall be stored away from cutting edges and sharp tools. Rope contact with corrosive chemicals, gas, and oil shall be avoided.
4. When stored, rope shall be coiled and piled, or shall be suspended, so that air can circulate through the coils.
5. Rope ends shall be secured to prevent their unraveling.
6. Climbing rope may not be spliced to effect repair.
7. A rope that is wet, that is contaminated to the extent that its insulating capacity is impaired, or that is otherwise not considered to be insulated for the voltage involved may not be used near exposed energized lines.

Table R-6. - AC Live-Line Work Minimum Approach Distance

Nominal voltage in kilovolts phase to phase	Distance			
	Phase to ground exposure		Phase to phase exposure	
	(ft-in)	(m)	(ft-in)	(m)
0.05 to 1.0	(4)	(4)	(4)	(4)
1.1 to 15.0	2-1	0.64	2-2	0.66
15.1 to 36.0	2-4	0.72	2-7	0.77
36.1 to 46.0	2-7	0.77	2-10	0.85
46.1 to 72.5	3-0	0.90	3-6	1.05
72.6 to 121	3-2	0.95	4-3	1.29
138 to 145	3-7	1.09	4-11	1.50
161 to 169	4-0	1.22	5-8	1.71
230 to 242	5-3	1.59	7-6	2.27
345 to 362	8-6	2.59	12-6	3.80
500 to 550	11-3	3.42	18-1	5.50
765 to 800	14-11	4.53	26-0	7.91

Note 1: These distances take into consideration the highest switching surge an employee will be exposed to on any system with air as the insulating medium and the maximum voltages shown.

Note 2: The clear live-line tool distance shall equal or exceed the values for the indicated voltage ranges.

Note 3: See Appendix B to this section for information on how the minimum approach distances listed in the tables were derived.

<sup>4</sup> Avoid contact.

Table R-9. - DC Live-Line Work Minimum Approach Distance  
With Overvoltage Factor

Maximum anticipated per-unit transient overvoltage	Distance in feet-inches				
	Maximum line-to-ground voltage in kilovolts				
	250	400	500	600	750
1.5 or lower.....	3-8	5-3	6-9	8-7	11-10
1.6.....	3-10	5-7	7-4	9-5	13-1
1.7.....	4-1	6-0	7-11	10-3	14-4
1.8.....	4-3	6-5	8-7	11-2	15-9

Note 1: The distances specified in this table may be applied only where the maximum anticipated per-unit transient overvoltage has been determined by engineering analysis and has been supplied by the employer. However, if the transient overvoltage factor is not known, a factor of 1.8 shall be assumed.

Note 2: The distances specified in this table are the air, bare-hand, and live-line tool distances.

Table R-10. - Altitude Correction Factor

Altitude				Correction factor	
ft	ft	m	m		
3000	10000	900	3000	1.00	1.20
4000	12000	1200	3600	1.02	1.25
5000	14000	1500	4200	1.05	1.30
6000	16000	1800	4800	1.08	1.35
7000	18000	2100	5400	1.11	1.39
8000	20000	2400	6000	1.14	1.44
9000		2700		1.17	

Note: If the work is performed at elevations greater than 3000 ft (900 m) above mean sea level, the minimum approach distance shall be determined by multiplying the distances in Table R-6 through Table R-9 by the correction factor corresponding to the altitude at which work is performed.