

## Overhead Powerlines

### Power Lines Are Everywhere

Injuries and deaths near power lines are all too common. Near misses are frequent. Avoiding contact with power lines requires common sense, a strong awareness of safety factors, and good decision making ability.

### Pause for Safety

- Hazards**
- Electrocutation
  - Electric shock
  - Burns
  - Falls

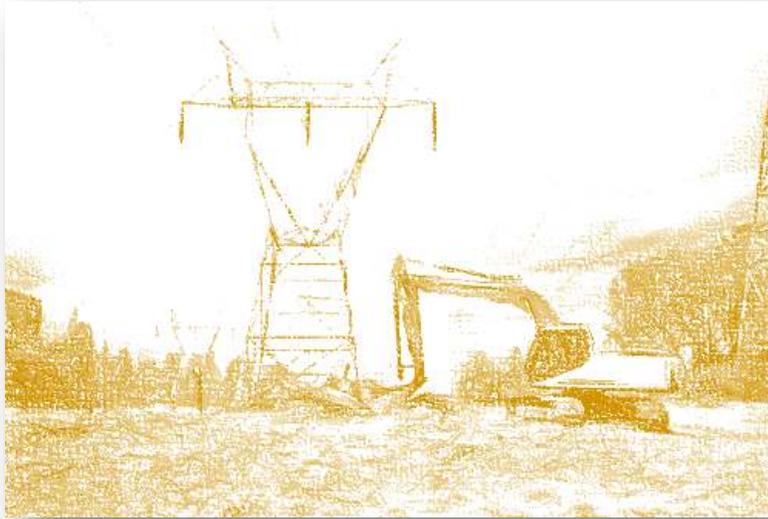
**PPE**



**Additional PPE**



- Controls**
- Safe work procedure, critical work procedure
  - All exposed workers must have Proper Awareness Training
  - [ATCO seven steps to electrical safety](#)
  - Hazard Assessment
  - PPE
  - Lockout
  - ERP ( Emergency Response Plan )
  - Fire Extinguisher



## Strategies and Procedures

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### Avoid working close to power lines.

- Recommended distances vary by jurisdiction and/or utility companies.
- Check with both your jurisdiction and electrical utility company when working, driving, parking, or storing materials closer than 15 m (49 feet) to overhead power lines.
- If you must be close to power lines, you must first call your electrical utility company and they will assist you.

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### Before work begins:

- conduct a hazard assessment and examine the work area to identify and correct hazards and to establish the safe limits of approach distances to overhead power lines
- Contact the electrical utility to determine the operating voltage of the line and confirm the safe limits of approach distances;

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Request assistance from the electrical utility if the work must be performed at a close distance to have the electrical utility disconnect or relocate the line if needed.

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If work must be done under live powerlines, work within these practices:

- Keep an eye out overhead at all times; take time to examine the hazard;
- Before operating equipment, make a safety plan that prevents contact with lines;
- Take extra care and precautions;
- Check the height of your equipment or load;
- Plan your moves – are there power lines to pass under or avoid?
- Look out for uneven ground that may cause your vehicle to weave, bob or bounce;

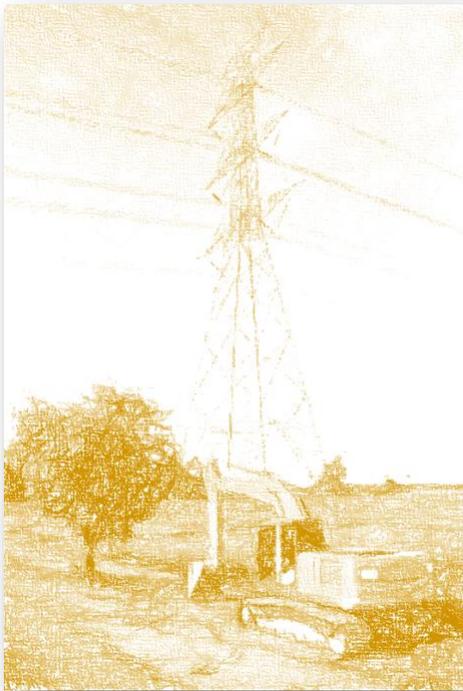
- Think about wind and temperature – they may affect the power line's height;
- Never ride or climb on equipment or a load when near a power line;
- Work around power lines to be done only during daylight hours;



- Don't ground your equipment around a power line;
- Do not allow equipment or objects to approach the overhead power line closer than the safe limit of approach specified;
- If work is being carried out near the safe limit of approach, use a trained signaler to act as an observer to ensure that the required distance is maintained. (Communication by radio or air horn);
- Do not place materials under or adjacent to the overhead power line if it reduces the clearance above ground required by O.H & S regulations. Contact the electrical utility for assistance to determine the required clearance between the power line and the ground;

- Do not allow excavations to reduce the support required for power poles. Contact the electrical utility to determine support required. Request line locates in case of grounding girds buried at the base of power poles;
- Remember electricity is invisible, don't take chances;
- Keep a safe working distance between your equipment and power lines – follow OHS Regulations which require you to stay clear of power lines. Don't go too close with people or equipment.

Do not enter an electrical power substation, or other marked areas.



\* Conductors must be insulated or covered throughout their entire length to comply with these groups.

### Limits of Approach

Limits of Approach Distances from Overhead Power Lines for Persons and Equipment

Operating voltage between phase conductors	Safe limit of approach
0 - 750 V insulated or polyethylene covered conductors*	0.3 m
0 - 750 V bare, uninsulated	1.0 m
Above 750 V insulated conductors (1) (2)†	1.0 m
0.75 kV - 40 kV	3.0 m
69 kV - 72 kV	3.5m
138 kV- 144 kV	4.0 m
230 kV - 260 kV	5.0 m
500 kV	7.0 m

Limits of approach are set to keep you working safely on the jobsite. The danger with overhead lines is that there is no protection on the wire. Electricity is looking for a path to the ground, so if contact is made you or your equipment can be its path.

Follow these steps when encountering an overhead line:

- Determine voltage (contact owner).
- Determine safe limits of approach (verify with owner).
- Ensure there is enough clearance to keep workers and equipment safe from their highest point
- Mark location of all overhead lines on plans and drawings.
- Set up signs warning of overhead power lines (from both directions).

† Conductors must be manufactured to rated and tested insulation levels and must be insulated or covered throughout their entire length.

- In extreme circumstances (poor visibility, very low line, etc.) the utility owner may be willing to mark the line with ribbons, PVC pipe, or other means.
- They may be willing to relocate the line. Request if needed.
- When trucks are dumping within 25 meters on either side of an overhead line, they **MUST** do so moving **AWAY** from the line where reasonably practicable.
  - Mark the 25 meter zone (with a paint line, cones, ribbons, etc.) and make drivers aware.
- Keep all unnecessary workers, vehicles, and equipment away from power lines
- Ground workers **MUST** keep clear of all equipment working near power lines, as electricity may be transferred through them if the equipment contacts a line while they are in contact with the equipment.
- If working under a power line or near the limits of approach cannot be avoided, a signal person **MUST** be used to direct the operator.

### Equipment Spotting

The only job of a designated signal person (or spotter) is to keep the equipment from contacting the power line.

The signaler must:

- know the limits of approach and be able to signal the operator quickly and easily if there is danger of contacting the power line.
- stand out from the other workers, and use clear signals easily understood by the operator.

### Emergencies

If your equipment or vehicle comes into contact with a power line:



### Accidental Contact

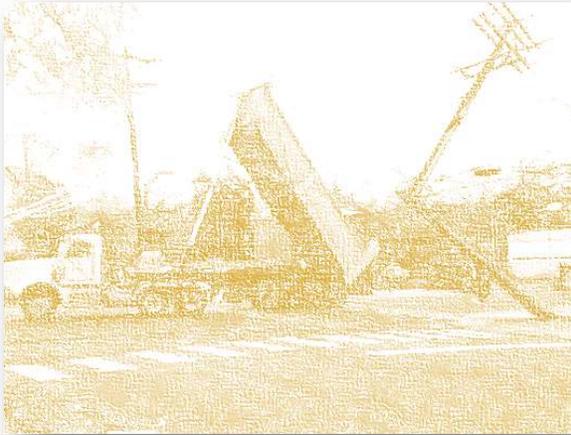
Power lines don't always jump or spark when down. A downed line may not have any sign that it is energized.

Just like ripples caused by throwing a rock into a pond, electricity travels through the ground in waves that lose power the further they travel.

- Stay back at least 10 meters. Call 911 for help.
- If a line comes down near you, **SHUFFLE WITH BOTH FEET IN CONTINUOUS CONTACT** until you are at least 10 meters away.
- Do not touch someone being shocked by a downed line or you will run the risk of being shocked.
- Stay inside your vehicle or on your equipment if a downed line touches it.
- If people try to help, tell them to stay away.
- Do not try to help someone trapped in a vehicle touching live wires.
- Wait for the utility workers to turn off the power and tell you it's safe to leave.

- **DO NOT** get out of your vehicle.

- Try to break contact with the lines by moving the vehicle at least 10m (32 feet) away;
  - Don't try to break contact if the cable or equipment appears to be welded to the line – this could cause the line to whip or snap;
- Call 911 **and** your local utility service for help.
- **Wait** for the electrical utility to come and they will tell you when it is safe to get out of your vehicle.
- Never try to rescue another person if you are not trained to do so.



- Shuffle at least 10 metres away from your vehicle before you take a normal step.
- Stay alert and keep other workers away from the area;
- Do not touch power lines with wood, the wood maybe damp and conduct electricity;
- If a line is on the ground, it could be charging the surrounding area.
  - Stay back 30 feet from the line.
  - If a line is touching a piece of equipment, do not come near to the equipment or touch it.
  - Never assume the breaker is open or the line is dead;



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If you must leave the vehicle (e.g., your vehicle catches on fire):

- Exit by jumping as far as possible - at least 45 to 60 cm (1.5 to 2 feet).
  - Never touch the vehicle or equipment and the ground at the same time.
  - Keep your feet, legs, and arms close to your body.
- Keep your feet together (touching), and move away by shuffling your feet.
  - Never let your feet separate or you may be shocked or electrocuted.

- Do not assume the lines are dead:
  - Transmission lines are on a 30-second breaker delay which reactivates three times;
  - A distribution feed line is two lines:
    - one carrying power into the property and
    - one carrying power back.
    - If contact is made with both of these wires, it is fatal;
  - Contact the electrical utility to turn off the power.

