Safe Operating Practice

Overhead Power Lines

This SOP describes safe methods of working around overhead power lines, identifying overhead line dangers and what to do in the event of a power line contact.

NOTE: If there is contact with a power line, this is a reportable Dangerous Occurrence – Saskatchewan Occupational Health and Safety Regulations (1996), Part II Regulation 9. Contact the power company, Supervisor, Manager, and Safety & Training Specialist. Fill out an incident notification as soon as possible. (The Training and Safety Specialist will contact Labor Relations Workplace Safety on behalf of the Ministry)

Potential Injuries: Electrical Contact, Death, Burns, Disability, Dismemberment.

Potential P&E Incidents: Overhead lines, Equipment Damage, Fire, Explosion.

Mandatory CSA Approved PPE: Hardhat, Footwear, Hi Vis Apparel.

Recommended CSA Approved PPE: Eyewear, Hand Wear and Hearing Protection.

Tools: Appropriate to the task

Equipment: Appropriate to the Task. For example: Outriggers, Arrow boards, First Aid Kit, Traffic Cones, Work Zone Signs Equipment, Communication Equipment and Fire Extinguisher.

Best Practice

1. Pre-Job Planning
   • All workers who operate machinery or equipment that could come in contact with power lines should look up and check for overhead power lines before beginning and during work activities.
   • Height of power lines may be obtained from the power company for around structures and stockpiles.
   • Erecting of proper warning signs near the power line in section yards and shops is one way of ensuring the warning of lines are in the area.
   • Ensure no materials are stored under or near overhead lines.

2. Limits of Approach
   • When operating machinery or equipment in close proximity to power lines, always maintain the limits of approach: 3–6 meters, depending on the voltage. For safe working distances, see the table below.
   • When excavating around a power pole, stay at least 2 meters from the pole at ground level and angle the excavation away from the pole as you go down.
   • Following are the minimum clearances for known power line voltages, from Saskatchewan OHS Regulations (1996)
Appendix Table 22: These clearances are measured as the radius around the conductor.

<table>
<thead>
<tr>
<th>Risk Factor</th>
<th>Column 1</th>
<th>Column 2</th>
<th>Column 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voltage Phase to Phase</td>
<td>Voltage to Ground</td>
<td>Non-ElectricalWorkers, Material and Equipment</td>
<td>QualifiedElectricalWorkers</td>
</tr>
<tr>
<td>kV</td>
<td>kV</td>
<td>Metres</td>
<td>Metres</td>
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<tr>
<td>230</td>
<td>133</td>
<td>6.1</td>
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<tr>
<td>138</td>
<td>79.8</td>
<td>4.6</td>
<td>1</td>
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<td>41.6</td>
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<td>0.3</td>
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<td>8.6</td>
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<td>0.3</td>
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<tr>
<td>4.16</td>
<td>2.4</td>
<td>3</td>
<td>0.15</td>
</tr>
</tbody>
</table>

- OHS Regulation 465 (2): ...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 set out in Column 1 of Table 22 above.
- OHS Regulation 465 (6): ...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 22 above, and that no part of a vehicle’s load comes within the minimum distance.

3. Power Line Identification

Following are guidelines for pole and kV identification.
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Workers must be trained/competent and aware of associated hazards. Use the “Take Ten” tool if needed. Trainees must work under supervision.

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**3. Operating Practice**

- No person shall approach or operate heavy equipment within 6 m of a power line of unknown voltage.
- When operating a tandem, sign truck, crane, loader, drill truck, etc., make sure before you lift or raise any piece of equipment, check for overhead power lines and continue watching for overhead power lines until your piece of equipment is raised to the working height.
- If the work area has the potential for equipment to come in contact with power lines because it would not be possible to keep this distance, the power company can be contacted to de-energize or reroute the circuit or provide guarding. Do not proceed until the power company has given assurance defining proper safeguards.
- If the required distance cannot be maintained, then alternative plans for dumping material, such as dumping before and after the power line, must be developed and implemented. If the truck dumps directly under the line, they are not to raise their boxes as high as normal and a Spotter must be used. Use of cranes, drill trucks and other machinery will have the similar circumstances for working around power lines.
- Operate the equipment at a slower-than-normal rate in the vicinity of power lines.
- Never park equipment in the vicinity of power lines.
- Extra caution should be taken when operators are in the process of gravelling approaches, emptying small amounts of material from a hydro-drum onto approaches.
- No tree/bush or brush trimming operations shall be undertaken where there is any possibility of contact with overhead electrical wires.
- When necessary assign a worker to act as a spotter to ensure that the required clearance is maintained. The spotter shall monitor equipment...
and material movement and give an instant **STOP** signal to the equipment operator when the equipment or load is too close to the electrical conductor.

- The Spotter must abide by the following:
- Review and know the limits of approach outlined above;
- Review and know the prearranged signals with equipment operators and truck drivers;
- Review and know the heights of truck boxes when fully raised;
- Be positioned at limits of approach from the truck and in clear view of driver;
- If available, use radio contact with equipment operators.

4. **Ground Worker Positioning**

- All ground workers and spotters must stay at least 10 meters away from equipment operating in the vicinity of power lines. If it contacts an energized line the electricity will go directly to ground by way of the shortest route.
- When there are downed lines remember that there may be dangers you can’t see in the immediate area. Your job is to stay away and secure the area to keep others safely away.
- If you are on energized ground and need to move away, you can avoid electric shock or electrocution by making sure there is no space between your feet. Shuffle your feet while moving out of the energized area. When shuffling, keep your feet touching. **Do Not Take Steps.**
  - **10 Meters to Safety.** Stay back at least 10 meters from any contacted equipment or downed power line.
  - Depending on voltage of downed power line, this distance may increase up to 32 meters.
  - Contact the power company, supervisor/manager and Safety Group immediately and be sure to specifically mention the downed wire situation.

5. **In The Case of Power Line Contact**

- The Operator should **STAY IN** the cab or on the equipment and remain calm.
- If you have to leave the equipment because of an emergency, jump clear of the equipment landing with feet together in upright position, and **SHUFFLE** with feet together, **DON’T STEP**, continue on with this process for a minimum of 30 meters.
- Contact with an overhead power line can cause damage to parts of your equipment. Tires can act as an insulator until they blow. If tires do not blow, drivers should carefully check them for damage once they are clear from the site and before they drive off. NEVER stand directly in front of a tire on a piece of equipment that has come in contact with a power line as a tire can blow off a unit after some time caused by the heat of the grounding effect.

**Related SOP’s**

Accident Site Management
Back up
Communication While Driving
Hand Tools
Safe Operating Practice

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Safe Lifting
Spotter Responsibilities
Work Zone Signing

Related Manuals
Equipment Operation Manuals
Safety Handbook
Traffic Control Device Manual
WHMIS

Related Training
Digger Derrick
Flag Person
Work Zone Traffic Accommodation