



High Voltage Power Lines

In the United States, electric distribution companies and providers transmit up to 500,000 volts of high-voltage current on the energy grid. High voltages require specialized switching, distribution panels, and access protocol, or severe injury and even death from electric shock is likely. This consequence is caused by direct or indirect contact, tracking through or across a medium. In the United States, there are approximately 1000 deaths per year, as a result of electrical injuries. Of these, 25% are construction workers experiencing approximately 100 high-voltage electrical fatalities (power lines or arc flashes), 100 low-voltage fatalities, and 50 lightning strike fatalities annually.

There are at least 30,000 shock incidents per year that are non-fatal. Each year, approximately 5% of all burn unit admissions in the United States occur as a result of electrical injuries.

High voltage (240 volts to 500 kV) caused 20% of electrical worker electrocutions and 30% of non-electrical worker electrocutions in construction. About 50% of all construction electrocutions involved more than 120/220 volts.

OSHA REQUIREMENTS CRITERIA:

Power Lines are addressed in the crane standard, but those requirements will be enforced utilizing the General Duty clause for (manlifts, excavators, dump trucks etc.)

Specific code for articulating boom lifts - 1926.453(b)(2)(xi) The insulated portion of an aerial lift shall not be altered in any manner that might reduce its insulating value.

1926.1408(g)(1)(ii) Power lines are presumed to be energized- unless the utility owner/operator confirms that the power line has been and continues to be deenergized and visibly grounded at the worksite.
1926.1408(g)(1)(iii) Power lines are presumed to be

Uninsulated- unless the utility owner/operator or a registered engineer who is a qualified person with respect to electrical power transmission and distribution confirms that a line is insulated.

1926.1408(b)(1) That all operators and employees are unknowing - Conduct a planning meeting with the operator and the other workers who will be in the area of the equipment or load to review the location of the power line(s) and the steps that will be implemented to prevent encroachment/electrocution.

1926.1408(a)(2)(i) You will need to deenergize and ground lines. Confirm from the utility owner/operator that the power line has been deenergized and visibly grounded at the worksite OR

1926.1408(a)(2)(ii) You will need to maintain a 20-foot clearance. Ensure that no part of the equipment, load line, or load (including rigging and lifting accessories), gets closer than twenty feet to the power line by implementing the measures specified in paragraph (b) of this section!

1926.1408(a) You will need to document all hazard assessments and precautions inside the work zone, before beginning equipment operations.

REQUIRED RESPONSIBILITIES:

1926.1408(a)(1) Identify the work zone by:

1926.1408(a)(1)(i) Demarcating boundaries (such as with flags, or a device such as a range limit device or range control warning device) and prohibiting the operator from operating the equipment past those boundaries, **or...**

1926.1408(b)(3) Erect and maintain an elevated warning line, barricade, or line of signs, in view of the operators, equipped with flags or similar high-visibility markings, at 20 feet from the power line (if using Option (2) of

this section) or at the minimum approach distance under Table A (see § 1926.1408) (if using Option (3) of this section). If the operators are unable to see the elevated warning line, a dedicated spotter must be used as described in § 1926.1408(b)(4)(ii) in addition to implementing one of the measures described in § 1926.1408(b)(4)(i), (iii), (iv) and (v).

1926.1408(b)(4) Implement at least one of the following measures:

1926.1408(b)(4)(i) A proximity alarm set to give the operator sufficient warning to prevent encroachment.

1926.1408(b)(4)(ii) A dedicated spotter who is in continuous contact with the operator. Where this measure is selected, the dedicated spotter must:

1926.1408(b)(4)(ii)(A) Be equipped with a visual aid to assist in identifying the minimum clearance distance. Examples of a visual aid include, but are not limited to: A clearly visible line painted on the ground; a clearly visible line of stanchions; a set of clearly visible line-of-sight landmarks (such as a fence post behind the dedicated spotter and a building corner ahead of the dedicated spotter).

1926.1408(b)(4)(ii)(B) Be positioned to effectively gauge the clearance distance.

1926.1408(b)(4)(ii)(C) Where necessary, use equipment that enables the dedicated spotter to communicate directly with the operator.

1926.1408(b)(4)(ii)(D) Give timely information to the operator so that the required clearance distance can be maintained.

APPLICATION SUMMARY OF OSHA ELECTRICAL REQUIREMENTS:

1. Electric lines and equipment shall be considered and treated as energized unless they have been deenergized in accordance with § 1926.961.
2. Make sure you are trained in electrical safety for the work you will be doing.

3. Keep at least 20 feet from live overhead power lines.
4. Keep metal objects away from live electrical circuits/parts.
5. De-energize and lock out or tag out electrical circuits/parts you will be working on or near.
6. Never work live electrical circuits/parts unless in accordance with a permit system with specific procedures and if you are qualified to do so.

WHAT YOU NEED TO KNOW:

1. **Planning Meeting:** Meet with operators and workers to review power line locations and steps to prevent encroachment.
2. **Non-Conductive Tag Lines:** Tag lines must be non-conductive.
3. **Warning Line:** Erect a visible warning line or barricade with high-visibility markings 20 feet from the power line or at the minimum approach distance. If not visible, use a dedicated spotter in continuous contact with the operator.
4. **Electrocution Risk:** Workers often touched metal objects energized by live electrical equipment or overhead power lines.
5. **Prevention Options:**
 - Use a proximity alarm or a dedicated spotter in continuous contact with the operator.
 - The spotter should use visual aids, maintain clearance distance, and communicate with the operator.
 - Use devices that warn or limit the operator's movement to prevent encroachment.
6. **Insulating Device:** Install an insulating link between the load line and the load.
7. **Electrical Hazards:** Take hazards seriously as exposures aren't always obvious. Follow NFPA 70E rules.

"1926.1408 - Power Line Safety (up to 350 KV)--Equipment Operations. | Occupational Safety and Health Administration." www.osha.gov, www.osha.gov/laws-regs/regulations/standardnumber/1926/1926.1408.

Zemaitis, Michael R, et al. "Electrical Injuries." Nih.gov, StatPearls Publishing, 31 July 2019, www.ncbi.nlm.nih.gov/books/NBK448087/.

"1926.453 - Aerial Lifts. | Occupational Safety and Health Administration." www.osha.gov, www.osha.gov/laws-regs/regulations/standardnumber/1926/1926.453.

OUR PURPOSE

Lead. Make a difference. Build a better future!

OUR VALUES

Safety: First. Last. Always!

Steadfast Integrity: Be honest. Treat other with respect.

Exceptional Service: Align goals. Add value. Develop lasting relationships.

Commitment to Excellence: Take ownership. Constantly improve.

Focus on Team: Listen. Collaborate. Communicate. Execute.

