[PP 09/01/2019 - 09/14/2019]
Overhead Obstructions and Clearance Limits

Mobile crane hits wire, catches fire – Reseda, Ca [April 14, 2019] Daily News

A mobile crane operator was only slightly injured after the crane he was operating struck high voltage line. The accident happened in an alley south of Keswick Street. When the boom struck the wire the operator was blown from his seat and landed on nearby garbage bins. Firefighters quickly arrived on the scene and extinguished the fire before any structures were damaged. The operator was released at the scene with only minor lacerations.

Overhead line safety precautions

Please remember the following safety guidelines when working near overhead power lines:

- **Keep a safe distance**. Ten feet is generally considered the minimum safe distance.
- **Stay clear of downed power lines.** Call 911 and keep everyone 100 feet away from the line.
- **Look up before raising long-handled tools and equipment** to make sure they won't come in contact with a power line. Always carry them horizontally.
- **Make sure ladders can't come into contact with power lines** .
- **Work only in good weather.** Thunderstorms, rain, winds and damp or icy ground can cause you to lose control and come into contact with power lines.
- **Don't assume a power line is insulated.** Although overhead power lines may appear to be insulated, often these coverings are intended only to protect metal wires from weather conditions and may not protect you from electric shock.

§ 1612.1. Power Line Safety (Up to 350 kV) - Equipment Operations.

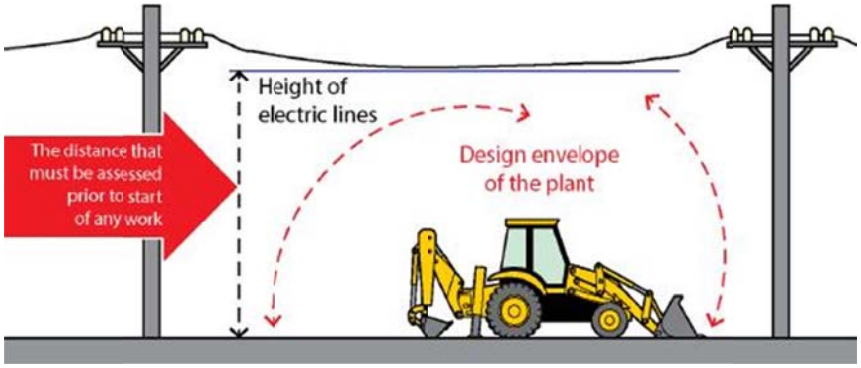
(a) Hazard assessments and precautions inside the work zone. **Before beginning equipment operations, the employer shall**:

(1) Identify the work zone by either:

(A) 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

(B) Defining the work zone as the area 360 degrees around the equipment, up to the equipment's maximum working radius.

Figure 1: Did the contractor do a Contact Analysis?



(2) Determine if any part of the equipment, load line or load (including rigging and lifting accessories), if operated up to the equipment's maximum working radius in the work zone, **could get closer than 20 feet to a power line**. If so, the employer shall meet the requirements in Option (1), Option (2), or Option (3) of this section, as follows:

(A) Option (1) - Deenergize and ground. Confirm from the utility owner/operator that the power line has been deenergized and visibly grounded at the worksite.

(B) Option (2) - 20 foot clearance. Ensure that no part of the equipment, load line, or load (including rigging and lifting accessories), gets closer than 20 feet to the power line by implementing the measures specified in subsection (b).

(C) Option (3) - Table A clearance.

1. Determine the line's voltage and the minimum approach distance permitted under Table A (see Section 1612.1).

2. Determine if any part of the equipment, load line or load (including rigging and lifting accessories), while operating up to the equipment's

maximum working radius in the work zone, could get closer than the minimum approach distance of the power line permitted under Table A. If so, then the employer shall follow the requirements in subsection (b) to ensure that no part of the equipment, load line, or load (including rigging and lifting accessories), gets closer to the line than the minimum approach distance.

(b) Preventing encroachment/electrocution. Where encroachment precautions are required under **Option (2) or Option (3)** of this section, **all of the following requirements shall be met**:

(1) 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.

(2) If tag lines are used, they shall be non-conductive.

(3) Erect and maintain an elevated warning line, barricade, or line of signs, in view of the operator, 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 (if using Option (3) of this section). If the operator is unable to see the elevated warning line, a dedicated spotter shall be used as described in subsection (b)(4)(A) in addition to implementing one of the measures described in subsections (b)(4)(B) and (C).

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

(A) A dedicated spotter who is in continuous contact with the operator. Where this measure is selected, the dedicated spotter shall:

1. Be equipped with a visual aid to assist in identifying the minimum clearance distance.
2. Be positioned to effectively gauge the clearance distance.
3. Where necessary, use equipment that enables the dedicated spotter to communicate directly with the operator.
4. Give timely information to the operator so that the required clearance distance can be maintained.

(B) A device that automatically warns the operator when to stop movement, such as a range control warning device. Such a device shall be set to give the operator sufficient warning to prevent encroachment.

(C) A device that automatically limits range of movement, set to prevent encroachment.

(5) The requirements of subsection (b)(4) do not apply to work covered by the High-Voltage Electrical Safety Orders.

(c) Voltage information. Where Option (3) of this section is used, the utility owner/operator of the power lines shall provide the requested voltage information within two working days of the employer's request.

(d) Operations below power lines.

(1) No part of the equipment, load line, or load (including rigging and lifting accessories) is allowed below a power line unless the employer has confirmed that the utility owner/operator has de-energized and (at the worksite) visibly grounded the power line, except where one of the exceptions in subsection (d)(2) applies.

(2) EXCEPTIONS. Subsection (d)(1) is inapplicable where the employer demonstrates that one of the following applies:

(A) The work is covered by the High-Voltage Electrical Safety Orders.

(B) For equipment with non-extensible booms: The uppermost part of the equipment, with the boom at true vertical, would be more than 20 feet below the plane of the power line or more than the Table A of this section minimum clearance distance below the plane of the power line.

(C) For equipment with articulating or extensible booms: The uppermost part of the equipment, with the boom in the fully extended position, at true vertical, would be more than 20 feet below the plane of the power line or more than the Table A of this section minimum clearance distance below the plane of the power line.

(D) The employer demonstrates that compliance with subsection (d)(1) is infeasible and meets the requirements of Section 1612.3.

(e) Power lines presumed energized.

The employer shall assume that all power lines are energized unless the utility owner/operator confirms that the power line has been and continues to be de-energized and visibly grounded at the worksite.

(f) When working near transmitter/communication towers where the equipment is close enough for an electrical charge to be induced in the equipment or materials being handled, the transmitter shall be deenergized or the following precautions shall be taken:

(1) The equipment shall be provided with an electrical ground.

(2) If tag lines are used, they shall be non-conductive.

(g) Training.

(1) The employer shall train each operator and crew member assigned to work with the equipment on all of the following:

(A) The procedures to be followed in the event of electrical contact with a power line. Such training shall include:

1. Information regarding the danger of electrocution from the operator simultaneously touching the equipment and the ground.

2. The importance to the operator's safety of remaining inside the cab except where there is an imminent danger of fire, explosion, or other emergency that necessitates leaving the cab.

3. The safest means of evacuating from equipment that may be energized.

4. The danger of the potentially energized zone around the equipment (step potential).

5. The need for crew in the area to avoid approaching or touching the equipment and the load.

6. Safe clearance distance from power lines.

(B) Power lines are presumed to be energized unless the utility owner/operator confirms that the power line has been and continues to be de-energized and visibly grounded at the worksite.

(C) 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.

(D) The limitations of a range control device, if used.

(E) The procedures to be followed to properly ground equipment and the limitations of grounding.

(2) Employees working as dedicated spotters shall be trained to enable them to effectively perform their task, including training on the applicable requirements of this section.

(3) Training under this section shall be administered in accordance with Section 1618.4(g).

(h) Devices originally designed by the manufacturer for use as: A safety device (see Section 1615.1), operational aid, or a means to prevent power line contact or electrocution, when used to comply with this section, shall meet the manufacturer's procedures for use and conditions of use.

TABLE A - MINIMUM CLEARANCE DISTANCES

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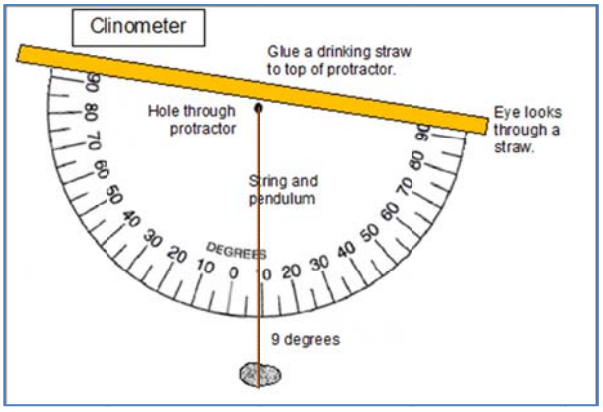
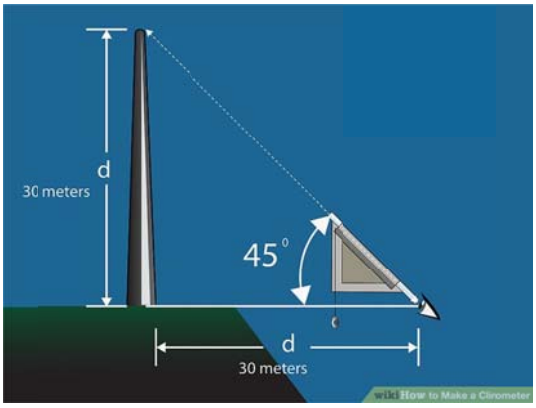
Voltage *(nominal, kV, alternating current)*	*Minimum clearance distance* *(feet)*
up to 50	10
over 50 to 175	15
over 175 to 350	20
over 350 to 550	27
over 550 to 1,000	45

USING A SIMPLE CLINOMETER TO MEASURE HEIGHT





To use the clinometer, hold the base (formed by the wooden sight) uppermost, so that the plumb line hangs down vertically (as shown above). Hold the clinometer out at arms length and sight along it, until your eye and your arm make a straight line to the object being measured. Someone else should then read off the angle made by the plumb line on the protractor (Z).