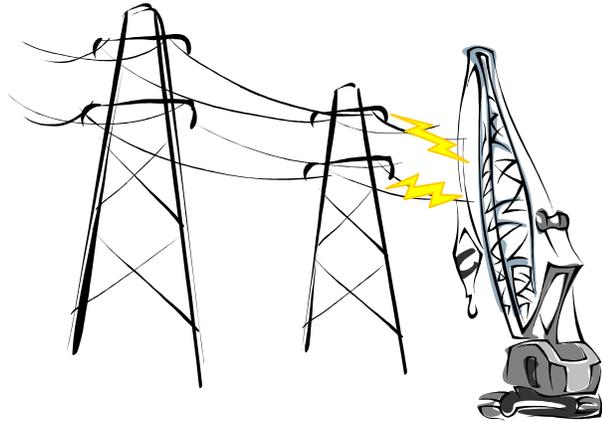


Crane Operations and Powerlines Safety

Crane operations pose many hazards. One of the hazards involved with crane operations is the risk of electrocution from working too close to powerlines. Supervisors, operators, and crew members must use extreme caution and be aware of these power line hazards at all times.



OSHA addresses power line safety in detail in the new standard regarding mobile cranes, 1926 subpart CC. This HATbox will cover the OSHA requirements regarding mobile crane operations near powerlines up to 350kV (1926.1408).

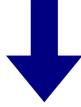
OSHA gives us specific requirements that must be met BEFORE beginning equipment operations near powerlines and DURING equipment operations near powerlines.

Before beginning equipment operations the employer MUST:

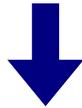
- First, identify the work zone by *either* of the following 2 methods: (1) demarcate (*set*) the boundaries and prohibit operations past those boundaries *OR* (2) define the work zone as 360 degrees around the equipment up to the equipment's maximum working radius.
- Next, determine if any part of the equipment (including boom), load line, or load could get closer than 20 feet to a power line. If any part of the equipment, load line, or load can get ANY closer than 20 feet to a power line then the employer MUST meet the requirements in Option 1, Option 2, *OR* Option 3 as listed on the following pages. (*Option 1 is the preferred choice. If Option 1 is not possible then Option 2 should be used. Option 3 should ONLY be used after the employer has determined that neither Option 1 nor Option 2 will work.*)

Option 1: De-energize and Ground

CONTACT the utility owner/operator to inform them that it is necessary for your crew to work within the 20 foot clearance



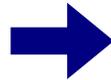
REQUEST that the utility owner/operator de-energize & visibly ground the powerlines in that work area.



Work must NOT proceed until the utility owner/operator has CONFIRMED that the powerlines are de-energized & visibly grounded!



CONFIRM from the utility owner/operator that powerlines are **de-energized & visibly grounded** at the worksite.



ONLY AFTER confirmation may operations proceed closer than 20 feet to the power line.

Option 2: Minimum 20 Foot Clearance

The following encroachment measures **must** be used:



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 location of power lines and steps to be implemented to prevent encroachment and electrocution.



2. If taglines are used, they **must** be nonconductive taglines



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.

*If the operator is unable to see the elevated warning line then a dedicated spotter who is in continuous contact with the operator **MUST** be used AND at least one of the following additional measures must be in place:*

- Proximity alarm
- Warning device (such as a range control warning device)
- Range of movement limiter



4. At least one of the following additional measures must be in place:

- Proximity alarm
- Dedicated spotter (equipped with a visual aid, positioned to effectively gauge the clearance distance, equipped to communicate directly with the operator, and able to give timely information to the operator to maintain clearance.
- Warning device (such as a range control warning device)
- Range of movement limiter



Work may proceed NO CLOSER than 20 feet

Option 3: Minimum 20 Foot Clearance

Determine line voltage and minimum clearance distance permitted under Table A (1926.1408)



NOTE:

When Option #3 is used the utility owner/operator of the power lines *must* provide the requested voltage information within two working days of the employer's request.

TABLE A (1926.1408)

Voltage (kV)	Minimum Clearance Distance (Feet)
up to 50	10
Over 50 to 200	15
Over 200 to 350	20
Over 350 to 500	25
Over 500 to 750	35
Over 750 to 1,000	45
Over 1,000	Established by the utility owner/ operator

Note: The value that follows "to" is up to and includes that value. For example, over 50 to 200 means up to and including 200kV.



Next determine **if any part of the load could get closer** than the Table A Minimum Clearance Distance.

If any part of the load could get closer than the Table A minimum clearance distance a meeting must be held between the supervisor, the divisional safety manager, and the divisional manager to address the requirements of 1926.1410 (NO EXCEPTIONS) and the encroachment measures of option 2 (see page 3) must be followed.

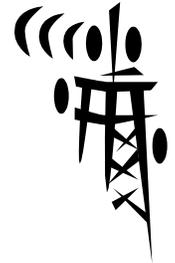


Work may proceed OUTSIDE the clearance distance zone from Table A

During equipment operations NO PART of the equipment, load line, or load 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 (OPTION 1).

OSHA allows only 2 exceptions to this rule: (1) The employer can demonstrate that the work is covered by Subpart V (Power Transmission) OR (2) The employer can demonstrate that the uppermost part of the equipment with the boom fully extended at true vertical would be more than 20 feet **BELOW** the power line or more than the Table A minimum clearance distance.

During work near transmitters or communication towers where the equipment is close enough for an electrical charge to be induced in the equipment or materials being handled, the transmitter must be de-energized OR the equipment must be provided with an electrical ground. If tag lines are used, they must be non-conductive.



For cranes traveling under or near powerlines on a construction site WITH NO LOAD, the employer **MUST** ensure:

- the clearance distances specified in Table T are maintained
- the boom/mast and boom/mast support system are lowered sufficiently to meet table T clearance distances
- the effects of speed and terrain on equipment movement are considered so that those effects do not cause the Table T minimum clearance distances to be breached
- a dedicated spotter is used
- and precautions are taken for traveling in poor visibility.

Table T – Minimum Clearance Distances While Traveling With No Load	
Voltage (nominal, kV, alternating current)	While Traveling – Minimum clearance distance (feet)
up to 0.75	4
over .75 to 50	6
over 50 to 345	10
over 345 to 750	16
Over 750 to 1,000	20
Over 1,000	(as established by the utility owner/operator or registered professional engineer who is a qualified person with respect to electrical power transmission and distribution)

ALL OPERATORS AND EMPLOYEES MUST BE MADE AWARE OF THE FOLLOWING:

ALWAYS CONSIDER power lines to be energized unless the utility owner/operator has confirmed that the power line is de-energized and visibly grounded at the worksite.

ALWAYS CONSIDER power lines to be un-insulated unless the utility owner/operator has confirmed that the line is insulated.

If an insulating link/device, proximity alarm, and/or a range control device is used the operator and all crew members need to know the limitations of the link/device or alarm AND the proper equipment grounding procedures as well as the limitations of grounding.

Procedures to be followed in the event of electrical contact with a power line:

- If the crane contacts a power line, the supervisor and all crew members should be NOTIFIED IMMEDIATELY.
- DO NOT TOUCH the crane or the load or the rigging. Contact between the equipment and the ground can result in electrocution.
- If the crane contacts a power line, the crane operator should remain in the cab unless there is danger of fire or other emergency.
- If at all possible the crane operator should boom back away from the power line.
- Notify the utility owner/operator to have them de-energize the power line.
- If the crane operator must leave the cab, the operator should NEVER touch the crane and the ground at the same time. The recommended procedure for evacuating the crane is to jump from the crane and then shuffle with very small steps away from the crane to a safe distance.
- Any workers in the area around the crane should also shuffle away from the crane to a safe distance.
- The best way to AVOID contact with power lines and electrocution is to ALWAYS maintain a safe clearance distance from powerlines during operation.



Current can flow outward through ground in a ripple pattern from the equipment in contact with a power line.

Course Name		Course Description	
Crane Operations and Powerlines Safety		HATBOX	
Employee Name (please print neatly)		Instructor Name (please print neatly)	
Employee # or S.S. # (please print neatly)	Score	Job #	Date

Crane Operations and Power Line Safety

QUIZ

1. T ___ F___ If the owner of the power line de-energizes and grounds the power line we can work within 20 feet.

2. T ___ F___ A dedicated spotter's sole responsibility is to watch the separation between the power line and the equipment and notify the operator if it is breached.

3. T ___ F___ If a tagline is used, the tagline must be conductive.

4. T ___ F___ No part of the equipment, load line, or load is allowed below a power line unless the employer has confirmed that the utility owner/operator has de-energized and grounded the line.

5. T ___ F___ The minimum clearance distance for a power line up to 350 kV is 20 feet.

6. T ___ F___ While traveling under power lines with no load you do not need a designated spotter.

7. T ___ F___ The employer must train each operator and crew member assigned to work with the equipment on the hazards of working near powerlines.

8. T ___ F___ An Encroachment Warning means to 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.

9. T ___ F___ You do not need to know how close you are to power lines before you start work.

10. T ___ F___ If the crane contacts a power line the operator should leave the crane and go home.

Course Name		Course Description	
Crane Operations and Powerlines Safety		HATBOX	
Employee Name (please print neatly)		Instructor Name (please print neatly)	
Employee # or S.S. # (please print neatly)	Score	Job #	Date

Crane Operations and Power Line Safety
ANSWER KEY

1. T F__ If the owner of the power line de-energizes and grounds the power line we can work within 20 feet.
2. T F__ A dedicated spotter's sole responsibility is to watch the separation between the power line and the equipment and notify the operator if it is breached.
3. T__ F If a tagline is used, the tagline must be conductive.
4. T F__ No part of the equipment, load line, or load is allowed below a power line unless the employer has confirmed that the utility owner/operator has de-energized and grounded the line.
5. T F__ The minimum clearance distance for a power line up to 350 kV is 20 feet.
6. T__ F While traveling under power lines with no load you do not need a designated spotter.
7. T F__ The employer must train each operator and crew member assigned to work with the equipment on the hazards of working near powerlines.
8. T F__ An Encroachment Warning means to 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.
9. T__ F You do not need to know how close you are to power lines before you start work.
10. T__ F If the crane contacts a power line the operator should leave the crane and go home.