Power Line Hazards Awareness

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Chapter 1 – Introduction to Power Line Hazards

Key concepts to be discussed within this chapter include:

1. The tragic losses caused by power line accidents.
2. The Anatomy of Power Transmission.
3. Causes of power line contacts.
4. Occupational Safety and Health Administration (OSHA).

1.1 Tragic Losses

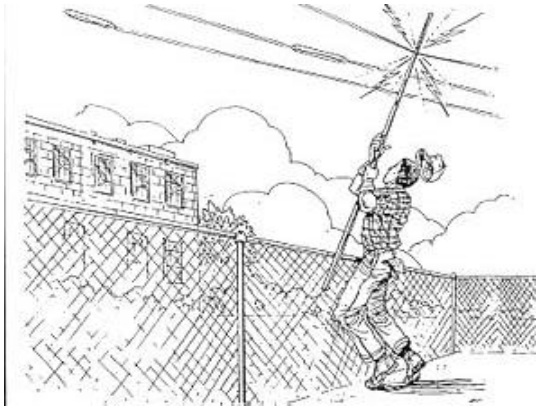
Every year, scores of workers lose their lives because of electrocutions caused by overhead and underground power lines. Thousands more sustain injuries from related burns that cause unimaginable pain. Electricity can actually cook your body's tissue from the inside out. The scars from such injuries won't go away, but with careful planning and prevention, many future tragedies can.

1.1(a) Human Cost

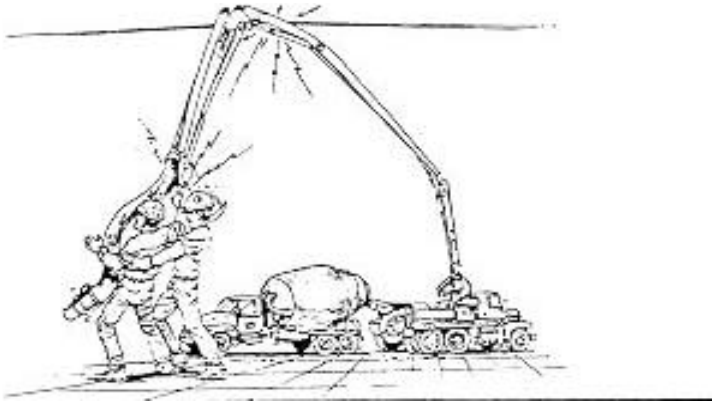
The following *Fatal Facts* are actual fatalities reported to OSHA and were taken from OSHA's web site at www.osha.gov.

✍✍An operator of a truck-mounted crane was electrocuted when the boom load line contacted a 7200-volt overhead power line.

✍✍Workers installing a chain link fence directly under an overhead power line were electrocuted when one of the workers raised a long section of top rail and brought it into contact with the line.



✍✍The boom of a concrete pump contacted overhead power lines as it was guided over a pour. Both the nozzleman, and a fellow worker who attempted to assist him, received massive electrical shocks and burns.



As soon as an electrical contact occurs, a worker's life and the lives of family and friends change forever. Depending on the severity of injury, the worker must often go through a long recovery that may include surgeries, physical and occupational therapy and counseling. This doesn't begin to address the psychological, social and financial burdens placed on the worker's family.

1.1(b) Costs to the Contractor

Beyond the tragedy of human suffering from these needless accidents are the very sobering consequences to contractors. According to one major insurance carrier, the average claim cost for a power line electrocution is over $550,000. Consider some of the direct and indirect costs of such an occurrence:

Direct Costs

Medical costs up to limit of deductible
Increased workers compensation premium
Replacement of damaged equipment
Liability lawsuits

Indirect Costs

Reduced productivity/efficiency of crew(s)
Costs to reschedule work
Wages for supervision from accident
Costs incurred by delays
Cost of training/orienting new worker(s)
Costs of overtime required because of accident
Administrative hours devoted to accident
Wages paid injured worker for time not worked
Wages paid to other workers for time not worked
Clean-up, repair, replacement and stand-by costs

Survival in the competitive business of construction means a full appreciation for the economic toll of any accident, regardless of severity. When an injury occurs, your crew discontinues its work and is slow to resume it. Staff hours are devoted to investigation and follow-up. Your company is more closely scrutinized when it purchases insurance. The insurance you do purchase is more expensive. Your company is less competitive.

1.2 The Anatomy of Power Transmission

Electrical power is brought to us through a three part system: “high power transmission lines” running from generating stations to substations, “distribution” lines, the same lines that run through most of our neighborhoods and jobsites, and “service drops” running from poles to utility customers. The majority of the power line contacts reported to OSHA involved overhead “distribution” lines; this is most likely due to their location in respect to most construction work and the frequency in which they appear.

Transmission Line

Distribution Line

Service-Drop Line

The root cause of reported accidents isn’t always clear. Many investigations conclude that workers just didn’t pay attention or didn’t take the hazard posed by the power lines seriously. We’ve all grown up around power lines and frequently do take them for granted. One common trend in most power line cases is clear however: workers, and all too often their supervisors, have an insufficient understanding of the hazards posed by overhead power lines. Many operate under some false assumptions…

Power Line Myths

Myth #1 "Overhead power lines don't carry enough power to hurt you"

Reality: Overhead power lines carry voltages ranging from 120 to 750,000 volts. For an electrocution to occur, a path to ground must be created for the current. If your body touches a power source, the electricity will attempt to travel through your body, seeking ground or another power source with a different electrical potential. Because of the resistance in our bodies, the path taken by the current heats up and burns the body tissue inside us. Electricity leaves the body violently through that portion in contact with ground or a further path to ground, often leaving an "exit wound".

Myth #2 "Overhead power lines are mostly insulated"

Reality: Overhead power lines are not "mostly insulated" Any covering you see on an overhead line is generally there for weather protection, not insulation. If you touch a power line, covered or bare, you could die.

Myth #3 "You have to contact an overhead power line to sustain injury."

Reality: Electricity can arc over to an object. Although an arc's initial striking distance isn't appreciable, "brushing" up against a line with a conductive object, or simply having it within inches of the line and then backing it away can draw an arc out to several feet before it is extinguished. Your body doesn't require sustained contact with a current source to suffer an injury.

Electrical injuries are caused by electricity and heat. When an electrical current passes through the body, a worker will feel a tingle from 0.5 to 1.0 milliamps (mA). At levels between 11 and 16 mA, the worker can't let go. At 60 mA, the heart can stop. It is estimated that muscle damage due to electrocution occurs at levels of 1,500 mA and greater, (Table 1).

Table 1 – Threshold Effects of Electrical Power

Response	*Threshold Current*
Perception	0.5 – 1.0 mA
Let-go	11 – 16 mA
Ventricular Fibrillation	60 mA
Muscle Damage	1,500 mA

Note: 1,000 mA equals 1 ampere.

Depending on the current levels and length of exposure, the effects of heat generated by the electricity will vary. If the current is high enough, temperatures exceeding 1,800 degrees Fahrenheit can be generated. At this temperature, skin can vaporize instantly.

Remember this…

A typical electric tool (drill, saw, etc.) uses anywhere between 2 to 5 amps (2,000 – 5,000 mA) or more. So, the next time you plug in a tool, you are potentially exposed to enough electricity to kill a person several time over. Always inspect the tool and the cord before each use, and never use damaged or defective equipment.

1.3 Causes of Power Line Accidents

How and why do power line contacts occur?

According to the Occupational Safety and Health Administration, the leading causes of accidental power line contacts involved heavy equipment (cranes, excavators, etc.), long-handled tools (bull floats, cutting torches, etc.), and ladders and other items carried by workers while in close proximity to power lines.

Whatever the object is that actually makes contact with the power line; it usually is a result of the handling and storage of material. We can identify high-risk areas (under power lines) and plan material handling and storage operations away from them. Remember, power lines are not insulated; they are like lethal weapons waiting to go off.

High-risk equipment and activities when working around power lines include:

a) Heavy Equipment
    1. Cranes
    2. Drilling rigs
    3. Excavators/Backhoes
    4. Concrete pumper
    5. Dump trucks

b) Long-handled tools
c) Ladders
d) Aerial lifts
e) Scaffolds
f) Material Handling and Storage

To eliminate inadvertent power line contacts; identify what equipment and activities are at high-risk.

Think About It…

Write down some high-risk activities or equipment that you work with or around that could cause an inadvertent power line contact:

_____

_____

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(a) Heavy Equipment

(1) Cranes

The most common types of equipment involved in power line-related fatalities are cranes. When a contact occurs, the crane almost always hits the overhead line with its boom or load line. The resulting injury depends on the type of crane involved.

Boom Trucks

Boom trucks designed with controls mounted on the truck chassis and those equipped with pendant controls place the operator in direct contact with the ground. If a power line contact occurs, the operator is likely to sustain an electrocution injury.

Some manufacturers offer boom truck designs which place the operator on an elevated platform, isolated from the ground.

Others incorporate pendant controls activated by radio frequency or fiber-optics. It is important to note that even when cranes are equipped with radio or fiber-optic controls, an operator can still sustain injury as current can flow through the ground, creating a hazard.

Mobile Cranes

Mobile cranes isolate the operator from the ground. With this type of equipment, it is most often the riggers and other personnel positioned on the ground near the equipment that are killed or injured. If the rigger is touching the load, the crane's load line, or even guiding the load with a tag line of nonconductive material that is moist or dirty, electricity can pass through those objects and the worker, seeking a path to ground.

Operators of mobile cranes are usually protected from the affects of the electric current because they are isolated from ground.

Because of contact with the ground, riggers and others standing around the crane are not protected.

(2) Drilling Rigs

Drilling Rigs & Horizontal Directional Drilling (HDD) machines have the potential for contacting power lines both above and below the ground. Before beginning any type of underground work, it is essential to determine the location of all underground utilities. Failure to do so could result in injury and/or death. Also, failure to notify your states local one-call system is a violation that could bring thousands of dollars worth of fines and hold the contractor liable for any damages as a result of any utility contact.

(3) Excavators and Backhoes

Excavators & backhoes are similar to drilling rigs in that they too require consideration both overhead and underground. Many types of work that requires the use of excavating equipment often take place along side of roads where power lines are present. By utilizing equipment with limited reach potential and not storing pipe, trench boxes and other material underneath power lines can reduce the likelihood of a contact.

(4) Concrete Pumps

Concrete pumps usually strike overhead power lines during the raising, lowering or moving of the hose. Multiple worker injury is often the case with concrete pumps due to the number of different workers that are required to operate this equipment.

(5) Dump Trucks

Dump trucks and other material hauling equipment often pass underneath power lines. With the truck in a raised position, the clearance around power line decreases. Careful planning as to where and how equipment is used in proximity to overhead power lines must be conducted before these trucks arrive to the job.

Think About It…

Go back to your list of high-risk activities and equipment on page 7; think how power line contacts occur with the equipment you work with.

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_____

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_____

(b) Long Handled Tools

Long handled tools used around power lines can get entangled into overhead power lines. Aluminum poles used as extension devices for cleaning, painting or finishing concrete work have all been the cause of power line fatalities. When using these long handled tools, always maintain the proper line clearance distance.

(c) Ladders

The most common type of ***ladder*** involved in power line electrocutions is the metal extension ladder. A study conducted by the Consumer Product Safety Commission (CPSC) on ladder electrocutions found that of 54 ladder-related fatalities over an eight-year period, all involved metal ladders. When ladder contacts occur, it is usually during raising, lowering or repositioning of the ladder while it is extended.

To avoid a power line contact when using a ladder:

- Use only non-conductive ladders.
- Don't carry or move extension ladders fully or partially extended.
- Get help moving ladders to maintain control.

(d) Aerial Lifts

An aerial lift could come into contact with overhead power lines while it is being raised or lowered, however, the most risk occurs while moving the lift in a raised position. Also, if the aerial lift that you are operating has special insulation properties, this insulation must not be altered in any way.

(e) Scaffolds

Working from ***scaffolds*** means working at heights, and the most risk of contact occurs during the erection and dismantling of the scaffold. Using long-handled tools while on a scaffold is also dangerous due to the fact that the distance between you and the power lines are already decreased by the height of the scaffold.

(f) Material Handling and Storage

A common problem on construction sites is insufficient space for storage. This frequently makes the areas under power lines tempting locations for staging and lay down operations. Such areas are frequently along right of ways and site access routes. It should be no surprise that most studies of power line accidents conclude that these locations pose the greatest risk. Using the area underneath power lines for storage of materials is an invitation for disaster. By avoiding these unsafe storage locations, you can reduce or even eliminate the chances of an inadvertent power line contact.

Whatever the reasons are for power line accidents, a construction company's responsibility to ensure that its workers are trained in recognizing and avoiding the hazard is a matter of law.

1.4 Occupational Safety and Health Administration (OSHA)

The Occupational Safety and Health Administration (OSHA) have standards for working around power lines (overhead and underground) and other sources of electricity. These OSHA standards can be found in:

- 29 CFR 1926, Subpart K – Electrical.
- 29 CFR 1926, Subpart L – Scaffolds.
- 29 CFR 1926, Subpart N – Cranes, Derricks, Hoists, Elevators, & Conveyors.
- 29 CFR 1926, Subpart O – Motor Vehicles, Mechanized Equipment, and Marine Operations.
- 29 CFR 1926, Subpart P - Excavations

These are federal laws and must be followed unless work is being performed in a state that has its own laws for the working around overhead and underground power lines. These federal standards set by OSHA provide the *minimum* level of acceptable safety, for a complete understanding of safe operations while working around power lines, other industry consensus standards and manufacturer's operators' manuals should be reviewed.

Chapter 2 – Taking Action to Prevent Power Line Contacts

Key concepts to be discussed within this chapter include:

1. OSHA's power line clearance distance.
2. American National Standards Institute (ANSI)
3. Safe working clearance distance about power lines.
4. Preventative measures that contractors can take to eliminate or reduce the hazard of a power line contact.
5. Planning for power line hazards.
6. Preventing underground power line contacts.

2.1 OSHA's Power Line Clearance Distance

The power line clearance distance is the closest distance that any equipment or material can get to an overhead power line.

2.1(a) Equipment in Operation

Working around or near electrical power lines is one of the most dangerous practices for crane operations. The OSHA requirements limit crane operations to a minimum clearance of 10 feet for lines rated at 50 kilovolts (kV) or less and for lines rated over 50 kV use the following formula:

10 feet + (.4 inches)(# of kV over 50 kV) = Line Clearance Distance

In order to use the formula, a contractor must know the exact voltage of a power line to calculate line clearance distance. Calling the utility company that owns the line can do this.

2.1(b) Equipment in Transit

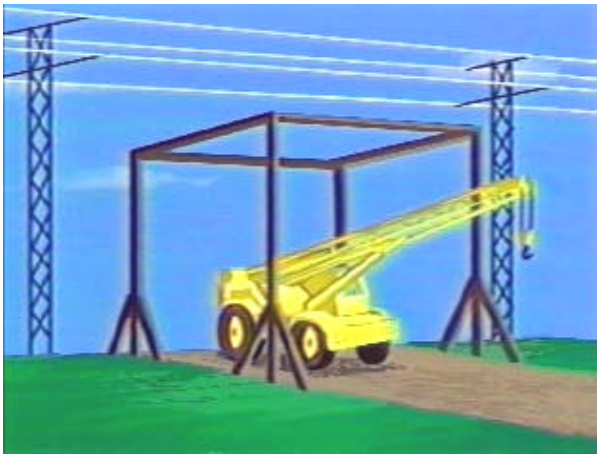
When a piece of equipment is in transit with no load and the boom lowered, the equipment clearance shall be a minimum of 4 feet for voltages less than 50 kV, and 10 feet for voltages over 50kV, up to and including 345 kV, and 16 feet for voltages up to and including 750 kV.

Power Line Clearance: Equipment in Transit	
Power Line kV	**Clearance**
0 to 50 kV	4 feet
50 kV to 345 kV	10 feet
345 kV to 750 kV	16 feet

Note: *1 kV equals 1,000 volts.*

Goal/Rider Posts

On many construction sites, power lines cross over temporary and permanent roads. Even though work may not be done around these lines, contacts can occur as equipment passes under them. To address this problem, use physical barriers called “goal/rider posts”. This type of barrier requires equipment operators to lower their equipment below a physical barrier placed under the power line.



2.2 American National Standards Institute (ANSI)

The American National Standards Institute (ANSI) is a private, not for profit organization whose mission is to enhance the quality of life by promoting the development of consensus standards. These consensus standards are important resources for ensuring safety on the jobsite. One ANSI Standard in particular relates to the proper operation of mobile cranes while in the vicinity of overhead power lines. ASME/ANSI B30.5 – Mobile and Locomotive Cranes; contains information on the characteristics and operations of cranes as well as the inspection, testing, and maintenance requirements.

These ANSI requirements for working around power lines are much more specific and inclusive than the federal requirements from OSHA. The ANSI requirements are:

1. A crane must not be used to handle material stored under power lines unless the crane cannot reach the *danger zone,* which is the minimum clearance specified in ASME B30.5-1995 (see figure 1).

2. Any overhead wire must be considered energized unless the owner or electric utility says it is not.

3. Crane operators must not rely on coverings (insulation) for protection.

4. The preferred safety procedure is to de-energize and ground the lines near the worksite.

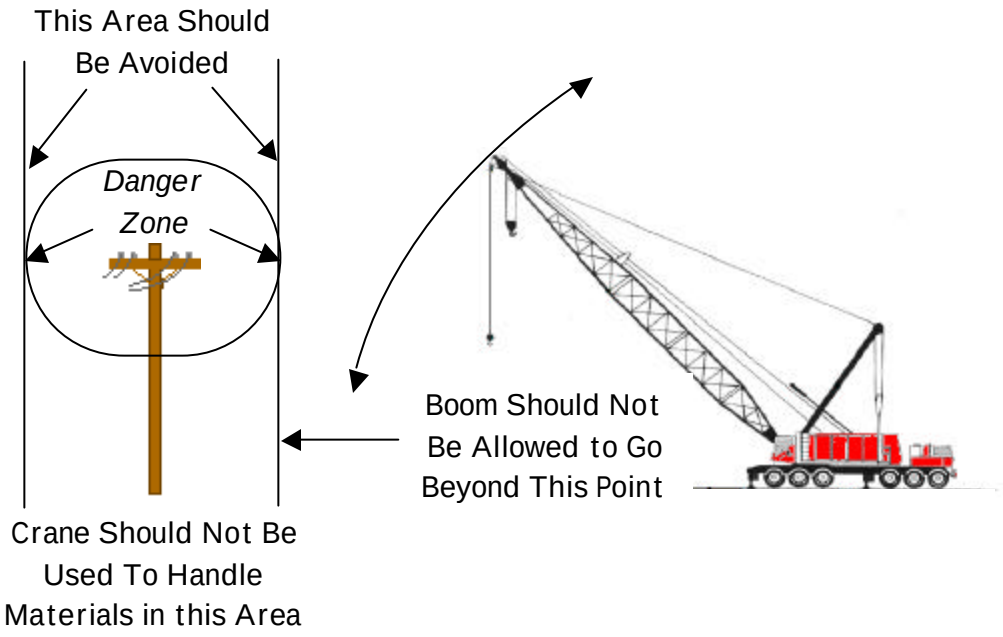
5. A sign warning of the hazards of power lines must be posted on the crane.

6. If the crane or load can reach the danger zone, a meeting must be held onsite with the utility to establish safety procedures. This must be done before work begins.

7. For load control, nonconductive tag lines should be used around power lines.

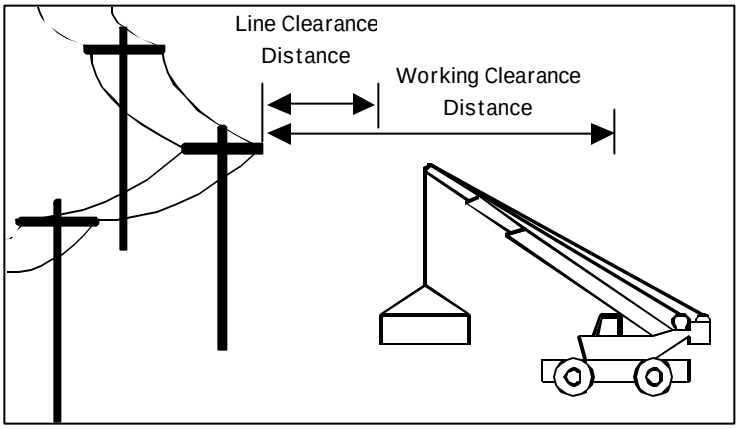
8. A qualified signalperson (or watchperson) must be appointed to maintain clearance and warn the operator. This is his or her sole duty.

Figure 1



2.3 Safe Working Clearance Distance

The line clearance formula only computes the line clearance distance. It doesn't determine the safe working clearance – the closest distance that you can place a piece of equipment without crossing into the power line's buffer zone. The safe working clearance is determined by adding a crane's furthest reach (considering the extension of any load) to the known *Line Clearance Distance*. For example, a crane with a 100-foot boom and a load that extends 10 feet beyond is working around a power line that requires a line clearance distance of 10 feet; place the crane 120 feet from the power line. If this situation is possible, the threat of a power line contact is eliminated.



2.4 Other Preventive Measures

If the equipment is being used closer than the safe working clearance distance allows, there are several options a contractor can choose. However, under no circumstance can any equipment or worker be closer than OSHA's line clearance distance (usually 10 feet) unless the utility has de-energized, visibly grounded the power lines, and informed the contractor that the lines are no longer dangerous. To prevent power line contacts, contractors can:

a) Have utility de-energize and visibly ground power lines.

b) Have utility move power lines beyond the safe working distance. *

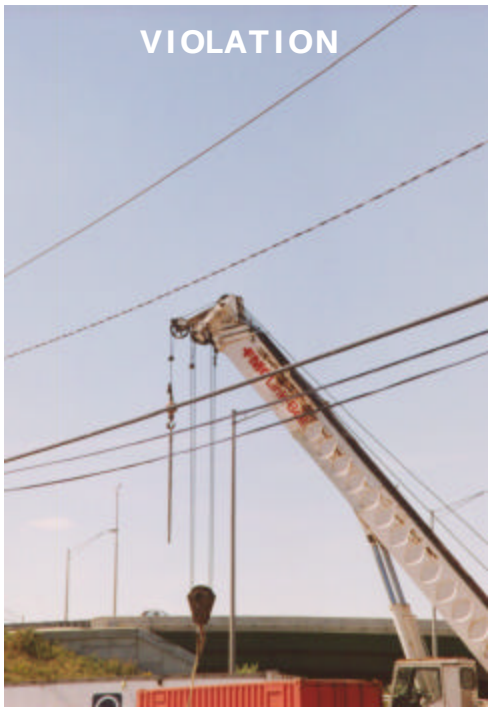
c) Use barrier protection. *

d) Install flagged warning lines to mark horizontal and vertical power line clearance distances. *

e) Utilize an observer. *

f) Install protective technologies on the material handling equipment. *

* *These preventative measures **do not** allow a contractor to work closer than the established line clearance distance.*

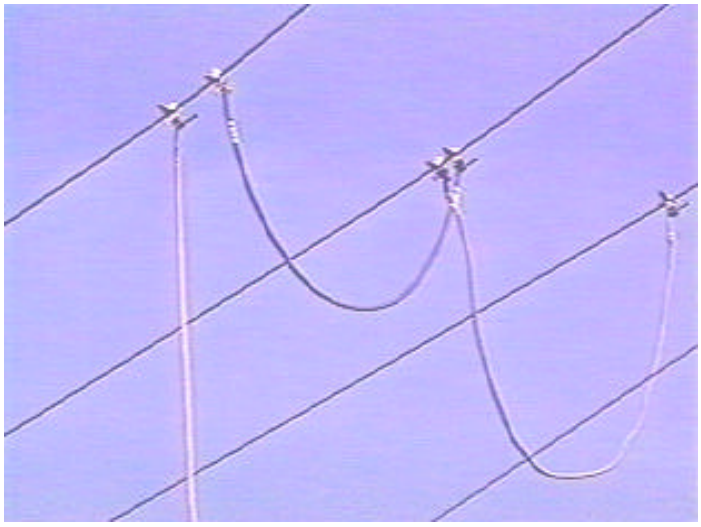


Here a mobile crane is operating dangerously close to an overhead power line. The picture shows no evidence of the lines being de-energized and visibly grounded, nor is any barrier protection installed to prevent physical contact.

Cranes contacting overhead power lines account for a significant number of electrocutions in the construction industry.

2.4(a) De-energizing and Visibly Grounding Power Lines

De-energizing and visibly grounding the line should be the first option considered for protecting workers. By eliminating the source of the electrocution hazard, the danger is eliminated. There is one important point to keep in mind with this option. Only power company personnel can de-energize a power line. The contractor must ask the local utility to de-energize it. The utility may need several weeks to comply with your company's request, so the work should be appropriately planned.



When power lines are de-energized, they must also be visibly grounded. To be sure that the lines are grounded, look for bonding cables connecting the power lines together. Two sets of bonding cables must be present, one set on each side that the crane will be working.

2.4(b) Moving the Line

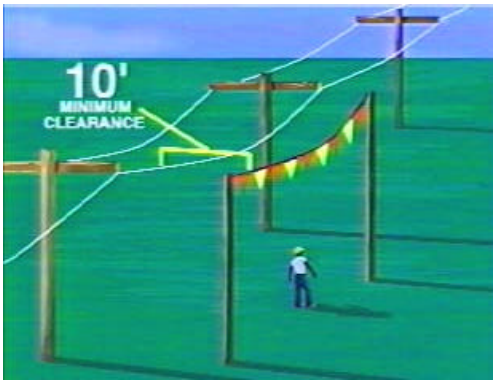
Moving the line beyond the safe working clearance distance will reduce the hazard for the work crews near the line. However, like de-energizing the line, only power company personnel can move a power line. Only the utility that owns the line can move it. Again, the utility may need several weeks to comply with the request, so work should be planned appropriately.

2.4(c) Barrier Protection

Another option that contractors may use is barrier protection. The most common type of barrier is the insulated sleeve that is attached directly to the power line.

If insulated sleeves are used, power company personnel can only install them and they must be appropriate for the type of work being performed. Workers have been electrocuted when insulating sleeves have failed and the equipment they were working with became electrified. So, never work closer than the line clearance distance.

2.4(d) Warning Lines with Flags



Using warning lines with flags is a way to visibly show where a power line's buffer zone is located. This option requires the installation of flagged warning lines to the side and below the power line. The warning line must be made of non-conductive materials. The warning line must never be attached to the utility line or pole.

Warning Spheres

Another device used to help operators know the location of overhead power lines are warning spheres that are placed directly onto the line. Only the utility company is allowed to install these spheres and adequate time must be given for this to happen. Remember, any warning system doesn't allow work any closer than the line clearance distance.

2.4(e) Using an Observer

The designated observer is assigned to monitor the distance between the high-reaching equipment and the power line. If the equipment nears the power line's clearance distance, the observer warns the equipment operator. For this to work, the observer must be able to accurately judge the distance between an energized power line and the high-reaching equipment. This is very difficult because of limited visual perception.

2.4(f) Protective Technologies

Protective technologies available for high-reaching equipment are limited in use and application. Most are designed for cranes, though some may be used on other high-reaching equipment.

Available technologies include:

- Proximity indicators
- Insulating links

Proximity Indicator

Proximity indicators are designed to warn the crane operator when any part of the boom is moved too close to an overhead line. All power sources emit an electromagnetic field that can be detected. A proximity indicator can be calibrated at a certain distance from the power line, and when the equipment breeches the electromagnetic field, an audible alarm will sound warning the operator. When using proximity indicators, the operator may not work closer to the power line than the allowed line clearance distance.

Insulating Links

Load Insulator® from InsulatUS, Inc.

Insulating links are used between the crane hook and the load. They are insulated linkages that connect the load line to the crane's lifting hook. If a power line contact occurs, the linkage is designed to prevent electricity from passing to the load. The entire structure of the crane, however, is not protected and will remain energized. Therefore, it is possible for the rigger to be protected, but any worker near the crane body could be electrocuted from current passing through the ground. The operator can also be electrocuted when stepping down from the equipment. It's important that links are regularly inspected and properly maintained to avoid premature failure. An insulated link does not allow an operator to work closer to the power line than the established line clearance distance.

2.5 Planning for Power Line Hazards

A written plan will help to eliminate inadvertent power line contacts. Before work begins, a contractor must determine the location of all power lines and analyze the jobsite for possible electrical hazards. The plan should address the following:

1. The power line hazards on the jobsite.
2. Methods to eliminate or control those hazards.
3. Worker training (content and verification).
4. Assignment of responsibility for certain activities (e.g. observer for crane near line).
5. Communication between contractors about power line hazards and control methods used on the jobsite.
6. Emergency response.

To help plan for and eliminate power line contacts, follow this process:

- **Survey;** locate all power lines on the job site.
- **Identify;** determine which activities and equipment will be at risk of contacting a power line.
- **Eliminate;** by having the utility companies de-energize and visibly ground the line, or by having the power line moved a safe distance away from the work would ensure that an inadvertent contact would not occur.
- **Control;** if the power line cannot be de-energized or moved, then take precautionary measures and have a written plan.

2.6 Preventing Underground Power Lines Contacts

Buried power lines, regardless of voltage, present a different kind of hazard to construction workers than overhead power lines. When injuries from underground power lines occur, they're most frequently received by those operating powered hand tools or in contact with digging machinery.

Call Before You Dig!

Every utility company is required to belong to a "Local One-Call" system that is specific to the State where the utility is located. A utility company not belonging to the one-call system or failure for a contractor to call the system for locates could bring thousands of dollars in fines. As for contractors who cannot provide proof that a call was made, all repairs and other damages are of the responsibility of the contractor.

In most States, a contractor must notify the one-call system at least 48 hours in advance. The ultimate responsibility for any damage underground utility rests with the contractor performing the work. If you have a suspicion, even after the locations of buried utilities have been determined, hand dig with extreme care. Many cables are buried side by side. If, after finding an underground cable, you're still unsure about the presence of additional cables continue to hand dig.

Chapter 3 – Dealing with Power Line Emergencies

Key concepts to be discussed within this chapter include:

1. The effects of electricity on equipment.
2. Procedures to follow in the event of an electrical strike.

3.1 Effects of Electricity

In the unlikely event that a power line contact does occur, the response of those on or around the equipment is critical. Everyone working with and around cranes should be aware of the actions to be taken in the unlikely event that a power line is contacted.

If a power line contact occurs, the operator should stay on the equipment. Don't leave unless there is an extreme emergency.

Power line contacts involving equipment such as mobile cranes generally don't result in injuries to the equipment operator. Injuries and death are usually suffered by the rigger(s) or other workers standing near the equipment. The reason for fewer injuries to operators is equipment design. If a contact occurs, the operator is at the same electrical potential as the equipment. With a boom-truck, however, the operator is usually in contact with the ground and receives the shock as current seeks its path to the ground.

When a mobile crane contacts a power line, the rigger or ground crews are most likely to be affected. The operator sitting in the cab is at the same electrical potential as the equipment.

When a boom truck contacts a power line, the operator, who is usually standing on the ground, is most likely to be affected. Any other worker who may be standing near the equipment will also be affected.

3.2 Procedures to Follow If Contact Occurs

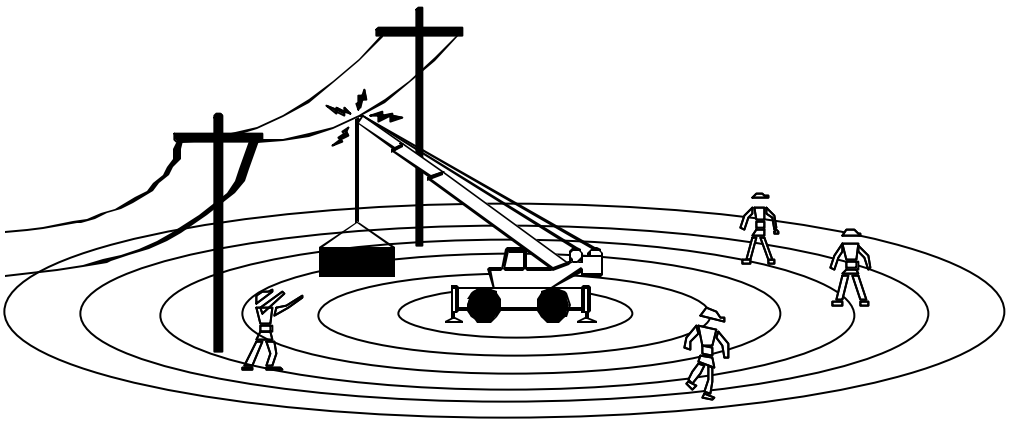
To protect against electrical shock injury in the event of contact between a crane and an energized line, remember the following:

1. The crane operator should remain inside the cab.
2. All other personnel should keep away from the crane, ropes, and load, since the ground around the machine might be energized.
3. The crane operator should try to remove the crane from contact by moving it in the reverse direction from that which caused the contact.
4. If the crane cannot be moved away from contact, the operator should remain inside cab until the lines have been de-energized.
5. If the crane operator must leave the equipment because of a more immediate hazard, then this person must jump clear from the equipment and shuffle their feet in small steps.
6. Secure the area and do not let anyone except emergency rescue personnel go near the energized equipment.

Everyone around the crane must be very careful to not touch any part of the equipment and the ground at the same time. If this contact is made, an electrocution injury can result.

> If you must leave the equipment:
>
> 1. Jump from the equipment.
> 2. Shuffle your feet with very small steps.

If an operator must leave the equipment, or a worker needs to get away from an energized crane, shuffle your feet in very small steps. After a power line contact, the current flows outward through the ground in a ripple pattern. Areas of high and low electrical potential fields circle the energized equipment like ripples in a pond after a stone hits the surface. If a worker steps from an area of high electrical potential to an area of low electrical potential, electricity can flow through their legs causing injury or death.



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

Remember, the power flowing through the ground could easily injure and kill you. Then, instead of one victim, there will be two, or three. No matter what you think or feel, you can't go near the energized worker until you know the power is off. Remember, you can't be sure that the power is off just by looking at the victim or power line. Rely only on emergency medical rescue professionals and/or utility company personnel to assist with a rescue.

Today's Date _____ **Job Number** _____

Contractor Name			
Job Address			
Telephone Number		**Fax Number**	

Emergency Contact Number	

Survey

Before beginning any project, you must first survey your work area to find power lines at the job site. (See job site sketch on reverse side) Call for underground locate.

Identify

After finding all of the power lines at your site, identify the activities you'll be doing that may put you or your workers at risk. Mark one or more of the following:

[ ] Cranes (mobile or truck mounted)
[ ] Drilling rigs
[ ] Backhoes/Excavators
[ ] Long-handled tools
[ ] Other tools/high-reaching equipment
[ ] Concrete pumper
[ ] Aerial lifts
[ ] Dump trucks
[ ] Ladders
[ ] Material Handling & Storage
[ ] Scaffolding
[ ] Other_____

Eliminate or Control

After identifying the power line and high-risk activities on our job site, we must determine how to eliminate or control the risk of electrocution (a successful determination is often reached only after consultation with the utility). Mark one or more of the following:

[ ] Move the activity
[ ] Change the activity
[ ] Have the utility de-energize power line
[ ] Have the utility move the power line
[ ] Use barrier protection (insulated sleeves)
[ ] Use an observer
[ ] Use warning lines with flags
[ ] Use non-conductive tools
[ ] Use a protective technology (list):_____

Always maintain your minimum safe clearance distance from the power line, except when the utility has de-energized and visibly grounded the power line.

Voltages	**Distance from Power Line**
Less than 50 kV	10 Feet
More than 50 kV	*10'+(0.4")(# of kV over 50 kV)*

WARNING!

It is unlawful to operate any piece of equipment within 10' of energized lines

Jobsite sketch

(Draw in location of power lines and their proximity to construction site, include such things as; proposed excavations, location of heavy equipment, scaffolding, material storage areas, etc.)

Completed by_____***Date***_____

Title_____

Approved by_____***Date***_____

Title_____