

Welcome

Safety of Equipment around Power Lines

Presented by:
Paul A. Satti, M.S., CHST
Technical Director, Construction Safety Council

Power lines are lethal weapons. And while equipment operators are responsible for keeping themselves safe from overhead dangers, it’s only through employer commitment and dedicated job-site supervision that the hazards of power lines can be properly managed. This session will outline the responsibilities and competencies in power line safety and explain OSHA’s power line safety rule, 29 CFR 1926 Subpart CC.

Learning Objectives:

- Identify OSHA’s power line safety standards, specifically clearance distances for both known and unknown voltages.
- List the options for compliance if working in close proximity to an overhead power line.
- Prepare planning documentation that complies with OSHA’s encroachment/electrocution prevention requirements to include the procedures to be followed in the event of a power line contact.

This publication contains:

1. The purpose for the Occupational Safety and Health Administration (OSHA) and its enforcement duty under law.
2. Important terms and definitions that apply to the safe set-up, use and inspection of mobile cranes and rigging used in construction.
3. Mobile crane safety management system for contractors.
4. Power Line Hazards Awareness.
Acknowledgements

- Occupational Safety & Health Administration (OSHA)
- International Union of Operating Engineers Local 150
- Paul A. Satti, M.S., CHST

GENERAL DISCLAIMER

This material is not a substitute for any provision of the Occupational Safety and Health Administration (OSHA) or any standards issued by OSHA. If at any time it is discovered that the materials presented vary from Federal or State OSHA regulations, American National Standards Institute (ANSI), American Society of Mechanical Engineers (ASME), EPA regulations, state laws or local ordinances, it is understood that those regulations, laws and ordinances will take precedence over the materials presented herein. In some cases, the information given may imply a higher level of protection than required in some Federal or State OSHA regulations. The mention of any products or materials by brand name in no way constitutes endorsement. Any products or materials not mentioned within this manual that may be considered acceptable as protective devices, equipment, or practices is not intentional and should not rule out their acceptability as employee or environmental protection.

Finally, this guide is intended to be used as a training aid and for general information only so as to illustrate the concepts and design of a mobile crane management system; the creator assumes no responsibility for any loss or damage resulting from its use.
Reasons for Development

- Protect the safety and health of the worker.
- Protect the investments of the employer.
- Train competent persons to perform frequent and regular inspections of the job-site, materials and equipment.
- Help employers understand and react to mobile crane hazards in construction and comply with Federal rules and regulations.

OSHA Standards... §1926.20 General Safety & Health Provisions

(b) Accident Prevention Responsibilities

(1) It shall be the responsibility of the employer to initiate and maintain such programs as may be necessary to comply with [OSHA standards].

(2) Such programs shall provide for frequent and regular inspections of the job-sites, materials, and equipment to be made by competent persons designated by the employers.

(3) The use of any machinery, tool, material, or equipment which is not in compliance with any applicable requirement of [OSHA] is prohibited. Such machine, tool, material, or equipment shall either be identified as unsafe by tagging or locking the controls to render them inoperable or shall be physically removed from its place of operation.

(4) The employer shall permit only those employees qualified by training or experience to operate equipment and machinery.

OSHA Standards... §1926.21 Safety Training & Education

(b) Employer Responsibility

(1) The employer should avail himself of the safety and health training programs the Secretary provides.

(2) The employer shall instruct each employee in the recognition and avoidance of unsafe conditions and the regulations applicable to his work environment.
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Discussion Points

- Components of a Mobile Crane Management System.
- Mobile crane types.
- OSHA’s General Duty Clause
- Employer/employee rights & responsibilities under the OSHAct.
- OSHA’s Multi-Employer Worksite Citation Policy.
- OSHA’s Federal Crane Standards (29 CFR 1926, Subpart CC).
- Industry Consensus Standards for mobile cranes & rigging (ASME).
- Important Terms & Definitions within OSHA’s Federal crane standards.

Important Terms & Definitions

- Mobile Crane Management System
- General Duty Clause
- OSHAct
- Multi-Employer Worksite Citation Policy
- Creating Employer
- Exposing Employer
- Correcting Employer
- Controlling Employer
- Federal Crane Standards (29 CFR 1926, Subpart CC)
- Industry Consensus Standards
- American Society of Mechanical Engineers (ASME)
- A/D Director (Assembly/Disassembly Director)
- Competent Person
- Qualified Person
- Controlling Entity
Introduction to Mobile Crane Hazards

One of the most productive and certainly most expensive pieces of equipment on any construction jobsite is the crane. A job’s schedule can be completely dependent upon this one piece of equipment, and the crane operator can influence the attitudes of every trade on site. Since cranes affect a large segment of work at any construction site, proper crane management is essential to prevent a catastrophic accident. Statistics indicate that a significant number of injuries and fatalities are crane related accidents that also cost hundreds of thousands of dollars in equipment damage and other related costs.

This manual provides an explanation of Federal crane standards as well as provides industry best practices which have been proven to make up a Mobile Crane Management System.

**Mobile Crane Management System**

An employer’s Mobile Crane Management System includes:

- Knowledge of OSHA Standards (29 CFR 1926 Subpart CC)
- Knowledge of Industry Consensus Standards
- Mobile Crane Management Policy & Accountability Plan
- General Crane Inspection Criteria
- Job-site Ground Conditions Inspection Check-list
- Assembly/Disassembly Plan & Procedures
- Job-site Specific Lift Plan
- Rigging Inspection Criteria and Inspection Records
- Power Line Safety & Pre-lift Meeting Documentation
- Personnel Qualification Requirements and Training
  - Operator
  - Rigger
  - Signal Person

**NOTE:** Federal Crane standards apply to all types of equipment that can hoist, lower and horizontally move a suspended load, including, tower cranes, overhead cranes, derricks and other equipment that can be adapted to hoist a load. This manual will focus on mobile crane requirements only; however, some of the practices described herein can be applied to all types of equipment (i.e., excavators, backhoes, concrete pumps, etc...).
**Introduction to Mobile Crane Hazards**

**Mobile Crane Types**
There are several types of mobile cranes recognized by the U.S. Department of Labor’s Occupational Safety & Health Administration (OSHA) and the American Society of Mechanical Engineers (ASME). The most common types of mobile cranes used in construction are illustrated here.

**Boom Trucks**
These cranes are mounted on a commercial truck chassis that has been specially strengthened to accept the crane. They are a type of mobile crane with the respectable capacity and boom length. Boom trucks come in two basic types: telescoping (extensible) boom and knuckle (articulating) boom.

**Rough Terrain Cranes**
The rough terrain crane’s oversized tiers facilitate movement across the rough terrain of construction sites and other broken ground. Their short wheel base and crab-steering improve maneuverability. They come in two basic configurations: fixed cab and rotating cab equipped with either full power booms or pinned booms and jib extensions. In “pick and carry” operations, rough terrain cranes are subject to the same operating restrictions that apply to other cranes.
**Carrier or Truck Mounted Cranes (Lattice or Telescopic Boom)**

This “truck type” carrier must not be confused with the ordinary commercial truck chassis. These cranes have specially designed carriers for crane service and the heavy loads they are required to withstand. They can be equipped with a variety of jibs and boom extensions which can be stowed on or under the heel section of the main boom.

**Crawler-Mounted Cranes (Lattice or Telescoping Boom)**

The upperworks of these cranes are identical to the carrier-mounted cranes. Their bases, and the method used to load rate them, differ. They have no outriggers to form their support base. The crawler unit provides the support base for the crane and incorporates a continuous belt of sprocket driven track.

**Sideboom Cranes**

A track-type or wheel-type tractor having a boom mounted on the side of the tractor, used for lifting, lowering or transporting a load suspended on the load hook. The boom or hook can be lifted or lowered in a vertical direction only.
Introduction to OSHA

Occupational Safety & Health Administration (OSHA)

OSHA’s Purpose...
To assure safe and healthful working conditions for working men and women; by authorizing enforcement of the standards developed under the Act; by assisting and encouraging the States in their efforts to assure safe and healthful working conditions; by providing for research, information, education, and training in the field of occupational safety and health; and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, that this Act may be cited as the “Occupational Safety and Health Act of 1970” (OSHAct).

General Duty Clause...
(a) Each employer
   (1) Shall furnish to each of his employees employment and a place of employment which are free from recognized hazards that are causing or are likely to cause death or serious physical harm to his employees.
   (2) Shall comply with occupational safety and health standards promulgated under this Act.

(b) Each employee shall comply with occupational safety and health standards and all rules, regulations, and orders issued pursuant to this Act which are applicable to his own actions and conduct.

What is OSHA’s General Duty Clause?
Section 5(a)(1) of the OSHAct has become known as “The General Duty Clause”. It is a catch all for citations if OSHA identifies unsafe conditions to which a regulation does not exist.

In practice, OSHA, court precedent, and the review commission have established that if the following elements are present, a “general duty clause” citation may be issued.

1. An employer failed to keep the workplace free of a hazard to which employees of that employer were exposed.
2. The hazard was recognized. (Examples might include: through job-site safety personnel, employees, trade unions and other associations/organizations.)
3. The hazard was causing or was likely to cause death or serious physical harm.
4. There was a feasible and useful method to correct the hazard.
EMployees:

- You have the right to notify your employer or OSHA about workplace hazards. You may ask OSHA to keep your name confidential.

- You have the right to request an OSHA inspection if you believe that there are unsafe and unhealthful conditions in your workplace. You or your representative may participate in that inspection.

- You can file a complaint with OSHA within 30 days of retaliation or discrimination by your employer for making safety and health complaints or for exercising your rights under the OSH Act.

- You have a right to see OSHA citations issued to your employer. Your employer must post the citations at or near the place of the alleged violation.

- Your employer must correct workplace hazards by the date indicated on the citation and must certify that these hazards have been reduced or eliminated.

- You have the right to copies of your medical records or records of your exposure to toxic and harmful substances or conditions.

- Your employer must post this notice (OSHA 3165-12-06R) in your workplace.

- You must comply with all occupational safety and health standards issued under the OSH Act that apply to your own actions and conduct on the job.

Employers:

- You must furnish your employees a place of employment free from recognized hazards.

- You must comply with the occupational safety and health standards issued under the OSH Act.

This free poster available from OSHA - the Best Resource for Safety and Health

Free assistance in identifying and correcting hazards or complying with standards is available to employers, without citation or penalty, through OSHA-supported consultation programs in each state.

1-800-321-OSHA
www.osha.gov

OSHA 3165-12-06R
Refusing to Work because Conditions are Dangerous

Workers have the right to refuse to do a job if they believe in good faith that they are exposed to an imminent danger. “Good faith” means that even if an imminent danger is not found to exist, the worker had reasonable grounds to believe that it did exist.

Refusing work is protected if...

Your right to refuse to do a task is protected if all of the following conditions are met:

☐ Where possible, you have asked the employer to eliminate the danger, and the employer failed to do so; and

☐ You refused to work in “good faith.” This means that you must genuinely believe that an imminent danger exists. Your refusal cannot be a disguised attempt to harass your employer or disrupt business; and

☐ A reasonable person would agree that there is a real danger of death or serious injury (illness); and

☐ There isn’t enough time, due to the urgency of the hazard, to get it corrected through regular enforcement channels, such as requesting an OSHA inspection.

When all of these conditions are met, you take the following steps:

☐ Ask your employer to correct the hazard;

☐ Ask your employer for other work;

☐ Tell your employer that you won’t perform the work unless and until the hazard is corrected; and

☐ Remain at the worksite until ordered to leave by your employer.

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<td>You believe working conditions are unsafe or unhealthful.</td>
<td>Call your employer’s attention to the problem.</td>
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<td>Your employer does not correct the hazard or disagrees with you about the extent of the hazard.</td>
<td>You may file a complaint with OSHA.</td>
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<tr>
<td>Your employer discriminates against you for refusing to perform the dangerous work.</td>
<td>Contact OSHA immediately.</td>
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(800) 321-OSHA
OSHA’s Multi-Employer Worksite Citation Policy

When a mobile crane is operated on a construction jobsite, it usually involves the efforts of multiple employers. Because of this “multi-employer” relationship, more than one employer may be citable for a hazardous condition that violates an OSHA standard.

OSHA classifies employers into one or more of four categories – the creating, exposing, correcting, and controlling employers – to determine if a citation will be issued.

The Creating Employer: an employer who causes a hazardous condition that violates an OSHA standard. An employer who creates the hazard is citable even if the only employees exposed in the workplace are those who work for other employers.

The Exposing Employer: an employer whose own employees are exposed to the hazard.

If the exposing employer created the violation, he/she is citable for the violation as a creating employer.

If the violation was created by another employer, the exposing employer is citable if he/she:

1) Knew of the hazardous condition or failed to exercise reasonable diligence to discover the condition, and
2) Failed to take steps to protect his/her employees.

If the exposing employer has the authority to correct the hazard, he/she must do so.

If he/she lacks the authority to correct the hazard, he/she is citable if he/she fails to do each of the following:

1) Ask the creating and/or controlling employer to correct the hazard
2) Inform his/her employees of the hazard, and
3) Take reasonable alternative protective measures.

NOTE: In some circumstances, the employer is citable for failing to remove his/her employees from the job to avoid the hazard.

The Correcting Employer: an employer who is responsible for correcting a hazard on the exposing employer’s worksite, usually occurring while the correcting employer is installing and/or maintaining safety/health equipment. The correcting employer must exercise reasonable care in preventing and discovering violations and meet his/her obligation of correcting the hazard.

The Controlling Employer: an employer who has general supervisory authority over the worksite, including the power to correct safety and health violations or requiring others to correct them. A controlling employer must exercise reasonable care to prevent and detect violations on the site.
**Final Rule**

Employers who operate cranes on a construction job-site are responsible for complying with Federal rules & regulations, as well as be familiar with applicable state and local codes and other industry consensus standards. The Code of Federal Regulations addressing the use of cranes is published at 29 CFR 1926.1400 - .1442 (Subpart CC). Equipment owners, operators, riggers, signal persons and job-site supervision have responsibilities under this OSHA rule (Occupational Safety & Health Administration).

*NOTE:* An employer is required to become familiar with the OSHA crane rule and any other applicable standards that may apply. Go to www.osha.gov for a complete listing of OSHA crane and other related standards.

Federal crane standards comprehensively address key hazards related to cranes and derricks on construction worksites, including the four main causes of worker death and injury: *electrocution, crushed by parts of the equipment, struck-by the equipment/load, and falls.*

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**The Federal crane standard requires:**

- Most operators to be formally qualified or certified.
- Employers, including crane users and controlling contractors, ensure that ground conditions are adequate to safely support the equipment.
- Workers to be protected during assembly and disassembly from being struck or crushed by unanticipated movement of crane components, as well as require equipment to be properly assembled.
- Sufficient clearance distances from power lines hazards.
- The use of qualified riggers for all hoisting and rigging operations.
- Fall protection to be used in certain situations.
Know this...

➤ If you own and operate a crane on a construction site, and the crane operator is your employee, you must comply with all requirements of the standard (Subpart CC), as you control all hazards the crane may create.

➤ If you operate a leased crane on a construction site, and the crane lessor has informed you that the crane meets OSHA standards, you must still take steps to verify that claim; ask the lessor for the most recent monthly and annual inspections reports, which will identify any problems found by the inspectors that either needed to be fixed or that need to be checked in future inspections.

### 29 CFR 1926 Subpart CC – Cranes & Derricks in Construction

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**NOTE:** This training guide excludes some information on tower cranes, derricks, floating cranes/derricks and land cranes/derricks on barges, overhead & gantry cranes, dedicated pile drivers, sideboom cranes and equipment with a rated hoisting/lifting capacity of 2,000 lbs. or less. Consult OSHA standards 29 CFR 1926 Subpart CC for complete listing of crane regulations.
### 29 CFR 1926 Subpart CC (.1400 – .1442)

**List of Sections**

| §1926.1400 | Scope – 29 CFR 1926 Subpart CC, page 13. | §1926.1420 | Signals – radio, telephone or other electronic transmission of signals |
| §1926.1402 | Ground Conditions, page 19. | §1926.1422 | Signals – hand signal chart |
| §1926.1403 | Assembly/Disassembly – selection of manufacturer or employer procedures | §1926.1423 | Fall Protection |
| §1926.1404 | Assembly/Disassembly – general requirements | §1926.1424 | Work Area Control |
| §1926.1405 | Disassembly – additional requirements for dismantling of booms and jibs | §1926.1425 | Keeping Clear of Load |
| §1926.1406 | Assembly/Disassembly – employer procedures – general requirements | §1926.1426 | Free Fall and Controlled Load Lowering |
| §1926.1407 | Power Line Safety (up to 350 kV) – assembly and disassembly | §1926.1427 | Operator Qualification and Certification |
| §1926.1408 | Power Line Safety (up to 350 kV) – equipment operations | §1926.1428 | Signal Person Qualifications |
| §1926.1409 | Power Line Safety (over 350 kV) | §1926.1429 | Qualifications of Maintenance & Repair Employees |
| §1926.1410 | Power Line Safety (all voltages) – equipment operations closer than the Table A zone | §1926.1430 | Training |
| §1926.1411 | Power Line Safety – while traveling under or near power lines with no load | §1926.1431 | Hoisting Personnel |
| §1926.1412 | Inspection (Crane) | §1926.1432 | Multiple-Crane/Derrick Lifts – supplemental requirements |
| §1926.1413 | Wire Rope – inspection | §1926.1433 | Design, Construction and Testing |
| §1926.1414 | Wire Rope – selection and installation criteria | §1926.1434 | Equipment Modifications |
| §1926.1415 | Safety Devices | §1926.1435 | Tower Cranes |
| §1926.1416 | Operational Aids | §1926.1436 | Derricks |
| §1926.1417 | Operation | §1926.1437 | Floating Cranes/Derricks and Land Cranes/Derricks on Barges |
| §1926.1418 | Authority to Stop Operation | §1926.1438 | Overhead & Gantry Cranes |
| §1926.1419 | Signals – general requirements | §1926.1439 | Dedicated Pile Drivers |
| | | §1926.1440 | Sideboom Cranes |
| | | §1926.1441 | Equipment with a Rated Hoisting/Lifting Capacity of 2,000 lbs. or Less |
| | | §1926.1442 | Severability |
American Society of Mechanical Engineer (ASME)

The ASME standard B30 Standard contains provisions that apply to the construction, installation, operation, inspection, testing, maintenance, and use of cranes and other lifting and material-handling related equipment. The standard has been divided into separate volumes. Each volume has been written under the direction of the ASME B30 Standards Committee and has successfully completed a consensus approval process under the general auspices of the American National Standards Institute (ANSI).

The B30 Standard comprises of a number of different volumes, the following volumes are of particular interest to construction (check for changes and updates regularly):

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The B30 Standards are intended to:

a) Prevent or minimize injury to workers, and otherwise provide for the protection of life, limb, and property by prescribing safety requirements.

b) Provide direction to manufacturers, owners, employers, users, and others concerned with or responsible for cranes.

c) Guide governments and other regulatory bodies in the development, promulgation, and enforcement of appropriate safety directives.
Employers who operate cranes on a construction site are responsible for complying with all aspects of the standard, but other employers whose personnel work at the site have responsibilities as well. These employer duties are consistent with OSHA's multi-employer policy, which recognizes that the Occupational Safety and Health Act imposes compliance duties on (1) employers who create or control hazards, (2) employers whose employees are exposed to hazards, and (3) employers with general supervisory authority over a worksite.

The following Questions and Answers explain the compliance duties of different employers under various common situations.

**Question 1:** I own and operate a crane on a construction site. The crane operator is my employee. What are my responsibilities under the standard?

**Answer 1:** You must comply with all requirements of the standard, as you control all hazards the crane may create.

**Question 2:** I operate a leased crane on a construction site. The crane's lessor has informed me that the crane meets OSHA's standard. Can I rely on the lessor's word and assume that the crane complies with the standard?

**Answer 2:** No. As the employer operating the crane you are responsible for complying with all requirements of the standard. Even if the lessor states that the crane meets the standard, you must take steps to verify that claim. One way to verify their claim is to ask the lessor for the most recent monthly and annual inspections reports, which will identify any problems found by the inspectors that either needed to be fixed or that need to be checked in future inspections. These documents must be made available to all persons who conduct inspections under the standard, including the shift inspections you must conduct while operating the crane. See Sections 1412(k) and 1413(e). If the lessor cannot produce the required inspection documents, you will need to conduct an annual inspection and document the results of that inspection before operating the crane. See Section 1412 for a description of the inspections required by the standard.

**Question 3:** I lease a crane to a construction contractor and provide an operator for the crane. While on the site, the operator is supervised exclusively by the lessee's foreman. Do I have any responsibilities under the standard?

**Answer 3:** Yes. You must comply with all requirements of the standard because your employee, the operator, would be exposed to any hazards resulting from the crane's operation. Moreover, you are responsible for any violations caused by the crane operator because you are the operator's employer and the lessee is relying on the operator's knowledge and skills to ensure that operations are conducted safely. See section 1427(a) (Operator qualification and certification).
Question 4: I lease a crane to a construction contractor. I do not provide an operator with the crane. However, when the lessee tells me that the crane requires maintenance or repair, I send my mechanic to do the necessary work. Do I have any responsibilities under the standard?

Answer 4: Yes. Because the mechanic is your employee, you must comply with section 1429 (Qualifications of maintenance and repair workers), and you are responsible for any hazards that result from the actions of your mechanic that expose other workers on the site to hazards. In addition, you are responsible for any violations to which your mechanic is exposed while he/she is working on the crane.

Question 5: I lease a crane to a construction contractor. I do not provide an operator for the crane, nor do I have anyone inspect or repair the crane while it is on the site. Do I have any responsibilities under the standard?

Answer 5: No. An employer who leases (or sells) a crane but does not send any employees to the worksite where the crane is used is not subject to the standard. However, as noted in Answer 2, the lessee is responsible for the condition of the crane and may ask you to produce written records of past crane inspections or to provide other information about the crane.

Question 6: I am a contractor on a construction site. Another contractor is using a crane on the site. None of my work involves the crane. Do I have any responsibilities under the standard?

Answer 6: Yes, because your employees may be exposed to hazards caused by the crane's operation. For example, if a crane collapses due to being overloaded, employees working elsewhere on the site can be killed or injured. And if, for example, a crane makes electrical contact with a power line, any employee touching or even near the crane can be electrocuted.

Even though you are not operating the crane, you must be aware of potential crane hazards and are responsible for protecting your employees against hazards you can reasonably foresee. You must take reasonable steps to protect your employees. For example, if you are concerned with a crane's stability due to potential overloading, unstable ground conditions, or high winds, you must satisfy yourself that the crane is stable before allowing your employees to work where they would be in danger if the crane collapses. One way is to ask the company operating the crane or the controlling contractor on the site whether all necessary precautions are being taken to ensure the crane's stability. Also, you have a duty to train your employees in the hazards associated with their work, including those that might arise from working near a crane.
Question 7: What training must I provide to my employees?

Answer 7: Training that must be provided under the standard to equipment operators, signal persons, competent and qualified persons, maintenance and repair workers, and workers who work near the equipment is referenced primarily in Section 1430. Additional training requirements are specified in other provisions of the standard. In addition, 1926.21(b)(2) requires employers to train construction workers how to recognize and avoid the hazards associated with their work and, depending on the circumstances, may require training in topics not listed in the cranes and derricks standard.

Question 8: I operate a lumberyard and deliver sheet goods (such as drywall or plywood) or packaged goods (such as roofing shingles, bags of cement, or rolls of roofing felt) to a construction site using a flatbed truck equipped with an articulating crane. At the site, I use the crane to place the material either onto the ground or onto the structure being erected. Must I comply with the standard?

Answer 8: If you only place materials on the ground without arranging the materials in a particular order for hoisting, you are not engaged in construction work and have no duties under the standard. If you place materials onto the structure, you are engaged in construction work, and the standard applies to your work. However, if you deliver only building supply sheet goods or building supply packaged materials onto the structure and your articulating/knuckleboom truck crane is equipped with a properly functioning automatic overload prevention device, you have no further duties under the standard. Otherwise, you must comply with the entire standard when using the crane to place material onto the structure.

Question 9: I deliver prefabricated roof trusses and wall panels to a construction site using a flatbed truck equipped with an articulating crane. At the site, I use the crane to place the material either onto the ground or onto the structure being erected. Must I comply with the standard?

Answer 9: You must comply with the standard if you unload the material onto the structure. You need not comply with the standard if you unload the material onto the ground without arranging the materials in a particular order for hoisting because that activity is not construction work.
Employer Responsibilities Q & A

Question 10: I am the general contractor on a homebuilding project. The framing subcontractor informs me that he will be bringing a crane onto the site to lift roof trusses onto the structure. Do I have any responsibilities under the standard?

Answer 10: You are responsible for seeing that the ground on which the crane will operate is sufficiently firm and level to enable the crane to operate safely. See Section 1402 (Ground conditions). In addition, you must inform the framing contractor of the location of hazards beneath the equipment set-up area (such as voids, tanks, utilities) if those hazards are identified in documents (such as site drawings, as-built drawings, or soil analyses) that are in your possession or the hazards are otherwise known to you. If there is more than one crane on the site and the working radii of the cranes overlap, you must establish a system to control their operations. See Section 1424(b). In addition to these specific duties under the standard, as the controlling contractor on the site you have the same responsibility under this standard as you have under other OSHA standards: you must exercise reasonable care to prevent and detect violations on the site. See OSHA Instruction CPL 2-0.124, "Multi-Employer Citation Policy," (Dec. 10, 1999), section X.E (available on OSHA’s website).

Question 11: I notice that certain provisions of the standard direct my employees, such as my crane operator, to take certain steps. Do I have any responsibilities under such provisions?

Answer 11: Yes. Where provisions of this standard direct an operator, crewmember, or other employee to take certain actions, Section 1400(f) requires you to establish, effectively communicate to the relevant persons, and enforce work rules to ensure compliance with such provisions.
**Discussion Points**

- Scope of OSHA’s Standard 29 CFR 1926 Subpart CC.
- Covered and excluded equipment.
- Special rules for articulating/knuckle-boom cranes.

**Covered and Excluded Equipment**

The OSHA rule applies to power-operated equipment used in construction work that can hoist, lower and horizontally move a suspended load, unless such equipment is specifically excluded from coverage.

**NOTE:** OSHA lists in its standards specific types of equipment that are covered and specific types that are excluded from coverage.

**Covered Equipment**

- Mobile cranes, including crawler mounted, wheel-mounted, rough terrain, all-terrain, commercial truck-mounted, and boom truck cranes.
- Tower cranes, including those with a fixed jib (i.e., "hammerhead boom") those with a luffing boom and self-erecting tower cranes.
- Articulating cranes, such as knuckle-boom cranes. (See page 20 for rules that apply when such cranes are used to deliver material to a construction site).
- All derricks, except for gin poles used for the erection of communication towers. (Note that, despite their name, "digger derricks" are not "derricks" under the standard. As noted, the standard applies to "digger derricks" unless they are used for certain work).
- Equipment that is covered under the standard continues to be covered when used with crane-attached or crane-suspended attachments, i.e., magnets, grapples, buckets, etc...

**OSHA Definition:**

*Hoist* means a mechanical device for lifting and lowering loads by winding a line onto or off a drum.
**Covered Equipment**

The OSHA rule also applies to the following more specialized types of equipment when used in construction:

- Floating cranes
- Cranes on barges
- Locomotive cranes
- Multi-purpose machines when configured to hoist and lower (by means of a winch or hook) and horizontally move a suspended load
- Industrial cranes (such as carry-deck cranes)
- Dedicated pile drivers
- Service/mechanic trucks with a hoisting device
- Monorail mounted cranes
- Pedestal cranes
- Portal cranes
- Overhead and gantry cranes (except that such cranes that are permanently installed in a facility are subject to OSHA’s general industry standard, 29 CFR 1910.179, even when used for construction work.)
- Straddle cranes
- Sideboom cranes
- Digger derricks (except when used for auguring holes for poles carrying electric and telecommunication lines, placing and removing the poles, and for handling associated materials to be installed on or removed from the poles).

**Excluding Equipment**

**Digger Derricks**

A "digger derrick" or "radial boom derrick" is a specialized type of equipment designed to install utility poles. A digger derrick typically is equipped with augers to drill holes for the poles and with a hydraulic boom to lift the poles and set them in the holes. Employers also use the booms to lift objects other than poles; accordingly, electric utilities, telecommunication companies, and their contractors use booms both to place objects on utility poles and for general lifting purposes at worksites.

TEREX® DIGGER DERRICK — USED FOR AUGURING HOLE FOR UTILITY POLE (NOT COVERED).
Excluded Equipment

The following types of equipment are specifically excluded from 29 CFR 1926 Subpart CC:

- Equipment that would otherwise be covered while it has been converted or adapted for a non-hoisting/lifting use. Such conversions/adaptations include, but are not limited to, power shovels, excavators, and concrete pumps.

- Power shovels, excavators, wheel loaders, backhoes, loader backhoes, and track loaders. This machinery is also excluded when used with chains, slings, or other rigging to lift suspended loads.

- Automotive wreckers and tow trucks when used to clear wrecks and haul vehicles.

- Digger derricks when used for auguring holes for poles carrying electric and telecommunication lines, placing and removing the poles, and for handling associated materials to be installed on or removed from the poles. Digger derricks used in such pole work must comply with either 29 CFR 1910.269 (electric lines) or 29 CFR 1910.268 (telecommunication lines).

- Machinery originally designed as vehicle-mounted aerial devices (for lifting personnel) and self-propelled elevating work platforms.

- Telescopic/hydraulic gantry systems.

- Stacker cranes.

- Powered industrial trucks (forklifts) except when configured to hoist and lower (by means of a winch or hook) and horizontally move a suspended load.

- Mechanic's truck with a hoisting device when used in activities related to equipment maintenance and repair.

- Machinery that hoists by using a come-a-long or chainfall.

- Dedicated drilling rigs.

- Gin poles when used for the erection of communication towers.

- Tree trimming and tree removal work.

- Anchor handling or dredge-related operations with a vessel or barge using an affixed A-frame.

- Roustabouts.

- Helicopter cranes.

NOTE: Equipment exempt from subpart CC of 29 CFR 1926, must still comply with all other applicable construction standards.
Special Rules for Articulating/Knuckle Boom Cranes

When used to Deliver Material to a Construction Site...

It is common for material to be delivered to and unloaded on a construction site using a truck on which is mounted an articulating/knuckle-boom crane. Such equipment is covered by the standard when used in construction work.

When such equipment delivers materials by placing them on the ground without arranging them in a particular sequence for hoisting, the activity is not considered construction work and is not covered under the standard. This exclusion applies regardless of the type of material being delivered.

When an articulating/knuckle boom crane is used to transfer materials onto a structure, the activity is considered construction work, however, the activity is excluded* from the standard if all of the following conditions are met:

- The equipment is an articulating/knuckle-boom truck crane.
- The materials are sheet goods (such as sheet rock, plywood, or sheets of roofing shingles) or packaged goods (such as roofing shingles, bags of cement, or rolls of roofing felt).
- The equipment uses a fork/cradle at the end of the boom to deliver the materials.
- The equipment is not used to hold, support, or stabilize the material to facilitate a construction activity, such as holding material in place while it is attached to the structure.
- The equipment is equipped with a properly functioning automatic overload prevention device.

* This exception, as noted, is limited to delivery of sheet goods and packaged goods.

- It does not apply to delivery of prefabricated components or building sections, such as roof trusses and wall panels.
- It does not apply to delivery of structural steel members or components of a systems-engineered metal building.

✓ Equipment is covered under OSHA 29 CFR 1926 Subpart CC.

✗ Equipment is excluded from OSHA 29 CFR 1926 Subpart CC.
§1926.1401 – Definitions

**Discussion Points**

- Assembly/Disassembly Director
- Competent Person
- Qualified Person
- Controlling Entity

**Terms & Definitions**

The terms discussed below are of general interest and deserve particular attention. The definitions are in bold, and following each definition is an explanation of its significance. A complete list of terms used in mobile crane operations is available in the *Glossary* section of this manual.

**A/D director (Assembly/Disassembly director)** means an individual who meets the requirements for an A/D director, irrespective of the person's formal job title or whether the person is non-management or management personnel.

All assembly and disassembly of cranes must be carried out under the direction of an A/D director. The A/D director must be both a "competent person" and a "qualified person," or must be a "competent person" assisted by one or more "qualified persons."

**Competent person** means one who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them.

A competent person must conduct shift and monthly inspections of all equipment. The A/D director must meet the test for a competent person (as well as a qualified person). In general, a qualified crane operator who has the authority to take corrective measures will be a competent person under this definition.

**NOTE:** OSHA requires employers to maintain an accident prevention program that provides for frequent and regular inspections of the job-site, materials, and equipment to be made by a competent person.
§1926.1401 — Definitions

**Qualified person** means a person who, by possession of a recognized degree, certificate, or professional standing, or who by extensive knowledge, training and experience, successfully demonstrated the ability to solve/resolve problems relating to the subject matter, the work, or the project.

Numerous duties must be carried out by a person who meets the definition of a qualified person. These include conducting annual/comprehensive inspections of all equipment as well as inspections of modified equipment. The A/D director must be a qualified person as well as a competent person. A qualified person also is responsible for duties, including those dealing with developing assembly/disassembly procedures, wire rope safety, fall protection, maintenance and repair, hoisting personnel, multiple crane/derrick lifts, equipment modifications, tower cranes, derricks, and floating cranes/derricks.

**Controlling entity** means an employer that is a prime contractor, general contractor, construction manager or any other legal entity which has the overall responsibility for the construction of the project – its planning, quality and completion.

The controlling entity is responsible for seeing that the ground conditions are adequate to support the equipment. The controlling entity must also establish a system to coordinate the operations of two cranes that operate within each other's working radius.

† Responsible Employer!
Match the letter to correct acronym, word or phrase...

_____ General Duty Clause
_____ OSHAct
_____ Creating Employer
_____ Exposing Employer
_____ Correcting Employer
_____ Controlling Employer
_____ Federal Crane Standards
_____ Industry Consensus Standards for Mobile & Locomotive Cranes
_____ American Society of Mechanical Engineers
_____ A/D Director
_____ Competent Person
_____ Qualified Person
_____ Controlling Entity

a. Shall furnish to each of his employees employment and a place of employment which are free from recognized hazards that are causing or are likely to cause death or serious physical harm to his employees.

b. An employer who causes a hazardous condition that violates an OSHA standard.

c. An employer whose own employees are exposed to the hazard.

d. An employer who is responsible for correcting a hazard on the exposing employer’s worksite.

e. An employer who has general supervisory authority over the worksite, including the power to correct safety and health violations or requiring others to correct them.

f. 29 CFR 1926, Subpart CC

g. ASME

h. B30.5

i. Occupational Safety & Health Act

j. Assembly/Disassembly Director

k. One who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them.

l. A person who, by possession of a recognized degree, certificate, or professional standing, or who by extensive knowledge, training and experience, successfully demonstrated the ability to solve/resolve problems relating to the subject matter, the work, or the project.

m. An employer that is a prime contractor, general contractor, construction manager or any other legal entity which has the overall responsibility for the construction of the project – its planning, quality and completion.
Discussion Points

- OSHA's power line clearance distance.
- Identifying the crane's *work zone*.
- Steps you must take to maintain minimum clearance distance, *preventing encroachment/electrocution*.
- Alternatives to 20-foot clearance (Table A).
- Employee training, *Power Line Hazards Awareness*.
- Equipment operations closer than Table A.

DANGER – HIGH VOLTAGE!

Electrocutions caused by a crane, load, or load line contacting a power line have caused numerous fatalities. To prevent such accidents in the future, OSHA standards contain detailed, systematic procedures that employers must follow when operating cranes near power lines.

These procedures are designed to:

1. Prevent equipment from making electrical contact with power lines.
2. Protect workers in the event that such contact occurs.

*OSHA’s Power Line Clearance Distance*

Keeping a safe distance from power lines is the key to preventing power line accidents. Therefore, the first step an employer must take when planning to operate a crane on a site where a power line is present is to identify the crane's *work zone* and use that work zone to determine how close it could come to the power line. If it’s determined that no part of the crane, load, or load line could get closer than 20 feet to a power line, no further precautions are required. If the initial plan for the crane's use changes during the project, an employer must reevaluate whether the equipment could get closer than 20 feet to the power line.

**NOTE:** If the line's voltage is over 350,000 volts, a 50-foot, rather than 20-foot, minimum clearance must be maintained.
§1926.1407 - .1411 – Power Lines

**Identifying the Crane’s Work Zone**

There are two ways to identify the *work zone* and use it to determine whether the equipment could get closer than 20 feet to the power line.

1. If the equipment (crane, load, load line, or rigging) could not get closer than 20 feet to the line even if the crane is operated at its maximum working radius, the 20-foot requirement is satisfied.

2. Alternatively, an employer may establish a work zone by establishing boundaries (using flags or a device such as a range limit device or range control warning device) that are more than 20 feet from the power line and prohibiting the operator from operating the equipment past those boundaries.

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- **Work Zones are defined as 360° Around the Equipment**

![Diagram of 360° Around the Equipment]

- **Define work area 360° around the equipment.**

- ✓ **Mobile crane working at its maximum working radius — load and all rigging is kept 20 feet away.**
Q: Can the crane get closer than 20 feet?

If a crane is operated near a power line, and 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, the employer must choose one of the following options:

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

- **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 Preventing Encroachment/Electrocution.

- **Option (3) – Table A clearance.** [See Alternative to 20-foot Clearance (Table A) and implement the measures specified in Preventing Encroachment/Electrocution]

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**Preventing Encroachment/Electrocution**

If it’s determine that part of the crane, load, or load line could come closer to the power line than the required minimum clearance distance (either 20 feet or the Table A clearance), the employer must either deenergize and ground the line or take specified steps to maintain the required minimum clearance distance.

**STEPS YOU MUST TAKE TO MAINTAIN THE REQUIRED MINIMUM CLEARANCE DISTANCE:**

- Conduct a planning meeting with the crane 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.

- If tag lines are used, they must be non-conductive.

- Erect and maintain an elevated warning line, barricade, or line of signs equipped with flags or similar high-visibility markings at the minimum clearance distance. If the operator cannot see the elevated warning line, a dedicated spotter must be used to signal the operator that the crane is passing the marked line.

In addition to conducting a planning meeting, using non-conductive tag lines (if needed), and erecting an elevated warning line or barricades, an employer must use at least one of the following precautions to further prevent electrical contact: **(Choose one)**

- A dedicated spotter (a worker whose only duty is to observe the clearance between the equipment and the line) who is in continuous contact with the operator.

- A proximity alarm set to give the operator sufficient warning to prevent encroachment.

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

- A device that automatically limits the crane's range of movement, set to prevent encroachment.

- An insulating link/device installed between the end of the load line and the load.
**Power Line Safety Decision Flow Chart**

Could you get within 20 feet* of power line?

- **Option (1)** Deenergize & Ground
- **Option (2)** 20 Foot Clearance
- **Option (3)** Ask utility for voltage and use Table A (Minimum Clearance Distances)

**Encroachment/Electrocution Prevention Measures**

- Planning meeting
- If used, tag lines must be nonconductive
- Erect and maintain an elevated warning line, barricade or line of signs.

PLUS (Choose one of the following):

- Proximity alarm
- Dedicated spotter
- Range control warning device
- Range limiting device
- Insulating link/device

* For lines rated over 350 kV, substitute 20 feet for 50 feet.
Alternative to 20-foot Clearance (Table A)

If an employer knows the line's voltage, the minimum clearance distance in Table A in lieu of 20 feet may be used.

Table A provides:

<table>
<thead>
<tr>
<th>Voltage (nominal, kV, alternating current)</th>
<th>Minimum clearance distance (feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>up to 50</td>
<td>10</td>
</tr>
<tr>
<td>over 50 to 200</td>
<td>15</td>
</tr>
<tr>
<td>over 200 to 350</td>
<td>20</td>
</tr>
<tr>
<td>over 350 to 500</td>
<td>25</td>
</tr>
<tr>
<td>over 500 to 750</td>
<td>35</td>
</tr>
<tr>
<td>over 750 to 1,000</td>
<td>45</td>
</tr>
<tr>
<td>over 1,000</td>
<td>(as established by the utility owner/operator or registered professional engineer who is a qualified person with respect to electrical power transmission and distribution).</td>
</tr>
</tbody>
</table>

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.

Voltage Information

One way to determine the line's voltage is to ask the line's owner or operator. The utility must respond to such a voltage inquiry within two working days.

If Table A is used to determine the minimum clearance distance, the employer must determine whether any part of the crane, load, or load line could get closer than the Table A distance to a power line if the equipment is operated up to its maximum working radius in the work zone.
§1926.1407 - 1411 – Power Lines

Deenergize & Ground

Deenergizing and visibly grounding the line will protect against electrocution and avoid the need for additional precautions. However, the employer must rely on the power line’s owner or operator to take these steps, and utilities are generally unwilling to deenergize their lines because doing so will cut off service to their customers. As a result, this precaution will usually not be available.

Assume that all power lines are energized unless the utility owner/operator confirms that the power line has been and continues to be deenergized and the line is visibly grounded at the worksite.

Nonconductive

Nonconductive means that, because of the nature and condition of the materials used, and the conditions of use (including environmental conditions and condition of material), the object in question has the property of not becoming energized (that is, it has high dielectric properties offering a high resistance to the passage of current under the conditions of use).

- Polypropylene Rope
- Clean & Dry
- High-voltage Rated Rubber Gloves

Insulated Link Device

Insulated link device means an insulating device listed, labeled, or accepted by a Nationally Recognized Testing Laboratory in accordance with 29 CFR 1910.7.

The following organizations have been recognized by OSHA in accordance with 29 CFR 1910.7 to test and certify equipment or materials (products) requiring approval by certain OSHA safety standards:

- Canadian Standards Association (CSA)
  Etobicoke (Toronto), Ontario. Canada
- Communication Certification Laboratory, Inc. (CCL)
  Salt Lake City, UT. USA
- Curtis-Straus LLC (CSL)
  Littleton, MA. USA
- FM Approvals LLC (FM)
  Norwood, MA. USA
- Intertek Testing Services NA, Inc. (ITSNA)
  Cortland, NY. USA
- MET Laboratories, Inc. (MET)
  Baltimore, MD. USA
- NSF International (NSF)
  Ann Arbor, MI. USA
- QPS Evaluation Services Inc. (QPS)
  Toronto, Ontario. Canada
- SGS U. S. Testing Company, Inc. (SGSUS)
  Fairfield, NJ. USA
- Southwest Research Institute (SWRI)
  San Antonio, Texas. USA
- TÜV SÜD Product Services GmbH (TÜVPSG)
  Munich, Germany
- Underwriters Laboratories Inc. (UL)
  Northbrook, IL. USA
§1926.1407 - .1411 – Power Lines

**Dedicated Spotter**

The dedicated spotter must be able to judge the distance between the equipment and the line and inform the operator if the equipment is getting too close to the line. Therefore, the spotter must:

- Be equipped with a visual aid (such as a clearly visible line painted on the ground or a clearly visible line of stanchions) to assist in identifying the minimum clearance distance.
- Be positioned to effectively gauge the clearance distance.
- Where necessary, use equipment that enables the spotter to communicate directly with the operator.
- Give timely information to the operator so that the required clearance distance can be maintained.
- Be trained to be able to perform his/her duties effectively.

**Operations below Power Lines**

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 deenergized and visibly grounded the power line at the worksite, or
- The highest point of the equipment's boom, even if completely extended and vertical, will be more than the required minimum distance from the power line.
Employee Training (Power Line Hazards Awareness)

If the equipment contacts a power line, death or injury may be avoided if the workers in and on the crane know and understand the steps they can take to protect themselves. In general, the crane operator and any other person on the crane will be safe as long as they remain on the crane. The greatest danger is faced by a person who simultaneously touches both the crane and the ground, but a person who is near, but not touching, the crane can also suffer electric shock. To ensure that employees have the information they need to protect themselves, train each operator and crew member assigned to work with the equipment on how to avoid electrocution in the event the equipment contacts a power line. Such training must include:

- Information regarding the danger of electrocution if a person simultaneously touches the equipment and the ground.
- 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.
- The safest means of evacuating from equipment that may be energized.
- The danger of the potentially energized zone around the equipment (step potential).
- The need for crew in the area to avoid approaching or touching the equipment and the load.
- Safe clearance distance from power lines.
- The limitations of an insulating link/device, proximity alarm, and range control (and similar) device, if used.
- How to properly ground equipment and the limitations of grounding.

Current can flow outward through the ground in a ripple pattern from the equipment in contact with a power line. (Step Potential)
Assembling a Crane near a Power Line

The precautions described above for crane operations must also be taken when assembling or disassembling a crane near a power line. Under no circumstances may a crane be assembled or disassembled beneath an energized power line.

Precautions for Moving Equipment

A crane traveling with a load must comply with OSHA’s minimum clearance distance and associated precautions. If the crane is traveling with no load, the clearance distances established in Table T must be maintained.

Table T provides:

<table>
<thead>
<tr>
<th>Voltage (nominal, kV, alternating current)</th>
<th>While Traveling – Minimum clearance distance (feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>up to 0.75</td>
<td>4</td>
</tr>
<tr>
<td>over .75 to 50</td>
<td>6</td>
</tr>
<tr>
<td>over 50 to 345</td>
<td>10</td>
</tr>
<tr>
<td>over 345 to 750</td>
<td>16</td>
</tr>
<tr>
<td>over 750 to 1,000</td>
<td>20</td>
</tr>
<tr>
<td>over 1,000</td>
<td>(as established by the utility owner/operator or registered professional engineer who is a qualified person with respect to electrical power transmission and distribution).</td>
</tr>
</tbody>
</table>

In determining whether the equipment will maintain the required clearance distance, take into account the effects of speed and terrain on the equipment's movement (including movement of the boom/mast). In addition, if any part of the equipment can get closer than 20 feet to the line, use a dedicated spotter to observe the clearance and signal the operator in order to keep the required minimum clearance.
Equipment Operations Closer than Table A

In some circumstances, it is impossible to perform a required lift while staying the required minimum distance from a power line. The standard provides a limited exception for such circumstances that allows operations closer than the minimum distance. However, it requires additional precautions due to the extreme danger of operating so close to a power line.

Before using this exception, you must determine that specific work required to complete the project cannot be performed while maintaining the Table A clearance. In making this determination, you must consider whether an alternative method of performing the lift, such as repositioning the crane or the load, will enable you to maintain the required minimum distance. If you have decided that it is absolutely necessary to operate closer than the required minimum distance, you must consult the utility that owns or operates the line to determine whether it is feasible to deenergize and ground or relocate the line. Only if deenergizing/grounding or relocation is not feasible may you operate closer than the Table A distance to an energized line. In such a case, you must take the following precautions to protect workers:

(1) DETERMINE AN ABSOLUTE MINIMUM CLEARANCE. You must have the power line owner/operator or a registered professional engineer who is a qualified person with respect to electrical power transmission and distribution determine the minimum clearance distance that must be maintained to prevent electrical contact in light of the on-site conditions. The factors that must be considered in making this determination include, but are not limited to: conditions affecting atmospheric conductivity; time necessary to bring the equipment, load line, and load (including rigging and lifting accessories) to a complete stop; wind conditions; degree of sway in the power line; lighting conditions; and other conditions affecting the ability to prevent electrical contact.

(2) HOLD A PLANNING MEETING. You must hold a planning meeting with the utility owner/operator (or registered professional engineer who is a qualified person with respect to electrical power transmission and distribution) to determine the procedures that will be followed to prevent electrical contact and electrocution.
§1926.1407 - .1411 – Power Lines

**Equipment Operations Closer than Table A (continued)**

(3) **USE PROTECTIVE PROCEDURES.** The procedures required by the standard and any additional procedures developed at the planning meeting must be followed. The following procedures are required by the standard and **must be followed without exception:**

- If the power line is equipped with a device that automatically reenergizes the circuit in the event of a power line contact, before the work begins, the automatic reclosing feature of the circuit interrupting device must be made inoperative if the design of the device permits.
- A dedicated spotter who is in continuous contact with the operator must be used to ensure that the equipment does not breach the minimum clearance. The requirements for a dedicated spotter are discussed above.
- An elevated warning line, or barricade (not attached to the crane), in view of the operator (either directly or through video equipment), equipped with flags or similar high-visibility markings, must be erected.
- An insulating link/device must be installed at a point between the end of the load line (or below) and the load. (NOTE: certain safety procedures or devices may be substituted for a Nationally Recognized Testing Laboratory-approved insulating link during an interim time period. Refer to section 1926.1410(d)(4)(iv) and (v) of the standard for details)
- All employees who may come in contact with the equipment, the load line, or the load (except operators located on the equipment) must be insulated or guarded from the equipment, the load line, and the load by wearing insulating gloves rated for the voltage involved or using another effective means of insulating them from the equipment.
- Nonconductive rigging must be used.
- If the equipment is equipped with a device that automatically limits range of movement, it must be used and set to prevent any part of the equipment, load line, or load (including rigging and lifting accessories) from breaching the minimum approach distance.
- Any tag line that is used must be of the nonconductive type.
- Barricades forming a perimeter at least 10 feet away from the equipment must be erected to prevent unauthorized personnel from entering the work area. In areas where obstacles prevent the barricade from being at least 10 feet away, the barricade must be as far from the equipment as feasible.
- Workers other than the operator must be prohibited from touching the load line above the insulating link/device and crane. The operator is excluded from this requirement because, while on the equipment, the operator is, in effect, touching the load line above the insulating link/device. However, if the operator is remotely operating the equipment from the ground, he/she must use either wireless controls that isolate the operator from the equipment or insulating mats that insulate the operator from the ground.
- Only personnel essential to the operation are permitted in the area of the crane and load.
- The equipment must be properly grounded.
- Insulating line hose or cover-up must be installed by the utility owner/operator except where such devices are unavailable for the line voltages involved.
- Each operator and crew member assigned to work with the equipment must be trained in the topics listed earlier in this section.
Equipment Operations Closer than Table A (continued)

(4) APPOINT A PROJECT DIRECTOR. You, along with the utility owner/operator (or registered professional engineer) and all other employers involved in the work, must identify one person who will direct the implementation of the procedures. That person must have the authority to stop work at any time to ensure safety.

(5) RECONSIDER YOUR PLAN IF A PROBLEM ARISES. The danger of operating a crane close to a power line cannot be overemphasized. Procedures that may appear adequate at the beginning of a job may not be adequate in practice. For example, if electricity arcs from the line to the equipment, whatever precautions are being taken are not sufficient. Therefore, if there is any indication that the procedures being followed are inadequate to protect workers, you must safely stop operations and either develop new, more protective procedures or have the utility owner/operator deenergize and visibly ground or relocate the power line before resuming work.
**Job-site Description & Company Information**

- Address/Location of Lift: 
- Controlling Contractor: 
- Crane Owner: 
- Subcontractor: 

**Description of Power Line & Activity**

- [ ] Assembly/Disassembly
- [ ] Equipment Operations
- [ ] Traveling Under or Near Power Line w/no Load
- [ ] Equipment Operations Closer than Table A*  
  * Must provide infeasibility study  
  (Attach infeasibility study)

- Utility Owner/Operator: 
  - [ ] Up to 350 kV
  - [ ] Over 350 kV
  - [ ] Over 1000 kV*
  - [ ] Known Voltage: *(Required if using Table A)*  
  [_________ kV]
  * Qualified Person: 

**Voltage Information Request:** [Request Date] – [Confirmed by (name of Utility Representative)]

**Power Line Clearance Distance:**

- [ ] 20 feet  
  - Selected from Table A [_________]
- [ ] 50 feet  
  - Selected from Table T [_________]
- [ ] Other [_________]

**Personnel**

- A/D Director: 
- Operator: 
- A/D Crew: 
- Dedicated Spotter: 
- Other Workers: 
- Crane Signal Person: 

Go to *Prevention Encroachment/Electrocution* steps, page 2 of 2.
Prevention Encroachment/Electrocution

Tag Lines Nonconductive?  ☐ Yes  ☐ No

Describe:

Elevated Warning Line, Barricade or Line of Signs?  ☐ Yes  ☐ No

Describe:

Additional Measures (select all that apply):

☐ Dedicated Spotter  ☐ Proximity Alarm
☐ Range Control Warning Device  ☐ Range Limiting Device
☐ Insulating Link/Device

Training [conducted in accordance with §1926.1408(g)]

The employer must train each operator and crew member assigned to work with the equipment on all of the following:

☑ Procedures to be following in the event of electrical contact with power line.

☑ Power lines are presumed to be energized unless the utility owner/operator or a qualified person confirms that a line is insulated.

☑ Limitations of an insulating link/device, proximity alarm, and range control device.

☑ Procedures to be followed to properly ground equipment and limitations of grounding.

Training Conducted by:  

Date:  

CONSTRUCTION SAFETY COUNCIL  38  MANAGING MOBILE CRANES
REFERENCE & RESOURCES

- OSHA Standard 29 CFR 1926 Subpart CC.