



Living and Working Safely Around Power Lines

Raymond L. Huhnke
Professor and Extension
Agricultural Engineer

People who are rushed, tired, distracted, inattentive, or who take unnecessary chances when working near power lines are prime targets for electrocution.

Facts to Live By

- Knowing these electrical facts could save a life.
- Most overhead power lines have no protective insulation. Any contact with them is dangerous.
- Electricity seeks the most direct route to ground even through a human body.
- Materials such as lumber, tree limbs, tires, ropes, and hay can conduct electricity, depending on moisture content and surface contamination.
- The flow of electricity through the human body can cause severe burns, cardiac arrest, or death. Less than one ampere can kill.
- When people or objects touch or come too close to a power line, an instant flow of electricity goes through the body or object to the ground.

Avoid Hazards with Overhead Power Lines

Above-ground electrical lines are designed, constructed, and maintained to be safe. But each year farmers, family members, and workers are seriously injured or killed while:

- Moving tall machinery and equipment (hoppers, bins, augers, conveyors, equipment wings, scaffolds, or portable buildings) into overhead power lines.
- Cutting down trees or pruning limbs that fall into power lines.
- Clearing storm damaged trees, limbs, or other debris that touches power lines or is close to fallen power lines.
- Touching power lines with tools.
- Attempting to move or relocate fallen electrical wires.
- Snagging wires with machinery or equipment.
- Lifting power lines by hand, with lumber, or farm tools when moving high loads or buildings.
- Raising or carrying ladders, poles, rods, irrigation pipes, or other long materials into power lines.
- Raising dump truck boxes, front end loaders, well-digging equipment, or farm equipment into power lines.
- Touching or standing close to equipment or its load that is in contact with power lines.

Oklahoma Cooperative Extension Fact Sheets are also available on our website at:
<http://osufacts.okstate.edu>

- Contacting power lines while installing or removing antennas.
- Attempting to rescue a person who is in contact with live wires or equipment that is touching power lines.

How Close is Electrical Power Line Danger?

A common rule of thumb when estimating a safe clearance is: "If you don't know, don't go!" Visual observation and height estimations cannot provide a safe, accurate answer. From a safety standpoint, farmers should know the height of their machinery and equipment and the available clearances between them and the power lines around their farming operations.

The National Electrical Code (NEC) and the National Electrical Safety Code (NESC) outline minimum vertical clearances (height from ground to cable) for overhead power lines and minimum depths for buried cables. A local power supplier monitors and maintains those clearances for farmers safety and the safety of their personnel. **To be safe, think of these as maximum clearances.**

Power line clearances commonly found in agricultural settings:*

Neutrals and guys	15' 6"
All multiplex	16' 0"
Cables less than 750 volts	16' 6"
Cables more than 750 volts	18' 6"
Insulated cables attached to buildings	
(120/240 volt service)	12' 0"
(480 volt service)	12' 2"
6"	
Insulated drip loops	
(120/240 volt service)	10' 0"
0"	
(480 volt service)	10' 0"
6"	
Buried cables less than 600 volts	2' 0"
Buried cables more than 600 volts	2' 6"

*Based on 1993 NEC and NESC interpretations.

Compare These Numbers

As the scope of agricultural enterprises increase, so does machinery and equipment size. Compare the

heights of the following to the minimum power line clearances above. In all cases, these exceed the available clearances around farm buildings.

Ford - New Holland TR96 combine 13' 10"
JD 280 front end loader (bucket raised) 14' 10"
JD 535 round baler (tailgate raised) 12' 1"

Do Not Attempt to Move Power Lines

Occasionally, a power line may need to be lifted. A person might be tempted to use lumber, PVC pipe, or his or her hands to lift the power line. *Attempting to lift power lines in this manner is an invitation for disaster.* Electrical power professionals insist there is no truly safe way for consumers to lift or move power lines. Remember, professionals use specially designed and maintained tools to work with power lines, and even then a danger of electrical shock exists. **Don't take a chance.** Call a local power supplier for assistance in moving or lifting power lines.

Safely Digging Near Buried Power Cables

The trend in many areas is to bury electrical cables. This is especially true around the farmstead where tall machinery, equipment, and high loads are frequently moved about. Underground cables eliminate the danger of contact with overhead power lines, but pose a danger when digging or deep plowing near them. When performing these activities around the farm, know where lines are located and use extreme caution. If the underground power line belongs to a power supplier, call the supplier or OKIE (800-522-6543) for assistance before digging.

Protection from Danger

Survey the electrical power system on the farm. Locate and map overhead and buried power lines in the fields, pastures, around buildings, grain bins, and silos. Keep this information on file.

- Immediately report all power lines that do not appear safe. Check for broken guy wires, leaning poles, low hanging

wires, broken insulators, and exposed buried cables.

- Inform the family and workers of power line locations that could present a danger to them.
- If equipment or other objects must be moved in the vicinity of power lines, use extreme caution. Watch the load clearance carefully and, if possible, have someone to guide. Move slowly and carefully, maintaining a safe distance of approximately 10 feet from the power line.

A Strategically Placed List Can Save a Life

In the case of an accident, reaction time is critical. The sooner professional medical treatment is available to a victim, the better the chance for survival. Speed up the arrival of emergency assistance by:

- Posting a list of emergency numbers near telephones (including all vehicles with cellular telephones). Remember, the 911 emergency number is not valid in all areas.
- Developing a clear, concise description of how emergency personnel can reach locations. Time can be lost by providing vague or confusing directions. Be sure to include road names or numbers, landmarks, accurate distances, and other specific information in your directions.

Basic Plan for Emergency Treatment

1. Call (or have someone else call) for emergency assistance as soon as possible.
2. Protect yourself. Make sure the injured person is not in contact with live wires and that the wires are out of the rescue path. Don't put oneself in jeopardy.
3. Initiate primary medical treatment or life support and continue as needed until assistance arrives.

For Additional Information

For more information, contact one of the following:

- A local electrical power supplier.
- A nearest rural electric cooperative.
- The Oklahoma Association of Electric Cooperatives, P.O. Box 54309, Oklahoma City, OK 73154-1309. Phone: 405-478-1455.
- The Okie One System is the Oklahoma One Call System, Inc., P.O. Box 1027, Oklahoma City, OK. 73101. Phone: 800-522-6543.

Oklahoma State University, in compliance with Title VI and VII of the Civil Rights Act of 1964, Executive Order 11246 as amended, Title IX of the Education Amendments of 1972, Americans with Disabilities Act of 1990, and other federal laws and regulations, does not discriminate on the basis of race, color, national origin, gender, age, religion, disability, or status as a veteran in any of its policies, practices, or procedures. This includes but is not limited to admissions, employment, financial aid, and educational services.

Issued in furtherance of Cooperative Extension work, acts of May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture, Robert E. Whitson, Director of Cooperative Extension Service, Oklahoma State University, Stillwater, Oklahoma. This publication is printed and issued by Oklahoma State University as authorized by the Vice President, Dean, and Director of the Division of Agricultural Sciences and Natural Resources and has been prepared and distributed at a cost of 20 cents per copy. 0507