

# ELECTRICAL SAFETY

ON YOUR FARM



A GUIDE TO SAFELY UTILIZING THE MANY BENEFITS  
ELECTRICITY OFFERS AGRICULTURE



*We're on for you.™*

**A**t the flip of a switch or the push of a button, electricity is always there to help make your farm productive and efficient. It's easy to take the convenience and reliability of electricity for granted, but taking its dangers for granted can be deadly.

That's why Alliant Energy is committed to helping farmers work safely around electricity. Your job is important to all of us; our job is to help you do it safely.

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Most electrical safety rules are common sense; but when you're working around the farm, it's easy to get caught up in a task or distracted by an outside disturbance. Take a moment to review these guidelines, and keep them in mind whenever you're working around electricity.

**DO** keep all electrical devices, including extension cords, away from animals, water or damp areas.

**DO** keep all power tools, motors and other electrical equipment in good repair.

**DO** check equipment, cords and plugs frequently for signs of fraying, cracking or scorching.

**DO** keep all cords neatly secured and out of traffic areas.

**DO** tag the fuse or breaker switch if you need to turn off the power, so no one else turns it on while you're working.

**DO** call before you dig. Just dial your state's "One Call" or Digger's Hotline service at least three days before you start to dig to have underground service lines marked.

- In Iowa, call Iowa One-Call at 1-800-292-8989
- In Illinois, call JULIE, Inc., at 1-800-892-0123
- In Minnesota, call Gopher State One Call at 1-800-252-1166
- In Wisconsin, call Digger's Hotline at 1-800-242-8511

**DO** look up for overhead electrical lines when moving tall equipment.

**DO** apply "Look Up" safety decals to augers and other tall equipment.

**DO** use ground fault circuit interrupter (GFCI) receptacles on all outlets that are outside or near water sources. If there is any variation in the current, the GFCI will automatically cut the flow of electricity through the circuit, greatly reducing the severity of the shock.

**DO** familiarize yourself with the location of all overhead and underground power lines, utility equipment such as meters and transformers, and the service panel at each of your buildings.

**DON'T** cut off the third grounding prong on a plug. The grounding conductor acts as a protection between electrical wire and people or animals near the wire.

**DON'T** use extension cords, power strips, outlet extenders or "cheater" adapter plugs as permanent fixtures. These devices are designed only for temporary use and can overheat or overload a circuit, risking an electrical fire.

**DON'T** oversize fuses. Circuits are designed for a given amount of current only.



Overhead power lines are a significant risk of electrocution on the farm. Always keep in mind that most overhead power lines have no protective insulation. In addition, high-voltage lines can sag several feet when they are hot. Allow extra space near high voltage lines; the current can “arc” to conductive materials near the line without actually touching.

- Be aware of power lines whenever you’re moving equipment like augers, conveyors, sprayers, bale elevators, hoppers and scaffolds. Maintain at least a 10-foot clearance.
- Keep smaller equipment like ladders, poles, rods or irrigation pipes at least 10 feet away from overhead power lines.
- If you’re planning a new building, contact your Alliant Energy agribusiness representative or a licensed electrician for help placing electrical service lines.
- Take care when climbing, trimming or cutting trees, especially

after a storm. Broken or damaged power lines can send electricity through tree limbs and fences, so use extreme caution with chain saws, axes and pruning poles.

- Be sure your children do not fly kites or balloons with long strings in the vicinity of power lines.

### Grain bin regulations

The National Electrical Safety Code requires that power lines be at least 18 feet above the highest point on any grain bin with which portable augers and other portable filling equipment is used. The clearance must be maintained a specified distance around the bin. Contact your agribusiness representative for assistance in planning before the bin site is confirmed.



The National Electrical Code requires different wiring types and techniques for the three general types of agriculture buildings:

- **Damp buildings:** High levels of moisture, corrosive dust and gases inside animal housing, milk houses and silos create electrical risks. These buildings require dust- and moisture-tight, non-corroding materials and wiring methods.
- **Dusty buildings:** Fertilizer, dry grain and hay storage buildings can contain “explosive dust,” so they require dust- and ignition-proof wiring.
- **Dry buildings:** Machine storage buildings, shops and unattached garages can be wired similar to residential buildings.

### Grounding requirements

Proper grounding is also an essential part of a safe electrical system. Grounding systems act to protect people and animals from electrical shock and help reduce the possibility of an electrical fire.

Periodically have the ground rods and wires at the service entrance panels checked by a qualified electrician for damage or loose connections.



Your qualified electrician should check that the neutral wire and grounding wire are not connected together at any point in your electrical system other than the main service panel.

Your farm must have its own electrical system grounding, in addition to any lightning protection grounding system.

Good maintenance can keep your electrical system and equipment operating safely for years to come—but neglecting it can quickly lead to accidents, fires or costly downtime.

- Keep all electrical equipment and service areas clean. Clear away dust and cobwebs often, and make sure moisture isn't accumulating.
- Make sure all wiring and cords are protected from human and animal contact or damage from equipment (e.g. cords traveling under a heavy storage cabinet).
- Check to see if all fuses in the service panel are the correct size for their circuits.
- Check outlets and switches for loose connections or broken or missing cover plates.
- When replacing light bulbs, make sure the wattage doesn't exceed the fixture's rating.
- Keep high-intensity light fixtures away from combustible materials.
- Be sure to turn off and unplug equipment before cleaning or repairing. Turn off the power at the service panel when checking outlets, switches and light fixtures.



Lightning is a major cause of farm fires. A certified lightning protection system can be a good investment for your farm buildings. These systems provide a direct path to the ground for electricity from a lightning strike, reducing the risk of injuries, fire and surge damage.

A lightning protection system consists of several parts:

- Air terminals (lightning rods): Metal rods attached to building roofs to intercept the lightning.
- Ground terminations: Metal rods driven into the ground (eight-foot minimum recommended).
- Conductors: Aluminum or copper cables that connect the lightning rods to the ground terminations.
- Surge arrestors and suppressors: Devices that protect electrical equipment by absorbing and/or dissipating excess electricity.
- The lightning protection grounding system shall be connected to the electrical grounding system at one location, preferably outside. Any non-current carrying metal part of the electrical system that is within six feet of the lightning system should be bonded to prevent arcing in the event of a lightning strike.



## PORTABLE AND STANDBY GENERATORS

Generators can come in handy if you experience a power outage, but these devices must be used with extreme caution. When purchasing or using this type of equipment, check your local safety codes and read the manufacturer's directions carefully. As a property owner, you are responsible for the safe installation and use of the equipment, and you can be held liable for any injuries or damage.

- Make sure the area is well ventilated. It is recommended that portable generators not be operated indoors. If air isn't circulating, deadly carbon monoxide fumes can quickly build up.
- Generator connections must be installed in a manner to prevent electricity from feeding from the generator back on to the utility system. This is accomplished with a transfer switch.
- The generator must be rated to have a sufficient wattage for the electrical load it will operate.

Only a qualified electrician should install a permanent standby generator. This will help ensure that the unit is sized properly and wired correctly.

Always read and follow the manufacturer's directions carefully before using a portable or standby generator.



## RESPONDING TO AN ELECTRICAL EMERGENCY

If an electrical emergency occurs, it's important to know how to respond.

### Electrical contact accidents

- If someone comes in contact with an energized wire or power line, do not touch the victim until you're sure the current has been turned off—you could become part of the circuit and be injured or killed. Unplug the device or cut power at the service panel first.
- When you're sure the power has been turned off, call for emergency assistance. If the victim isn't breathing, administer CPR until help arrives. If the victim is in shock, loosen clothing and keep him or her horizontal and warm. Burns should be treated only by medical professionals.
- Always seek medical help for an electrical contact accident, no matter how minor it appears. Electricity burns from the inside out, so injuries might not be visible. In addition, the heart can be affected several hours later.

### Electrical fires

- If possible, unplug the device or shut off the power at the main service panel.
- Never use water on an electrical fire—use a multipurpose fire extinguisher.
- When calling 911, be sure to tell the dispatcher it's an electrical fire.

### Downed power lines

- Report downed power lines to your electric company immediately.
- Never let anyone touch or drive over a downed line—even experienced utility personnel can't tell if a line is energized just by looking at it.
- Avoid touching anything a downed line is contacting, especially metal fences and equipment. Remember that the area around the downed line, including the soil, equipment or other objects, could also be energized.
- If a downed line comes in contact with a vehicle or farm equipment, instruct the driver to stay in the vehicle until help arrives. If there is an immediate danger of a vehicle fire, the driver should jump out of the vehicle, landing with both feet together and avoiding touching both the car and the ground at the same time. The driver should then shuffle away from the vehicle without raising his or her feet.



## SAFETY CHECKLIST

The checklist below can help you determine if your farm has any “red flags” that require follow up.

Yes	No	If an answer is no, have a qualified electrician inspect the problem area.
		Did a qualified electrician install the electrical system?
		Has the electrical system been professionally inspected within the past 10 years?
		Does each building have a single electrical service entrance?
		Is there at least three feet of clearance in front of all electrical panels, and can all panel doors be opened at least 90 degrees?
		Is the service entrance at each building equipped with a grounding electrode?
		Are all enclosures, thermostats, switches, receptacle boxes and covers water-tight, dust-tight and made of corrosion-resistant materials?
		Are all cables and cable fittings of a type designed for use in a wet or damp environment?
		Is all conduit nonmetallic and surface-mounted?
		Is all metallic equipment properly grounded?
		Are all grounding and neutral conductors electrically separated except in the main disconnect panel?
		Are all light fixtures made of corrosion-resistant material and equipped with shatterproof covers or globes with proper gaskets?
		Do all cables and conduits enter boxes and enclosures from the side or bottom wherever possible?
		Are all motors totally enclosed and rated for farm service?
		Are all electrically heated waterers serviced with a cable or conduit equipped with an equipment grounding conductor?
		Are all metallic building components within eight feet of the ground or floor bonded to the electrical grounding system?
		Do family members and all hired farm workers know where and how to disconnect power in case of an electrical emergency?
		Are all agricultural buildings equipped with a lightning protection system?
		Is there a minimum 18-foot clearance between the tops of grain bins, buildings and any overhead power lines?
		Is there adequate clearance to move tall equipment under power lines?

For more information call your Alliant Energy agribusiness representative or 1-800-ALLIANT (255-4268).





**Questions:**

Call your Alliant Energy  
agribusiness representative  
or 1-800-ALLIANT (255-4268).

**Visit our Web site**

[www.alliantenergy.com/ag](http://www.alliantenergy.com/ag)



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