

Overhead Power Lines and Grain-Handling Equipment

Many farmers have their own grain-handling and storage systems. These systems increase economic potential of farms by allowing direct marketing control. However, there are hazards associated with maintaining grain systems. One frequently overlooked hazard is overhead power lines. The risk of electrocution around grain-handling and storage areas, particularly with the use of portable augers, is a serious threat. This danger increases in systems using frequently moved augers. An auger coming in contact with or near an overhead power line can be deadly. The hazard of electrocution around grain-storage areas, particularly those utilizing portable augers, poses a serious threat to the operator.

Rules Governing Proximity of Overhead Lines

There are two sets of guidelines to consult for placement of overhead power lines in relation to grain-handling systems. The first is the National Electrical Safety Code (NESC). It applies to the primary electrical supply equipment and wires ahead of the transformer location serving the farm. The second is the National Electric Code (NEC), which is concerned with electrical wiring from the meter location to the loads.

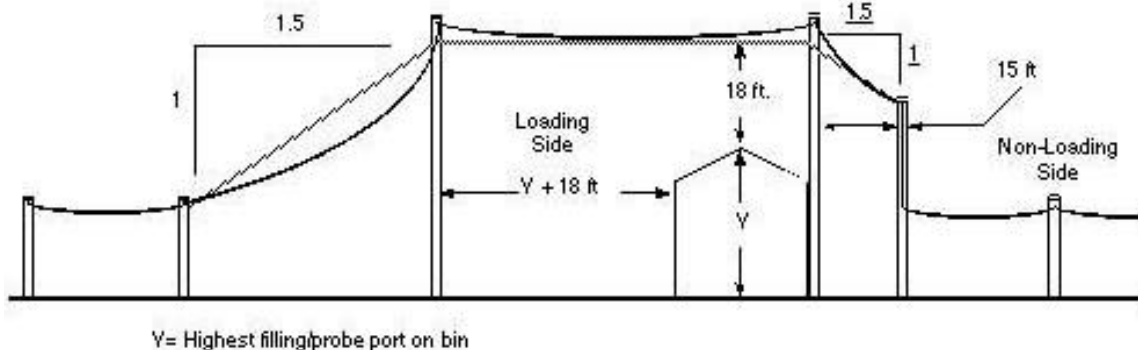


Figure 1. Placement of power lines using portable grain equipment. (NESC)

NESC

The NESC is the standard the power supplier should adhere to when placing service at the site. It is effective up to and including the transformer supplying the site. Two different sections apply to grain handling systems: one to fixed systems (grain legs and other permanent equipment) and the other to portable grain-handling systems (moving augers). The guidelines listed here deal with both types of systems. Further concerns should be directed to your local power supplier.

The primary differentiation between fixed and portable systems is in regulations involving magnitude of clearances. Figure 1 shows minimum clearance of lines around a bin where portable grain-handling systems are used. A distance of 18 feet (5.5 meters) must be maintained above the highest port of the bin.

Furthermore, on the loading side of the bin, the line must maintain this height for a distance of 18 ft. (5.5 m) plus the height of the bin. The line may then be sloped down at a ratio of 1:1.5, or 67 percent slope, to its regular height. On the non-loading side of the bin, the line may slope for a distance of 15 ft. (4.6 m) from the edge of the bin, then lower vertically to its original height. Figure 2 is an overhead view of the layout.

For systems with fixed grain-handling equipment, a power line serving the transformer and passing over a roof or other solid structure not easily accessible to people must have a minimum vertical clearance of 12.5 ft. (3.8 m) or more. If the roof has easy access (as in the case of a grain bin), the conductor must have a minimum clearance of 18 ft. (5.5 m) above the highest probe port. A horizontal clearance of 7.5 ft. (2.3 m) must be maintained.

Whether a fixed or portable system is used, Section 232 states that any lines over a path or roadway traversed by cultivation equipment must be at least 18.5 ft. (5.6 m) above that area. This ensures that contact between lines and large equipment, such as a combine or tractor, will be kept to a minimum. Contacting overhead lines with other machinery can be just as deadly as with grain equipment.

NEC

The NEC is the standard that applies to farm distribution and wiring after the meter. NEC specifications listed here are applicable when maximum voltage does not exceed 600 volts. The NEC does not differentiate between fixed and portable equipment.

A horizontal clearance of 3 ft. (0.9 m) must be maintained between equipment and insulated conductors. The minimum vertical clearance of 18 ft. (5.5 m) above roadways used for forest, orchard, grazing or cultivation equipment must be maintained to reduce risk of contact with tall equipment. An 8-foot (2.4 m) clearance is required above rooflines that are easily accessible to people (such as a grain bin roof). Contact your local electrical inspector, power supplier or similar authorities for further interpretation of these specifications.

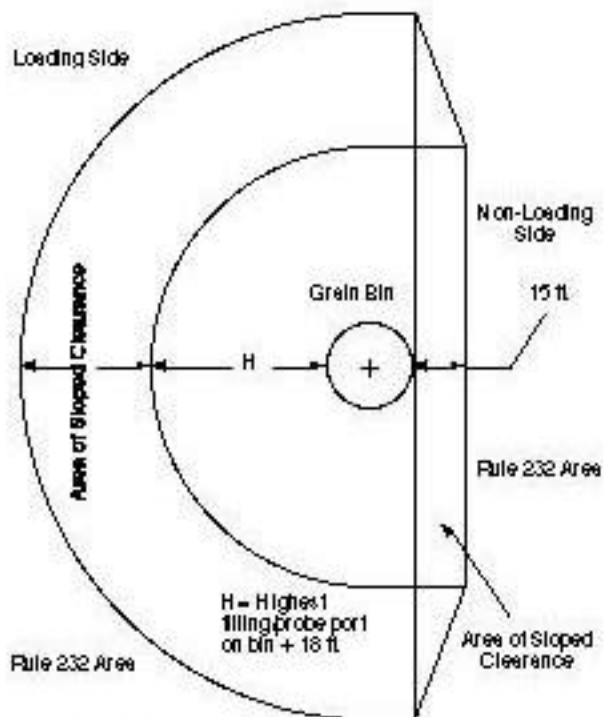


Figure 2. Side boundaries. (NESC)

Suggestions for Improved Safety

A dangerous situation exists if the above conditions are not currently being met. Extreme caution should always be exercised when moving grain augers near power lines. Lower the auger to transport level to ensure contact will not take place. It is also wise to reposition the lines to their proper height or have the electrical service attached to the bin from a non-loading side.

Operators who design or expand a grain-handling system may want to explore the option of placing the lines underground. The hazard of contacting any power lines with tall equipment is then eliminated. Underground lines are the safest means to supply electricity to a site where portable augers are in use.

A new option not previously available is an elevator that uses tractor power to raise and lower the auger. These new augers are raised and lowered by a hydraulic cylinder. A farmer may follow the safe practice of lowering the auger if there is an easy way to do it. Tractor power is usually available and may be used to raise and lower the auger.

All augers currently being manufactured should have a warning label affixed, which should resemble the one displayed here. Please read all operating instructions, particularly the warnings and other safety notices regarding proper operation.