IDAHO POWER®
An IDACORP Company

Working With Your Agricultural Operation

Idaho Power strives to provide reliable, responsible, fair-priced energy to more than 489,000 customers within southwestern Idaho and eastern Oregon.

Idaho Power developed this brochure to address common questions asked by farmers and ranchers about agricultural operations and the siting, construction, operations and maintenance of a transmission line.

Our Commitment

Idaho Power is committed to working with farmers and ranchers during the planning, design, construction, operation and maintenance of a transmission line to reduce impacts to agricultural lands and ensure the line is mutually acceptable. Once a transmission line route is identified, we work individually with farmers to understand current and future on-site operations. Idaho Power also coordinates the location of transmission line structures, such as towers and access roads, to reduce potential impacts to farmlands.

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Idaho Power conforms to all state and federal siting requirements when siting the line. Additionally, we follow all applicable safety codes and standards to ensure our system operates safely and reliably.

Transmission Lines and Agricultural Practices

The following information highlights some of the key issues and concerns heard from farmers and ranchers related to the siting, construction, operation and maintenance of a transmission line.

Aerial Spraying

Aerial spraying is an important tool for agricultural operators, and we understand there are concerns transmission lines could hinder or affect crop dusters' flight paths. Aerial operators must fly at extremely low altitudes to apply their pesticides and fertilizers effectively. We met with crop dusters to listen to their suggestions on how we can work together to locate and design transmission line routes.

Harvesting

Transmission tower heights generally range from 100 to 190 feet with a minimum ground clearance of about 40 feet. With an average span of 1,300 feet between towers, there is space for farm equipment to operate underneath transmission line wires. When needed, Idaho Power will often vary the location or height of towers or the span length between structures to accommodate plowing and harvesting. The area under the transmission line (including the easement) and adjacent to the footprint can be used for agriculture, grazing and other purposes. The only area no longer usable is the base under a tower (typically 40 by 40 feet). Tower locations are determined with input from the landowner to minimize potential disruption to agricultural practices.

Grazing

Many transmission lines go over land used for grazing. Tower footprints rarely affect grazing operations. In the history of Idaho Power, incidents of adverse impacts on cattle, or their behavior when grazing on land that has a transmission line crossing it, have been extremely rare.

Irrigation

As with harvesting, Idaho Power can often vary the location and design of a transmission line to accommodate irrigation system operations. Towers can be sited to avoid irrigation pivots and located outside of a pivot irrigation system's spray area. A pivot system can spray under transmission lines to irrigate crops located underneath and adjacent to the line.

Many irrigation systems can be used safely near a transmission line. Spray-type irrigation systems and flood systems typically do not pose a hazard when located near transmission lines. However, the water stream from gun-type irrigation systems must avoid direct contact with transmission line structures or wires.

Pivot section truss rods are tied together and provide a grounding path at the pivot point for any possible electrical charge. However; corrosion, dirt buildup or other impediments can cause the natural grounding built into the machines to fail, which can create a shock.

In planning transmission lines, Idaho Power works to avoid agricultural operations whenever possible. However, there are occasions when a line must be routed through these areas.

Prior to construction of a transmission line, Idaho Power discusses with the property owner the type of current or future irrigation system being used to address potential safety issues.

Global Positioning Systems (GPS)

According to a study by the Institute of Electronics and Electrical Engineers, "Use of Global Positioning System (GPS) Receivers Under Power-Line Conductors" published in the *IEEE Transactions On Power* (October 2002), power line conductors are unlikely to cause signal degradation to GPS signals. This is primarily because a GPS receiver relies on a dispersed constellation of satellites—at least four and often more. Specifically, it was noted there was no loss of satellite signals as a GPS receiver moved across a power line easement.

Health and Safety

Working Near Transmission Lines
Farmers should operate with care when using farm machinery and irrigation equipment near transmission lines. For safety reasons, Idaho Power recommends land owners use caution on easement lands to eliminate the possibility of any object making contact with the transmission line, such as a crane or other tall equipment.

Federal and state laws require farmers to stay a safe distance of 10 vertical feet or more away from overhead power lines of 50,000 volts or less while working. This 10-foot clearance not only applies to people, but also to anything workers may be carrying or operating. For higher voltages, farmers should keep a wider distance and plan the location of heavy equipment, such as cranes, in consultation with Idaho Power.

Electric and Magnetic Fields
Wherever electricity is used, it's accompanied by electric and magnetic fields (EMFs). EMFs are a natural and unavoidable occurrence in the transmission, distribution and use of electricity. The fields are invisible lines of force that exist when electricity flows through a conductor, such as house wiring, electric transmission and distribution lines, appliances and motors.

Idaho Power will work with farmers and crop dusters to understand aerial operations (e.g. crop dusting) in agricultural areas and reduce impacts to aerial spraying.

Health Issues
Idaho Power received concerns from farmers related to the possible health risks of working near high-voltage transmission lines. Intermittent exposure to EMF-related transmission lines is similar to exposure experienced by various industry workers that use power tools. Depending on the type of line and its current, magnetic fields from power lines at a distance of 100 feet become less than those produced by the typical residence.

Since the early 1970s, extensive research has been conducted to determine if EMFs pose health risks. The majority of evidence supports that EMFs are not detrimental to human or animal health or food crops. For more information about electric and magnetic fields, please visit www.idahopower.com/pdfs/Safety/EMFbrochure.pdf.

Irrigation Equipment
Research also shows EMFs do not interfere with pivot irrigation systems. The Institute of Electronics and Electrical Engineers conducted a study, "Electromagnetic Compatibility of High Voltage Transmission Lines and the Guidance of Center Pivot Irrigation Units With Cornering Systems," published in the *IEEE Transactions on Power Delivery* (October 1998), to determine if electromagnetic fields of high-voltage transmission lines can interfere with electromagnetically guided cornering systems associated with some center-pivot irrigation units. Using electromagnetic susceptibility tests, it was found that 60 hertz (Hz) magnetic fields of more than approximately 500 milliGauss (mG) are required to cause interference with the operation of one system. This level is significantly higher than those found near most high-voltage transmission lines.

For more information and for safety assistance around power lines, call 1-800-488-6151.

Idaho Power is committed to addressing EMF concerns with our customers. We will continue to monitor scientific and regulatory developments surrounding EMF issues.

Stray Voltage
Stray voltage is different than EMF. Stray voltage can develop on the grounded neutral system of either a farm wiring or utility distribution system. If an animal touches grounded metal equipment under the right conditions, voltage on the grounded neutral system can cause a small current to flow through the animal into the ground. It may be a result of damaged or improper wiring on the farm or a nearby farm, or on Idaho Power's electricity lines. Under normal conditions, stray voltage can be kept at levels where livestock health, behavior and production are not affected.

Possible Hazards

Idaho Power asks farmers to be cautious when performing work near transmission lines. Since transmission lines are not insulated, unintentional interference could potentially disrupt power or cause electrical flashes.

For safety reasons, please be aware of these hazards:
- Tall construction or farming equipment operating near lines
- Hay stacks or compost piles
- Debris piled under or near lines
- Smoke from field burning

Right-of-Way

Idaho Power seeks to acquire rights-of-way for transmission lines through mutual agreements with property owners for the use of their property. Once the location of the transmission line has been determined, and the necessary local, state and federal approval processes are under way, Idaho Power begins coordinating with property owners to acquire rights-of-way. For more information, refer to Idaho Power's *Working with Landowners* brochure located at www.idahopower.com/aboutus/planningforfuture/projectnews/default.cfm.

Compensation

Idaho Power strives to be a community steward and makes every effort to provide fair compensation to property owners for transmission line easements. Easement compensation is made through a one-time payment to the property owner in return for the grant of access to build, operate and maintain the power line. Our experienced right-of-way agents work with each affected property owner to negotiate easement compensation, terms and conditions in a mutually agreeable package. For more information, refer to Idaho Power's *Working with Landowners* brochure.

Operations and Maintenance

Landowners can restrict right-of-way access on their property; however, an easement allows Idaho Power employees to access the line at any time to operate and maintain it. Fences, locks or other access restrictions can be used by property owners along acquired rights-of-way. Predetermined routes are used to enter the facilities for inspections and emergency maintenance.

Idaho Power inspects transmission lines twice a year and substations are inspected monthly. Safety inspections are performed by an inspector on foot in a four-wheel drive vehicle or from the air using a helicopter. Maintenance requires access to the line using specialized equipment to allow safe and efficient repair of the facility. Emergency maintenance may require access on an as-needed basis to promptly repair or replace any damaged or missing equipment.

Engineering

Idaho Power has a responsibility to design our systems to operate safely. The National Electric Safety Code (NESC) is used to develop the appropriate right-of-way width based on a number of factors, such as tower type and height, conductor type, conductor tensions, span length between towers and weather conditions.

A variety of transmission line structure designs may be used for a 500 kV project. The structures may be a combination of steel lattice and tubular towers. Typical design details include:

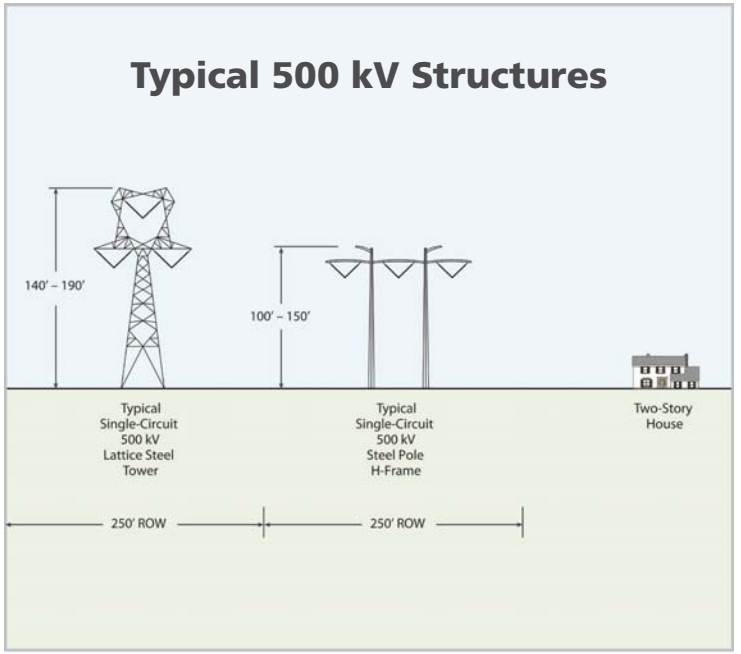
Tower height:
100 to 190 feet

Tower footprint:
40 by 40 feet

Line span:
1,200 to 1,500 feet

Ground clearance:
Minimum of 40 feet

Right-of-way width:
250 feet



Note: Graphic of typical structure. Heights may vary due to terrain and engineering constraints. Other tower types may be used based on local circumstances.

We encourage you to visit our Web site for more information about Idaho Power. Or, feel free to visit one of several resource sites including two of our current 500 kV projects:

Resources on the Web

Idaho Power Company:
www.idahopower.com

Boardman to Hemingway Transmission Project:
www.boardmantohemingway.com

Gateway West Transmission Project:
www.gatewaywestproject.com

Idaho Public Utilities Commission:
www.puc.state.id.us

Oregon Public Utility Commission:
www.puc.state.or.us

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