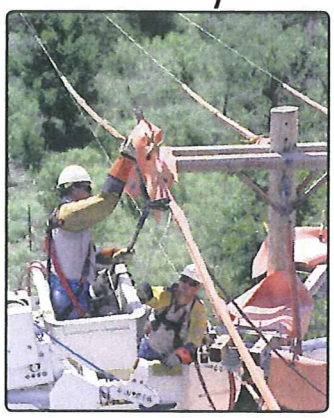
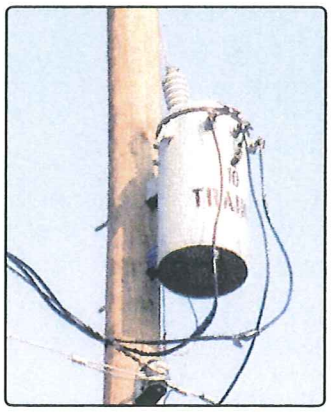
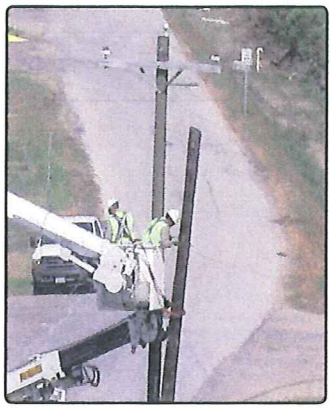
Public Safety

Electricity's Journey

Anatomy of a Distribution System Explored







We use electricity multiple times every day, but where does it come from and how does it get to your wall outlet? To help you stay safe around electricity, it's important to understand electricity's journey, what equipment is used to deliver it and the potential safety issues posed along the way.

Distribution System 101

After electricity is generated at a power plant, it is transmitted to your city and town. Then, it travels through the distribution system before arriving at your home or business.

Similar to the transmission system, these smaller distribution wires are held up by distribution poles or buried underground.

These poles are typically 50-feet tall and most are made of wood. While the distribution poles and wires appear harmless, they still must be treated carefully and with safety in mind. Even the amount of electricity delivered to your home can cause serious injury if mishandled.

What's on an Electric Power Pole?

- **Primary wires** are on top of the pole and usually carry 12,000 volts of electricity from a substation.
- A **crossarm** holds the wires up on the pole.
- **Insulators** hold the wires in place and protect the rest of the pole and equipment from having electricity run through it.
- **Lightning arrestors** protect the pole and equipment from lightning strikes.
- **Cutouts** act like a fuse and open when there is a problem with the line or a section of it.
- A **transformer** takes the electricity in the primary wire and reduces it to a lower voltage.
- The **neutral wire** is below the transformer and acts as a line back to the substation and balances out the amount of electricity or load on the system.
- The **secondary wire** holds the lower voltage electricity after it passes through the transformer.
- **Telephone and cable wires** are typically the lowest wires.
- **Grounds** are made of copper and take electricity on the pole into the earth.

Distribution Safety Tips

- Electricity never shuts off, so if a wire breaks or falls down, electricity may still be present and looking for a path to ground.
- Avoid all fallen wires and presume they have electricity running through them. Call 911 and your local power company immediately to report fallen wires.
- Do not touch anything or anyone that a fallen line may be touching. Objects can become energized just by contacting a downed power line.
- Electric wires are not insulated like power cords for home appliances. What may appear to be some form of insulation is actually weatherproofing material and does not make the line safe to touch.
- Always be aware of overhead lines. Keep ladders, TV antennas, pool and gardening tools, satellite dishes and any other equipment a minimum of 10 ft. away from all wires.
- Contact with underground lines can be deadly as well. Always call 811 before any digging project.
- If your vehicle comes in contact with a utility pole or wire, do not get out of the car. Call 911 and alert others to stay away from your vehicle.
- Copper theft can kill you. Do not attempt to steal copper from electric lines or facilities.

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