Richland Electric Cooperative
Your Touchstone Energy® Cooperative

Outage management technologies IMPROVE RELIABILITY

"The only things certain in life are death and taxes," as the old saying goes. Well, we can add another to the list: power outages. An outage can range from annoying to dangerous, depending upon its timing and length.

Richland Electric Cooperative's (REC) primary goal is to deliver the highest possible quality of electric service at the lowest possible price. Perhaps the key measure of quality in the eyes of members is the number of times their lights blink or go out.

Let's talk a bit about how the grid is designed as a backdrop to how technology is improving reliability by reducing blinks and outages. Along the power lines that bring electricity to your home, REC installs protective devices in the form of fuses and reclosers (high-voltage circuit breakers). Fuses and reclosers serve the same purpose as the fuses and circuit breakers in your home.

A fuse is a one-shot device. When a fault occurs, the fuse blows and everyone downstream from it loses power. Reclosers are multi-shot devices, meaning they can operate a certain number of times before they stay open and an outage occurs. A common setting is what's known as a triple-shot. Here's how that works. A tree limb contacts the power lines and creates a fault. The recloser senses it and opens, creating the first blink.

Here's where a recloser differs from your home circuit breaker. It waits a certain amount of a time (typically a few seconds), then recloses to try and complete the circuit. If the fault is still there, it opens again. This creates the second blink. Triple-shot settings allow the device to reclose a third time and if the fault is still there, it stays open and the members downstream experience a power outage.

Blinks are a nuisance, but they eliminate a lot of extended outages by protecting wires and equipment from serious damage.

So, what kind of technology is improving service reliability? The Smart Grid is spawning an amazing array of equipment and software that are already improving reliability. When combined with field construction practices, like building multiple ways to feed power loads and the deployment of advanced metering systems (AMI), the future of reliability is bright—pun intended.

Electric co-ops are starting to use more of what are called Intelligent Electronic Devices. "Intelligent" basically means a co-op can program the device to behave a certain way when a

specific event occurs. It also means the co-op can remotely command the device to take an action, either preprogrammed or ad hoc.

Eventually, there will be a power outage despite the best efforts of REC. That is where AMI and outage management systems (OMS) earn their keep. The basic element of an AMI is a meter that can communicate with your electric co-op. The OMS maps system data and meter locations into a piece of software that models the electric grid. When a device on the grid reports loss of power, the OMS runs calculations to determine the exact location of the fault and the number of members impacted.

The end result of all this technology is the minimization of outages and their length.

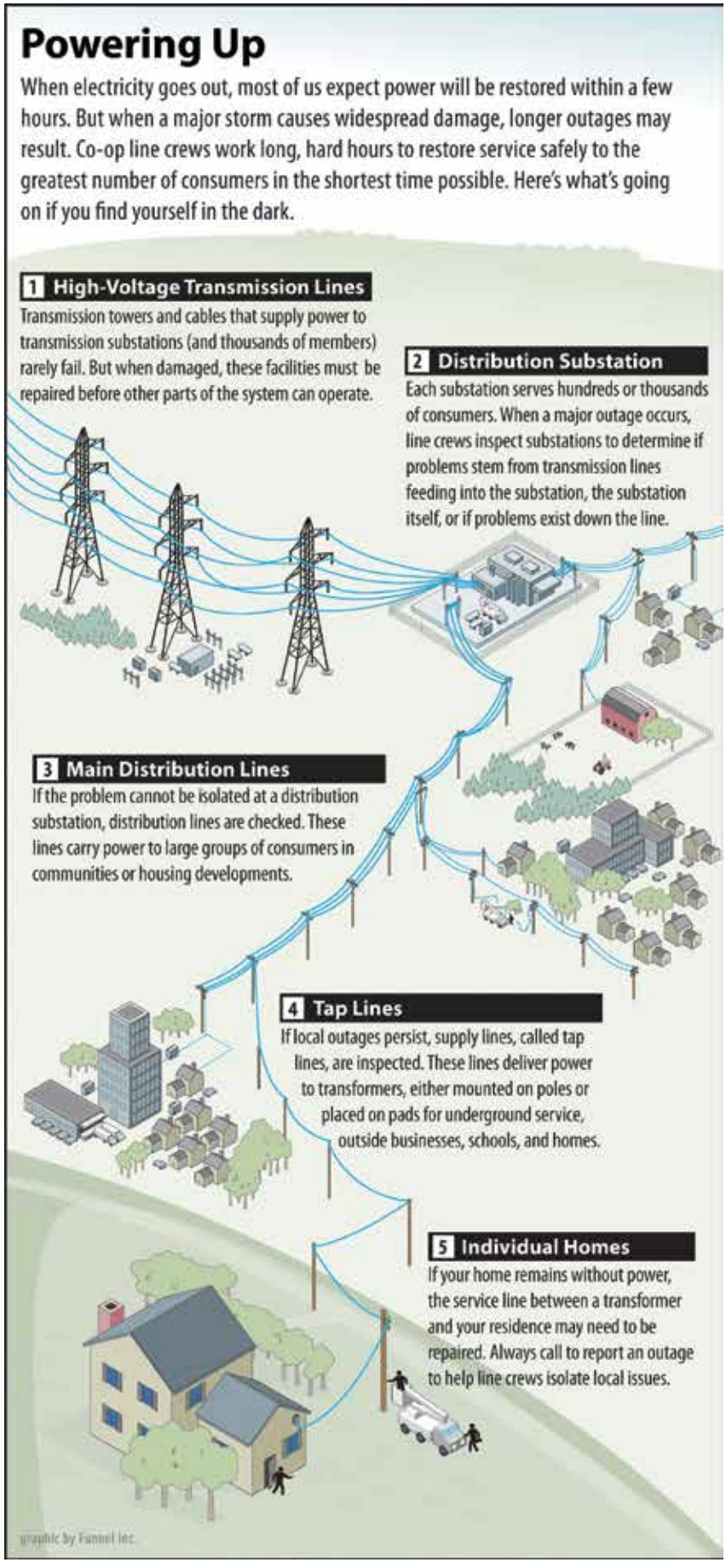
Now, the whole suite of systems your co-op uses comes into play. The co-op dispatcher can call out or redirect a crew to the exact location of the problem. A map of the outage and number of impacted members is generated and member service reps are notified that an outage is in progress. For members who have signed up for it, they might receive a text stating there's an outage and another when power is restored.

The end result of all this technology is the minimization of outages and their length, plus more availability of up-to-date information for the consumer.

Mother Nature is a tough opponent, and it's impossible to eliminate outages and blinks altogether. But with the way technology is advancing, we can expect to see some remarkable improvements.

Contact REC to learn more about outage notification systems.

By Tom Tate, who writes on cooperative issues for the National Rural Electric Cooperative Association, the Arlington, Va.-based service arm of the nation's 900-plus consumer-owned, not-for-profit electric cooperatives.



STAY SAFE THROUGH STORM RECOVERY

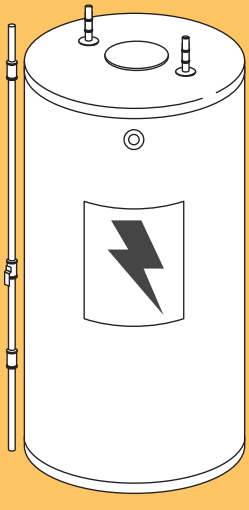
Storms can cause a great deal of destruction. The National Oceanic and Atmospheric Administration (NOAA) reported that lightning resulted in 27 fatalities and 130 injuries in 2015. In addition, tornadoes caused 36 fatalities and 924 injuries, while high wind resulted in 41 deaths and 150 injuries. Flash flooding accounted for 129 deaths and 42 injuries. Remember that just because the storm has ended, it does not mean that there is no longer any danger. Safe Electricity encourages you to keep these safety tips in mind after a storm:

- After a storm, it is best to assume all downed lines are energized and potentially dangerous. Stay far away from all power lines and any objects that may be in contact with those lines. Remember, even if a downed line is not sparking, it can still be carrying electricity and be dangerous.
- If at all possible, remain at home and off the roadways to allow emergency responders and utility crews easy access to damaged areas or injured individuals.
- Never drive through a flooded roadway. There is no way to predict how deep the water may be.
- Never drive over downed lines, which easily tangle in car wheels and cause additional damage.
- If your car makes contact with a downed line, stay in your vehicle. Wait for utility professionals to make sure the power line is de-energized before exiting. If you must exit the car because it is on fire, jump clear of it with your feet together and without touching the vehicle and ground at the same time. With your feet together, shuffle or "bunny hop" to safety.
- Never enter a flooded basement if electrical outlets are under water. The water could be energized.
- When cleaning up outdoors after a storm, do not use electrical equipment when it's raining or the ground is wet.
- Take care when using a generator after power has been lost. Always run generators outside the home, in unenclosed areas. Portable generators should never be plugged directly into a home outlet or electrical system. Use a heavy-duty, outdoor-rated extension cord to plug appliances into an outlet on the generator for power.
- Do not use electrical equipment that has been water damaged. Have it inspected and approved by a professional first.

For more information on storm safety, please visit SafeElectricity.org.

The Hidden Battery

Using Your Electric Water Heater for Heating Storage



How it Works

1

Electric water heater:
Controllable, high-efficiency electric water heaters are in homes.

2

During times of high demand:
Co-op cuts power to water heaters.

3

When demand drops:
Water heaters are turned back on to run during the night and provide warm water for the next day.

Benefits

- Co-ops avoid peak pricing.
- Members use power when it's cheaper.
- Helps avert need for new power plants.

Water heater storage
Electric water heaters are essentially pre-installed thermal batteries that can be used to manage the storage of heat energy, allowing the co-op to take heavy energy loads off-line during peak periods. This saves energy and money for members.

Contact your local electric cooperative to learn more about load management programs.

AMERICA'S ELECTRIC COOPERATIVES

RAINY DAY IN JUNE

I remember one June morning so many years ago. When I woke up at 5:30, I heard the splash of rain drops on the window of my second floor bedroom, and I saw the water trickle down to the windowsill. The morning was gray and dreary. The rain had begun with no announcement. No booming thunder. No flashes of lightning. No tree shaking wind.

I dressed and made my way down the stairs where I pulled on an old tattered rain coat and my equally well-worn barn cap. Soon I was slogging my way along the half-mile lane to where the milk cows were waiting for me in the night pasture. Fanny, our farm dog, accompanied me, seeming to enjoy the gentle rain that was creating little rivulets, and turning a once dusty cattle trail into mud. I plodded along, my head down with rainwater dripping from my cap and running from the bottom of my raincoat.

Arriving at where the cattle were waiting, Fanny, with a bark or two, rounded them up and cows began the walk home, in single file, with the rain dripping from their black and white coats. We had about 15 cows at the time and a half dozen or so young stock. They seemed not too bothered from the rain, which had become heavier as the time passed.

Pa opened the barn door when we arrived and the milk cows filed in, taking their places, always the same stalls as they had been trained to do. The young stock continued on past the barn door. They would wait in the barnyard until the cows were milked, and then the entire herd would walk back to the pasture where they would spend the day, grazing, chewing their cuds, and resting. Not too much bothered by the rain.

The rain increased in intensity. Not a downpour, but a steady, soaking, earth-loving rain. It rained all day and all night and most of the following morning. On our sandy, always droughty farm, rain was always appreciated. A steady, easy, all-day rain was celebrated. A rainy day was a day when Pa smiled. And if either my brothers or I complained about the rain, Pa would always have the last word, "Never curse the rain."

On rainy days like this in the midst of haying season, we stopped work in the hayfield, of course. When the morning chores were done, and the cows were turned out to pasture—they didn't seem to mind the rain splattering on their backs—we would crawl up into the haymow where the freshly cut hay was stored. And there we would rest on the hay that smelled of sweet clover and alfalfa, and listened to the drumming of the raindrops on the barn roof. We'd listen to Pa's stories of rainy days that he remembered—but mostly we'd enjoy a day of rest, and celebrate the rain.

Excerpted from Jerry's new book, which he has written with his daughter, Susan Apps-Bodilly: OLD FARM COUNTRY COOKBOOK. Available later this summer from Wisconsin Historical Society Press.

Go to www.jerryapps.com for more information about Jerry's writing and television work.