

RE

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Road Hazard

Crews battle a surge in distracted driving



Fighting Fraud

Is your co-op vulnerable to internal theft? p.26

Touchstone at 20

The co-op brand hits a milestone p.28



DRAWING A LINE

New co-op strategies for avoiding animal outages

BY REED KARAIM

East Kentucky Power Cooperative, a G&T serving 16 co-ops in the eastern and central part of the state, has 2,852 miles of high-voltage lines. So it's not surprising that Line Supervisor Anthony Daniel has seen outages caused by just about every type of flying and crawling creature you can imagine.

But nothing, he says, was quite as strange as the “flying winter snake.”

Snakes, of course, go into a hibernation-like state in the cold (technically known as “brumation”). But in the dead of winter several years ago, East Kentucky Power found itself dealing with a curious substation outage: Despite the cold, a snake had somehow made its way into a single-phase transformer.

“There was snow on the ground,” he recalls. “Nobody could believe there was a snake in there that time of year.”

Co-op crews investigated and found that a farmer had been moving bales of hay in an adjacent field. They surmised that his work had uncovered the slumbering reptile, which had then become easy prey for a raptor.

“Laying there, a hawk picked it up,” Daniel says. “It then flew over our substation and dropped it.”

A MULTIMILLION-DOLLAR PROBLEM

Hawks bombing substations with sleeping reptiles may not be a common problem, but outages caused by animals have been a challenge for power utilities since the earliest days of electrification. Everything from curious bears to airborne salmon—once again, dropped by raptors—have caused the power to go out. Two years ago in Kenya, a curious monkey that evaded an anti-pest fence managed to short out the entire country's power grid.

Studies have concluded that animals cause between

7 and 20 percent of all U.S. power outages annually and are likely the second-most-common cause of interruptions after the weather. According to the U.S. Energy Information Administration, about 13 million people across the United States were affected by animal-caused outages in 2015. The estimated annual cost for utilities runs into the tens of millions of dollars.

“You also have your soft costs,” notes Thomas Gwinn, NRECA principal engineer for transmission & distribution. Those include member frustration with the outages or blinks and public concern about the electrification of birds or other creatures.

“It's a sensitive issue,” he says. “People don't want to hear that animals are getting killed on their system.”

Gwinn says nearly all electric co-ops and public power utilities have installed some kind of animal guards to protect their systems, but they are continuing to seek new and innovative solutions to an old problem, including repellent sprays and powders, equipment guards, and even data analytics.

REPELLANTS AND COVERS

Daniel says Eastern Kentucky Power recently began using a product that incorporates plant-derived natural oils. The solution triggers a pheromone reaction in various pests that confuses them and causes them to avoid the area.

Produced by Florida-based ICORP, these “Sniff n' Stop” repellants can be applied through time-release capsules, odorant pads, aerosol sprays, and even paints.

“It's worked pretty well,” Daniel says. “You have to refresh it from time to time, though, especially where it gets exposed to the weather and gets wet.”

The oldest approach to protecting electrical systems

against animal damage is by building physical barriers. Although the basic idea might be unchanged, companies have been releasing new designs intended to improve the effectiveness, ease of use, and safety of such animal guards.

Reliaguard's new GreyEEL conductor covers, for instance, come in eight diameters and work with the company's product guards to eliminate gaps and potential nesting cavities. It also makes melt- and burn-proof guards for equipment like transformers, cut-out switches, and metal cross-arms that meet IEEE Standard 1656-2010 for wildlife protective devices on overhead power distribution systems rated up to 38 kV.

Lehman Electrical Resources offers an innovative solution that combines protective hardware for substations with a site review by a biologist to determine the specific types of wildlife present in a given area.

ANIMAL ANALYTICS

The latest weapon in the war against animal outages is a resource that co-ops are leveraging for a multitude of challenges: big data.

Analyzing system data can help develop a clearer picture of how and where animals are causing outages. NRECA's Gwinn notes that many devices and guards intended to keep animals, squirrels in particular, off of power lines have failed because, despite all the outages they have caused, "we don't have a really good understanding of how animals behave."

Cobb Electric Membership Corporation (EMC), a distribution co-op based in Marietta, Georgia, uses outage analytics software called PwrMetrix from Aerinet Solutions to keep electricity flowing to its 200,000-plus members.

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The software can provide a detailed graphical representation of exactly where and when animal outages happen, along with the creature the crew believes is responsible, says Manish Murudkara, Cobb EMC's supervisor of system protection and reliability.

"About 10 percent of outages are squirrel related," he notes, reflecting the most prevalent animal problem nationwide.

Perhaps more importantly, the software allows a co-op to see the cost of animal-caused and other outages.

"It helps us to focus on what types of outage events cost the utility most," Murudkar says.

That information allows a co-op to make rational decisions about where to prioritize preventive measures and how much investment in a particular area makes sense.

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Cobb EMC has found that vegetation management and animal management are closely correlated, at least on power lines.

“As soon as you take care of the vegetation issues, you will see the outages caused by animals will also be reduced,” he says.

Nearly 170 electric cooperatives nationwide are now using PwrMetrix, and as more data on animal outages is recorded—including species, location, and the types of faults they’re causing—Aerinet hopes the cumulative information, anonymously collected, can be shared to give utilities a bigger picture of the extent of

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the problem and possible solutions.

NRECA’s Gwinn cautions that the quality of any such effort will depend on the quality of the data inputted, and the cause of some outages can be hard to

determine after the fact.

“It can be subjective,” he says, but outage data analytics provides an important opportunity to apply 21st century technology to one of the industry’s oldest and most intractable problems. **RE**

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