NOVEMBER / DECEMBER 2019 • VOL. 77 / NO. 6

# PUBLIC POWER MAGAZINE

AMERICAN PUBLIC POWER ASSOCIATION


# THE SAFETY ISSUE

# THE ACADEMY | AMERICAN PUBLIC POWER ASSOCIATION

# Get the knowledge, skills, and connections to perform at the highest level

**REGISTER NOW**

## Joint Action Conference

January 5 – 7, Palm Springs, California

If you lead a joint action agency or belong to one, this is your forum to meet with colleagues to discuss policy/regulatory issues and governance/management trends. From changing customer preferences to power supply contracting, you'll discover new products and services for your agency at this event.

## Winter Education Institute

February 10 – 14, Savannah, Georgia

The Association's seasonal education institutes allow attendees to focus on a single topic or spend the week in multiple classes for comprehensive training.

Featuring 12 courses on:

- Accounting
- Cost of Service and Retail Rate Design
- Underground Distribution Systems
- Key Accounts Certificate Program

## Legislative Rally

February 24 – 26 | Washington, D.C.

As a public power advocate, you are in the best position to talk to Congress about the direct impact of federal action at the local level. Our coordinated outreach efforts are strengthened because you represent not only your public power community, but also the 49 million Americans served by public power.

## CEO Roundtable

April 5 – 7 | Phoenix, Arizona

This meeting provides a unique opportunity to hear from visionary thinkers and to and exchange ideas with your peers. Collaborative, growth-oriented sessions help you think strategically about the challenges facing our industry and how to better position your utility to succeed.

**PARTICIPATE FROM YOUR OWN OFFICE**

## Webinars

A convenient and cost-effective way to get timely information on key industry topics.

Wireless Pole Attachments Webinar Series

- Legal and Regulatory Update: November 5
- Negotiating, Adopting, and Implementing Agreements: November 17
- Challenges and Opportunities: December 3

Disaster Recovery and Resilience Funding Webinar Series

- Natural Hazard Mitigation Funding Overview: November 13
- Procurement: Pre- & Post-Disaster Leading Practices: December 4
- Disaster Documentation: Best Practices: December 11

*All webinars are recorded in case you are unable to attend the live event

## In-House Trainings

We can bring any of our courses to you, or customize an agenda based on your needs. For details, contact EducationInfo@PublicPower.org or call 202-467-2921.

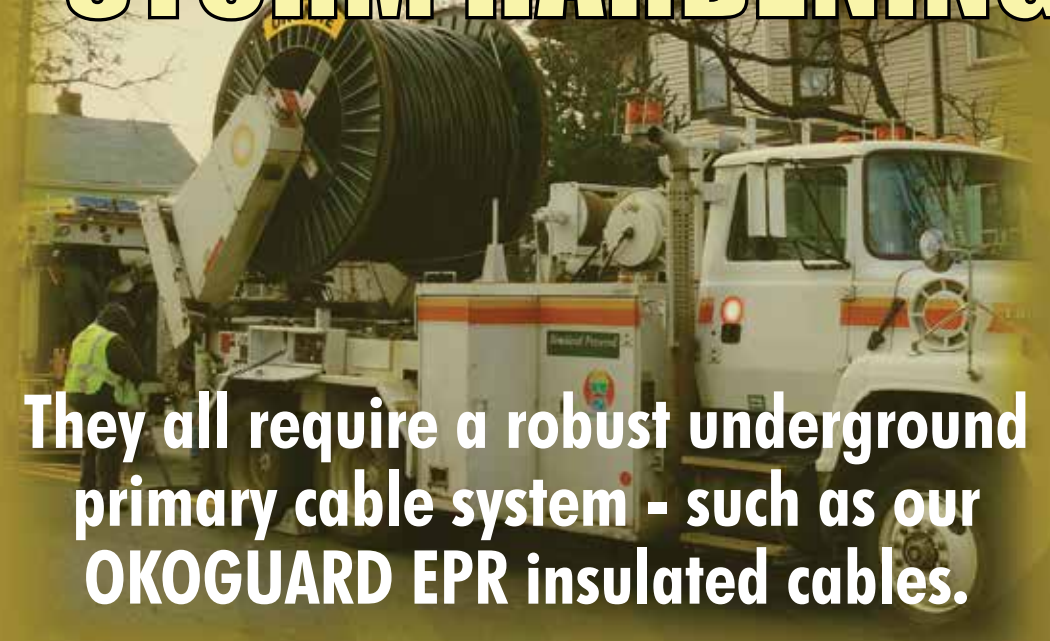
**Learn more and register for all events at www.PublicPower.org/Academy**

AMERICAN PUBLIC POWER ASSOCIATION

# OKOGUARD®

## What do these three major initiatives have in common?

- ✓ "SMART GRID"
- ✓ "RENEWABLE ENERGY"
- ✓ "STORM HARDENING"



**They all require a robust underground primary cable system - such as our OKOGUARD EPR insulated cables.**

## GOING STRONG FOR OVER 50 YEARS!

THE OKONITE COMPANY
102 Hilltop Road, Ramsey, New Jersey 07446
Phone 201.825.0300 • www.okonite.com

*Okonite Cables...A higher Standard!*

MADE IN THE USA
QUALITY CABLES SINCE 1878

PUBLIC POWER MAGAZINE

NOVEMBER – DECEMBER 2019

# THE SAFETY ISSUE






AMERICAN PUBLIC POWER ASSOCIATION
Powering Strong Communities


**EDITORIAL TEAM**

Delia Patterson
Senior VP, Advocacy & Communications & General Counsel

Meena Dayak
Vice President Integrated Media & Communications

Paul Ciampoli
News Director

Susan Partain
Senior Editor & Content Strategist

Robert Thomas
Creative Director

Sharon Winfield
Lead Designer, Digital & Print

Samuel Gonzales
Director, Digital & Social Media

David Blaylock
Senior Manager, Integrated Media & Communications

Tobias Sellier
Director, Media Relations & Communications

Taelor Bentley, Integrated Media & Communications Assistant

**INQUIRIES**

Editorial
News@PublicPower.org
202-467-2900

Subscriptions
Subscriptions@PublicPower.org
202-467-2900

Advertising
EHenson@Naylor.com
352-333-3443

Advertising is managed by Naylor LLC.

*Public Power Magazine* (ISSN 0033-3654) is published six times a year by the American Public Power Association, 2451 Crystal Drive, Suite 1000, Arlington, VA 22202-4804.


Periodical postage paid in Arlington, Va., and additional mailing offices.



**ABOUT THE AMERICAN PUBLIC POWER ASSOCIATION**

The American Public Power Association is the voice of not-for-profit, community-owned utilities that power 2,000 towns and cities nationwide. We advocate before federal government to protect the interests of the more than 49 million customers that public power utilities serve, and the 93,000 people they employ. Our association offers expertise on electricity policy, technology, trends, training, and operations. We empower members to strengthen their communities by providing superior service, engaging citizens, and instilling pride in community-owned power.

Postmaster, send all address changes to:
American Public Power Association
2451 Crystal Drive, Suite 1000
Arlington, VA 22202

# PUBLIC POWER LINES

**SUE KELLY,** PRESIDENT & CEO, AMERICAN PUBLIC POWER ASSOCIATION

# Looking ahead to what's next

As I head into my final two months with the American Public Power Association, I've been thinking about where I have been and what's next.

I'm working to "finish strong" before retiring at the end of December. I continue to visit members and represent public power at conferences and meetings. We on staff are getting the Association's 2020 budget ready for the Executive Committee's review and working on the leadership transition. And on the personal side, as of this publication, I will have just seen my daughter Annie married to her longtime boyfriend — a big moment for her, but also for me, since I spent so many years balancing work and family obligations (with varying degrees of success!) to try and raise her right.

As I have traveled around the country to meet with members this year, I am reminded why I decided to dedicate my career to public power: It's the people. I was first drawn to consumer-owned utilities when I was only two years out of law school, working at a large corporate law firm here in Washington. As I started to learn about the energy industry, I observed that there were different kinds of utilities, and I saw even then that consumer-owned utilities were trying to do the right things for the right reasons. So, I left my corporate law firm to represent consumer-owned utilities for more than 35 years, because I, too, wanted to do the right things for the right reasons. Your dedication to running your utilities — so that everyone in your community benefits from what you do — has been inspiring to me. It also makes visiting your cities and towns fun — I get to glimpse the quality of life you support for your neighbors.

I will watch with great interest how public power takes on the challenges — new and old — facing us. From dealing with cybersecurity threats and climate change to integrating new energy technologies into the public power business model, the coming years will be an exciting and critical time for our industry. I am looking forward to seeing how a whole new generation of employees, customers, and community leaders will take on these challenges and transform the role that public power utilities play in your communities.

I sincerely hope you will continue to work with your communities to make them aware of the benefits of public power. If communities don't appreciate the value their public power utilities provide, eventually they will be at risk of selling them — and as Joni Mitchell sang in Big Yellow Taxi — they won't know what they've got 'til it's gone. While it might not always be "paradise," a public power utility is a great benefit to the community it serves and should not be thoughtlessly paved over to "put up a parking lot."

To inoculate against the loss of community ownership, you need to educate your customers and your city leaders about the value (economic and intrinsic) of having a public power utility. If there is a disconnect between how you are currently operating and where you'd like or need to be, then work with your community to develop a strategic plan that will get you there. I know from seeing it firsthand that you are passionate about public power and doing good work in your communities — you need to share that passion far and wide. Your dedication has inspired me, and I hope you can transfer it to the next generation of public power leaders.

Leading the Association has been an unforgettable experience. I want to thank the Association's Board and Executive Committee for allowing me to serve as your CEO. And thanks to you, our members, for all you have allowed me to do on your behalf, and for your friendship, support, and constructive feedback. I am excited that Joy Ditto is returning in 2020 to take the reins of the Association as president and CEO. She already knows public power well and is well-regarded in Washington energy policy circles. She will do a great job for you.

As for me, I am looking forward in January to taking a much-needed break from technology — what I am calling my "cellphone detox" — and traveling abroad with my husband. I honestly am not sure what I will do after that. I wish I had a dollar for each time I have been asked this year "What are you going to do next?" It feels similar to when I arrived on campus at the University of Missouri for my first semester of college. The first question out of everyone's mouth was, "What's your major?" I thought everyone else had a plan all worked out, while I was still trying to figure out what I wanted to do "when I grew up." As it happened, though, I enjoyed being an "undeclared" arts and sciences major and sampling all the subjects on offer. And compared to some of my peers who seemed to have their plan all worked out on day one, I was one of the few who actually graduated within four years.

So, as I start retirement, I'm looking forward to sampling all life has to offer and again finding out what my major is going to be. Right now, I am still "undeclared!"

**"Leading the Association has been an unforgettable experience."**

**SUE KELLY,** PRESIDENT & CEO,
AMERICAN PUBLIC POWER ASSOCIATION

**WE ALL ARE "IN SAFETY," BECAUSE A CULTURE OF SAFETY MEANS WE ARE LOOKING OUT FOR OUR COMMUNITIES**

# Safety is holistic

**BY MICHAEL HYLAND,** SENIOR VICE PRESIDENT, ENGINEERING SERVICES

Within utilities, safety is a priority not only for those whose work exposes them to potential hazards, but across all employees. I've seen how important it is for the priority mindset to begin with the utility's leadership, who set the stage for a culture of safety that then ripples throughout the utility. I've also seen how lineworkers and other crew members have spoken up and effectively advocated for themselves and their peers when needed, and how much their commitment to working safely impacts the utility's mindset as well.

Far too many of us who've been working in this field for a long time know about the real dangers we face as part of our daily work. We know that utility work can be difficult and puts our employees into potentially hazardous situations. But I'm glad that as a whole, we've been making strides to change this narrative.

Over my years of working in the industry, and in collaborating with peers on keeping the National Electrical Safety Code up to date, I've been glad to see utilities increase their commitment to safety. From investing in protective equipment (see page 40) to implementing a daily safety message at meetings and setting robust standards, utilities have made strides in making sure that their employees can go home at the end of the day.

For public power, having a culture of safety is not just about protecting line crews and other utility employees who might work in hazardous conditions. You also represent our cities and towns — and your priorities and actions in protecting your employees and citizens embody your city's views on safety. We all are "in safety," because a culture of safety means we are looking out for our communities in using electricity safely. This means our customer service and outreach is conducted with safety in mind, including going into schools and sharing regular messages with the community on how to safely use an ever-expanding array of technology that relies on electricity (see page 14).

This issue of Public Power magazine takes a look at safety from many perspectives. For our workforce, public power has helped implement best practices through our Safety Manual (see page 26), and utilities are instilling a culture of safety in the emerging workforce through training and other means (see page 20). And while safety starts with people, technologies (see page 8) and data (see page 30) can help us to recognize and avoid potentially unsafe practices.

We at the American Public Power Association are eager to continue to help make public power utilities safe places to work. Whether by coming together to showcase how we work safely at the annual Public Power Lineworkers Rodeo, or by sharing and benchmarking incidents and near misses in the eSafety Tracker, our hope is to connect public power to better understand how we can work safely. Through each other's experiences, we are all continually learning how we can further reduce the number of injuries that happen each year. Because we can — and should — all return home at the end of the day.


# Get an inside look at MV cable performance.

Kerite's URD medium voltage cable strips more easily, performs more durably, and lasts longer than any competitor cable.

**Free Strip MV Cable**

- The fastest, easiest stripping cable on the market.
- Fewer stripping errors, less particle contamination, more productivity.
- Reduced termination time (50%) and increased cable life.

**Discharge Resistant EPR Cable**

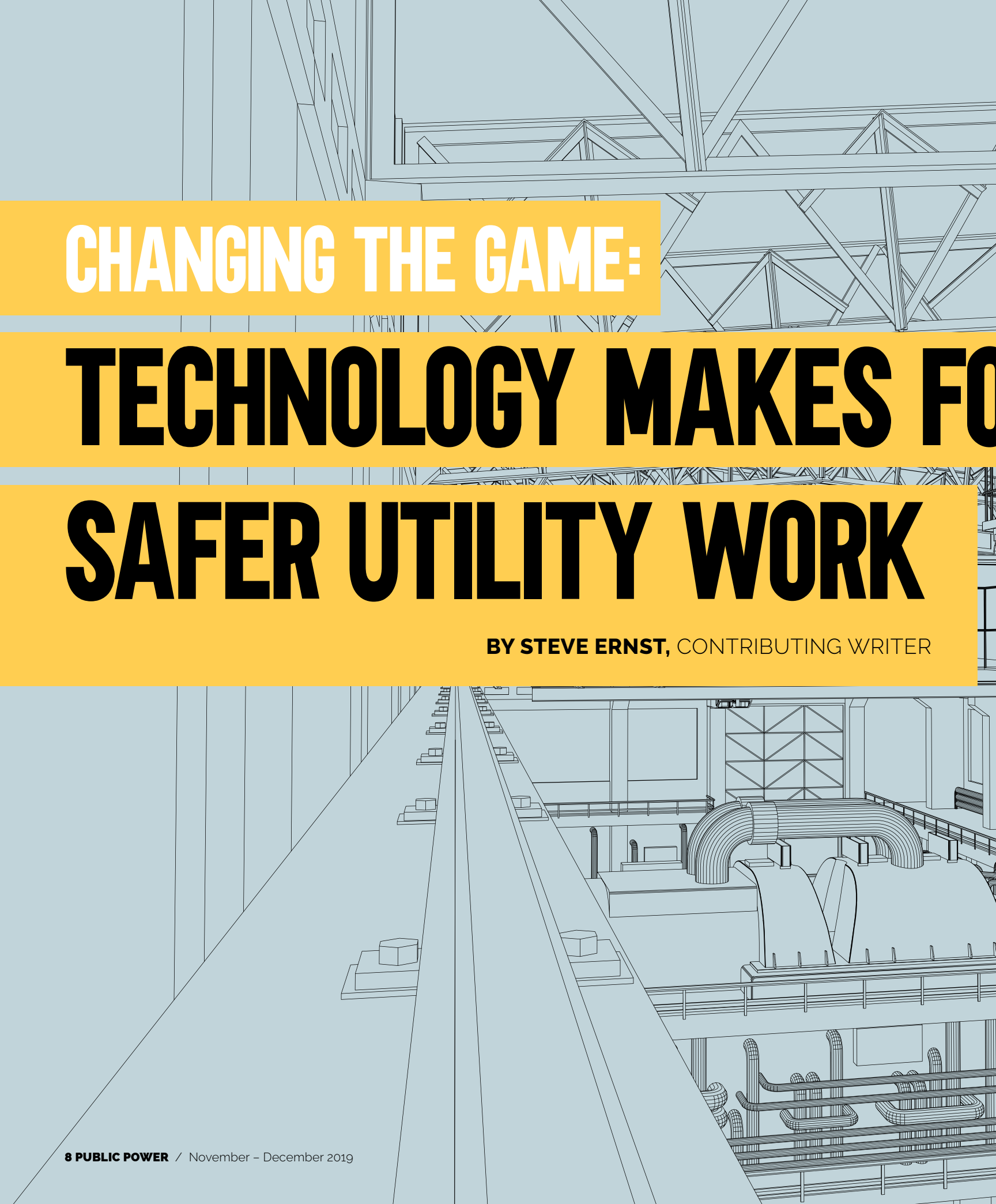
- No treeing failures.
- Immune to voltage discharge – won't degrade like "Discharge Free EPR."
- Water-resistant insulation for performance even with direct water contact.
- Only power cable with life-time warranty

**Get a performance edge in your MV cable selection with Kerite.**
**For proof of performance, visit marmonutility.com**

Kerite

*Your Partner in Reliability*

(603) 673-2040
marmonutility.com



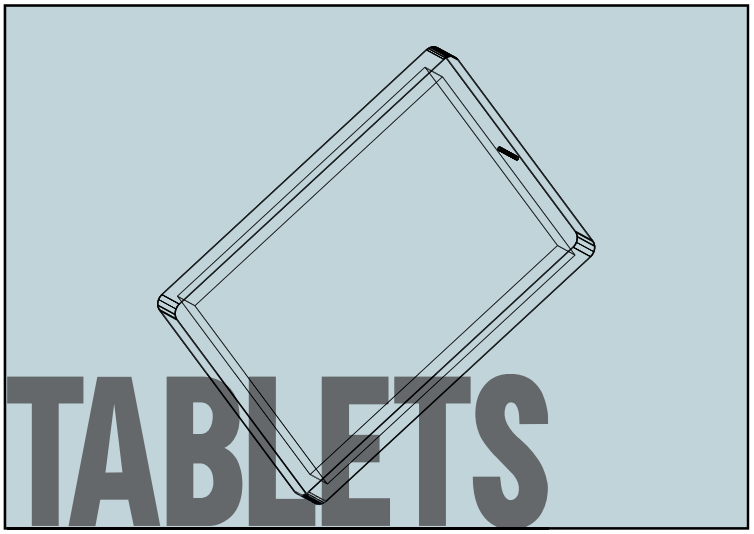
# CHANGING THE GAME:

# TECHNOLOGY MAKES FO

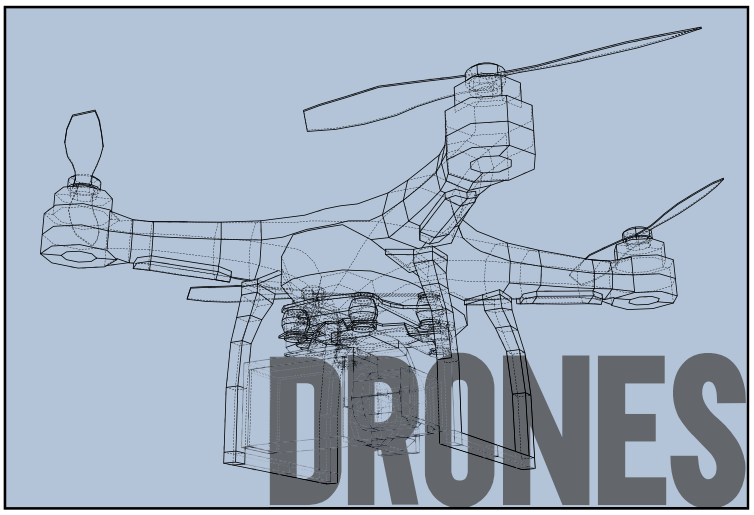
# SAFER UTILITY WORK

**BY STEVE ERNST,** CONTRIBUTING WRITER

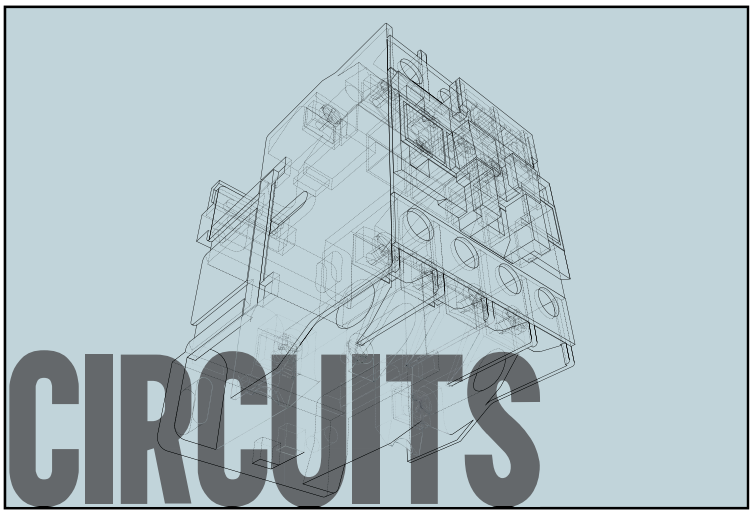
OR



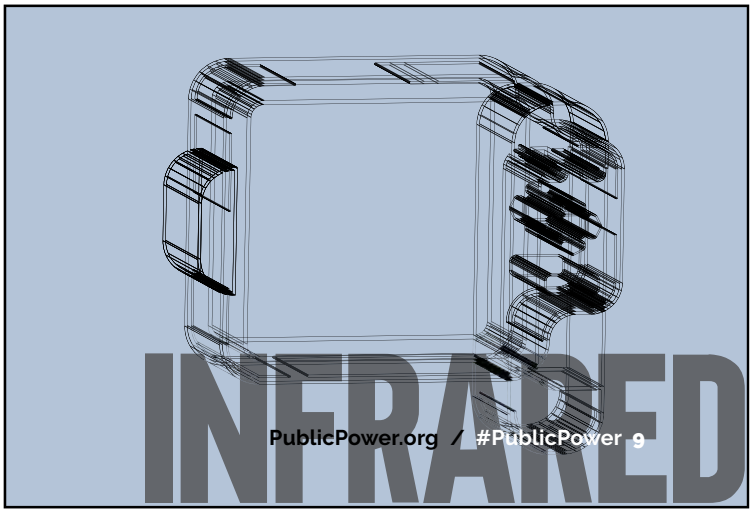
TABLETS



DRONES



CIRCUITS



INFRARED

**Hard hats and harnesses still have a place in keeping utility workers safe, but public power utilities are increasingly embracing new technologies to help provide safer working environments.**

**From deploying unmanned drones to inspect hydroelectric dams to using infrared cameras that can locate hot spots in substations and switching off breakers remotely, technology now stands alongside steel-toed boots as a cornerstone of some utility safety programs.**

## UP CLOSE FROM A DISTANCE

For the first time in Grant County Public Utility District's 81-year history, the utility has a drone pilot on staff. The drone operator's full-time job is security supervisor at the PUD, and he mostly uses the drone for aerial security surveillance around the PUD's dams, substations, and transmission assets, but he has also helped to give utility crews an eye in the sky during a variety of operations.

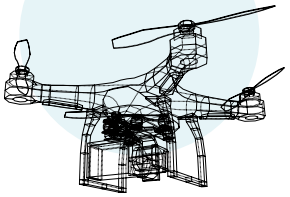
Grant PUD serves about 40,000 customers along the banks of the Columbia River in Washington state, and it started using drones about four years ago to inspect its Priest Rapids and Wanapum dams on the Columbia River and for security surveillance around its dams and substations.

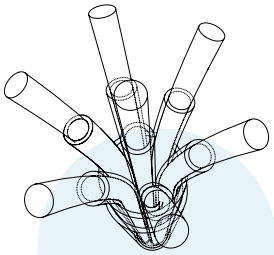
Before deploying drones, Grant PUD inspected its dams with a utility worker standing on the skids of a helicopter and peering through a pair of binoculars, while the pilot navigated unpredictable winds and dodged high-voltage transmission lines.

Now a drone armed with an infrared camera can hover several hundred feet over the Columbia River and within a foot of a structure and beam back high-definition photos to engineers and dam operators safely parked on the shore.

"Using the drone has been super handy," Brandon Little, an engineer with Grant PUD, said. "We get great looks at monolith or various other components in the spillway. The drone is much faster than scheduling a crane, crew and man basket, and it's much, much safer."

> **"The drone is much faster than scheduling a crane, crew and man basket, and it's much, much safer."**
>
> **BRANDON LITTLE,** ENGINEER, GRANT COUNTY PUBLIC UTILITY DISTRICT, WASHINGTON





> **"Any time you have a controlled outage, people are much safer. People aren't rushed, they aren't hurrying to try to get customers back into service, which just makes for a much safer environment."**
>
> **BRIAN GROTH,** DEPUTY DIRECTOR, NAPERVILLE ELECTRIC DEPARTMENT, ILLINOIS

Grant PUD also uses drones to get aerial photos of earth embankments around the dams that over time can show if there has been any movement, Little said.

Cameras also now assist employees during critical lifts with cranes. The camera allows confirmation of clearances without requiring an employee to enter the overhead safety zone. This keeps workers farther away from objects that could potentially fall during heavy lifts.

## GETTING AHEAD OF HAZARDS

The Naperville Electric Utility serves 60,312 customers in the city of Naperville, Illinois, and has been using a variety of technologies to help keep workers safe and give it longer lead times when doing preventive maintenance.

The public power utility, which this past June celebrated its 120th year in service, uses its Supervisory Control and Data Acquisition system to remotely control breakers at all 16 of its substations.

Closing breakers remotely keeps lineworkers away from faulty equipment while it is being deenergized.

"If a piece of equipment is failing or needs to be removed from service, no one will be in the vicinity of that device while it's being deenergized," said Brian Groth, deputy director at Naperville's Electric Department.

After a series of hot days, Naperville crews will inspect substations from a distance using infrared cameras that show the temperature of pieces of equipment. Those thermal photos are then logged and cross-checked each time the substation is inspected.

This allows crews to get ahead of any potential problems, while also keeping workers away from equipment that may be stressed.

"In a world of long lead times for parts, we can order things when they start to get a little warm, as opposed to having a burning pile of steel," Groth said.

He said that Naperville is focused on preventive maintenance, and the use of thermal photography helps the utility chart and plan for controlled outages.

"Any time you have a controlled outage, people are much safer," Groth said. "People aren't rushed, they aren't hurrying to try to get customers back into service, which just makes for a much safer environment."

## STAYING INFORMED

Snohomish County PUD, which serves 350,000 customers just north of Seattle, outfits all of its utility crews with iPads that can access a map of the PUD's entire network, as well as a variety of other maps and documents, and can be linked to the utility's control room during storm recovery operations.

The iPads, which were put into use about three years ago, may have already prevented serious injury.

Jake Larson, journeyman lineworker with Snohomish PUD, said a crew was out restoring power at night in late August this year when they came upon a private bridge in rural Monroe, Washington. The crew used the iPad to access the utility's database of private bridges to see if the wooden structure was certified to hold a 40,000-pound line truck. The bridge was not certified, so the crew parked the truck and walked their gear across the bridge.

In September, that same bridge collapsed under the weight of a truck carrying septic vaults. The driver of the truck wasn't seriously hurt in the accident, but the truck crashed through the bridge and ended up on its side in the creek below.

Jake Morgan, a fellow journeyman lineworker with Snohomish PUD, described the utility-issued iPads as a "game changer."

"It's the most valuable piece of equipment in the truck," Morgan said. "It not only gives us a map of our system, but it hyperlinks to photos and inspections reports. We can link a program to Google Maps, put the equipment number in, and drive right to a location."

If crews are restoring power during a storm, they'll get a switching order from the PUD's control center, pull up a map, "then we can double, or triple check, to see if every point on the line is properly open," Morgan said.

"We can make sure that every switch along the line is open, so there's no chance of the line being energized," he said.

## BOLSTERING SECURITY

In the picturesque Flathead Valley of Montana, technology is used not only for the physical safety of workers, but in the virtual world to keep the Flathead Valley Cooperative network from being breached.

Mike Parrish spent 20 years in Naval intelligence and is now director of information technology at the co-op. He leads a team of IT professionals in defending against potential cyberattacks.

"The biggest risk we protect against — and all small municipal governments and utilities worry about this — and that's getting hit with some kind of ransomware that shuts us down," Parrish said.

He said the utility uses a layered approach to security, with a variety of different systems to protect the co-op's network and consumer information. The utility also deploys a suite of cameras and surveillance technologies to keep its headquarters safe.

"Kalispell and the Flathead Valley is really a small and friendly place, so the last thing we wanted was to make this place look like Ft. Knox," Parrish said. "So, we tried to deploy technology in a common sense way, so that it didn't look like a fortification."

## IMPROVING TOOLS

The biggest development might be the widespread acceptance of lightweight, battery-operated, ergonomically designed tools that now fill utility trucks.

"I remember back nine years ago when we didn't have battery-powered tools," Larson, the journeyman from Snohomish PUD, said. "We now have impact guns, drills, saws — you name it — [which are] light and ergonomic. It means I can work for 40-plus years in the trades and be able to do what I want with my life, outside of work, and not have to go through multiple shoulder or back surgeries."

Craig Bressan, senior manager of safety and industrial training at Grant PUD, said the use of lighter battery-powered tools has cut way down on the number of repetitive motion and back injuries at the utility.

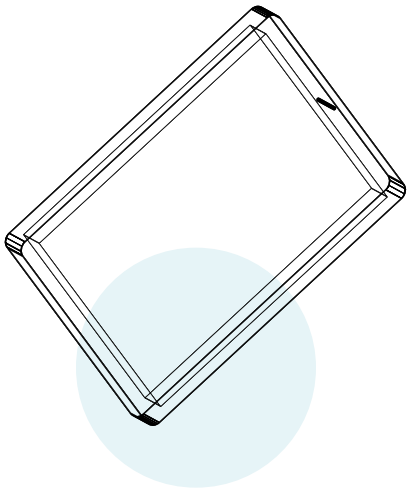
"It's all been redesigned to be lighter and ergonomic," he said. "Linemen are lifting much lighter weights now. It's been a huge game changer."

## NEW TOOLS, SAME MINDSET

Even with a wealth of information and technology at a lineworker's fingertips, safety still comes down to awareness and teamwork.

Lineworkers at Snohomish PUD might not have to run around in the dark wondering where to go, Morgan said, but the job still presents its dangers.

"The iPad doesn't make us any safer. Good work habits and training, and just looking out for each other, is what it comes down to," Morgan said. "The tools allow us to access information and that makes our jobs easier and more efficient, but



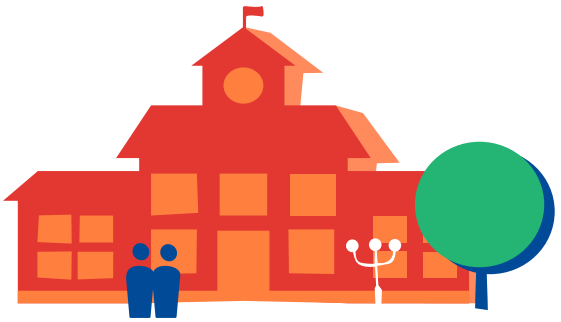
ultimately it's me looking out for Jake and him looking out for me."

"It's nice to have all these tools at our disposal, it makes it easier do what's best for that situation and helps us be more efficient, but safety really comes down to us," he said.

# Building safety literac

**BY SUSAN PARTAIN,** SENIOR EDITOR AND CONTENT STRATEGIST,
AMERICAN PUBLIC POWER ASSOCIATION

# sy



Everyone uses electricity, but learning how to use it safely is an ongoing process. As stewards for electric safety in the community, public power utilities play an important role in educating community members about how to stay safe when using electricity or around electrical equipment.

Building electrical safety literacy in a community means utilities must be able to engage community members of all ages, often starting with kids in schools.

## Creating safety champions

Edmond Electric in Oklahoma has been offering a safety presentation to fourth and fifth graders for the past 10 years. In educational videos, mascots "Neon Leon" and "Lightning Liz" tell kids how electricity flows and teach them how to stay safe around utility equipment out in the community. Lineworkers supplement the video demonstration with additional safety messages and scenarios, and they often deliver the one-hour presentation to an auditorium of fourth graders.

Jessica Lyle, community relations coordinator at Edmond Electric, said that the utility usually provides the presentations to an area elementary school two or three times a year, including sometimes as part of a summer program.

Lyle emphasized that the utility aims to give the presentation shortly after the students have learned about energy in the curriculum. That way, the presentation can reinforce what they learned and be a valuable chance for the kids to see electricity in action once they've learned about it.

In Ohio, Piqua Power System has been providing safety demonstrations to intermediate schools for at least 30 years, said the public power utility's assistant director, Bob Bowman. The demonstration includes a tabletop display that covers a variety of electrical hazards that kids might encounter at home or outside.

The National Energy Foundation, which has a mission to promote energy literacy, works with utilities to develop materials about a variety of energy topics. NEF developed a program called Energy Safe Kids, which includes an in-class presentation and a suite of materials that can be tailored to a utility's service territory.

Ian Wright, director of business development at NEF, shared that beyond the foundation's safety-specific suite of materials, safety has been a "major component" of all topics the foundation covers. Public power utilities, such as Austin Utilities in Minnesota, have worked with NEF to share energy efficiency messages with local schools.

"Students are an oftentimes underestimated resource to get a message out to the community," said Wright. "They really absorb the information and are excited about it … and they are able to reach family members and adults in a way that we or the utility can't. Adult programs are great, but students really have a drive, really have a fire, and adults are going to listen to those kids."

## Bringing the message home

For two weeks each October, Huntsville Utilities in Alabama hosts area fourth grade classes for an event called Education Days. The event brings classes from most of Huntsville's three school systems to the utility's Electric Operations Building for a daylong visit that covers everything from how electricity is generated to tips for conserving water. An important component of the day is sharing the electrical safety messages and scenarios, such as what to do if the kids see a downed power line or are in a car that strikes a utility pole, according to Todd Long, Huntsville's electronic content administrator.

**"Students are an oftentimes underestimated resource to get a message out to the community. They really absorb the information and are excited about it … and they are able to reach family members and adults in a way that we or the utility can't."**

**IAN WRIGHT,** DIRECTOR OF BUSINESS DEVELOPMENT
NATIONAL ENERGY FOUNDATION

The public power utility has a safety demonstration trailer, which for Education Days is located within Huntsville's lineworker training yard. The yard is set up with full-scale poles and exercises such as hurtman rescue. Gary Whitley, communications and public relations manager at Huntsville, noted that this helps the students more easily connect the scenarios seen within the trailer, which are at a mock scale, to real life.

The students also get to tour the dispatch center, where the utility shows students their school on the switch map and points out any outages.

"Having them in that space really brings it home," he said. Bringing the kids on-site also makes it easier for lineworkers and other crew members, who might share a personal story about the importance of electrical safety, to take part in the program.

> **"We actually know that it is a really valuable, important trip because they are retaining it many years later."**
>
> **GARY WHITLEY**
> COMMUNICATIONS AND PUBLIC RELATIONS MANAGER
> HUNTSVILLE UTILITIES, ALABAMA

"Whenever a person can give a real-life experience, people seem to be intrigued by that," echoed Piqua's Bowman. He mentioned that it is important utilities ensure that the employees giving the program are the ones who are interested in providing it. "Those who are interested tend to shine and put effort into it."

Bowman said that educating the community about safety reflects the utility's culture of safety. "You have to believe in safety to begin with. Not for just the employees, but for the public and your customers as well. If the director has that mindset, it becomes somewhat infectious, and they are happy to spread that to others."

NEF's Wright said that presentations are ideally given to about three classrooms (75–90 kids) at once, which allows for kids to get more hands-on with the presentation. NEF structures materials so that there is a "take home" element, which sparks kids to share safety messages with their parents or others at home. For example, as part of its Energy Safe Kids materials, students will get a "household safety challenge" form that has children check (with an adult) for common electrical hazards (such as frayed wires), and asks whether everyone in their household knows what to do in potentially unsafe situations (such as if they see a downed power line).

The students are often incentivized to complete the form by offering simple rewards such as backpack reflectors if they bring the completed form back, and NEF sometimes offers teachers a classroom safety mini-grant if enough students return the forms. The foundation also works with utilities to promote competitions, such as a poster or video contest, that encourage kids to engage with their communities on safety messaging.

NEF also offers a digital curriculum, which students can access to get further into the topics.

The programs show a clear lasting impact. Whitley said that older students who come to the utility for a summer work program, and even some employees, will tell the utility how they "remember that fourth grade field trip. So, we actually know that it is a really valuable, important trip because they are retaining it many years later."

Edmond's Lyle noted that it is important for the safety presentation to be on the kids' level and relate the messages to what they like to do. For example, the presenters will often ask the kids if they like to climb trees or fly kites before talking about safe practices around power lines.

Several utilities, including Huntsville and Piqua, noted that their demonstration involves showing how a hot dog reacts to coming into contact with electricity. Kids learn that the human body is composed of a similar amount of water as the hot dog and would be affected in much the same way. Although a simple message, it is definitely one that sticks.

Bowman noted that his daughter, who is now 29, has friends who still refer to him as "'Bob the hot dog guy' — and that was from a demo I gave when they were in junior high."

## The right time

While utilities acknowledged that safety messaging can be shared at all ages, many noted having the most success with fourth and fifth graders.

This is often when school curricula will begin to cover energy and electricity, noted Wright. NEF structures its suite of materials around national learning standards and in consultation with teachers and other educational professionals. "If our materials didn't align with the curriculum, they wouldn't be taught in the classroom," said Wright, adding that the specific focus on safety alone can be a big challenge because safety is often not an element of the curriculum in schools.

Focusing on slightly older kids also allows the messages to be more meaningful.

"While it is cool for first graders [to see the demo], they don't really get the message," said Lyle. She said the school outreach focuses on fourth and fifth graders "because they've gone through energy lessons and they understand more or less what electricity is and how it works."

Bowman also noted that teachers or the school districts will reach out to request the presentations based on when they have covered electricity in the curriculum. He said that the utility can modify the program based on teacher requests to emphasize certain areas that might align more with the curriculum, but that the presentation mostly stays consistent. Bowman has come to expect that schools will request to schedule the presentation before winter and spring breaks.

"Students are old enough that they can start to grasp more complex topics and getting to the point where they are really engaging with their family and friends," added Wright. "We have fun stuff for the younger kids, but the difference is the robustness of the curriculum."

## Connecting with schools

While knowing the curriculum is helpful to making an entry into the schools, Wright emphasized that utilities are a trusted resource in their communities and often seen as the experts on energy topics.

Whitley said that Huntsville has held its Education Days event for 18 years. The utility sends out invitations to the event at the beginning of the school year, and Whitley noted that area teachers have come to expect the program every year. Since the city has been growing, the event isn't able to reach all schools, but Whitley said they "try to bring in as many classrooms as we can." He expected that the event would reach about 1,800 students in 2019. Condensing the sessions into a 10-day period helps make the most of staff time and resources. Whitley said that about five people staff the trailer and that the event takes a lot of staff time to coordinate.

Outside of Education Days, Whitley said that the utility is sometimes invited to classrooms to provide shorter educational sessions.


## Safety education everywhere

"We try to incorporate safety messaging whenever and wherever we can," said Whitley. As an example, he mentioned that Huntsville incorporates safety messages into outage communications, emphasizing that the utility wants people "to know that our crews are working, but also that they have to work as safely as possible." Huntsville also brings its demo trailer to various community events to share the messages with community members of all ages.

In Oklahoma, Lyle said that Edmond Electric has hosted safety fairs at local hardware stores, where it has invited other community groups with a safety message — including police, fire, and a bicycle safety committee — to participate. At such events, the utility has set up a diorama with a power pole and electric lines to talk about what to do if there's a downed line. Lyle said the events mix in safety messages with fun activities, such as challenging kids to screw in a bolt while wearing insulated rubber gloves or using a hot stick to open and close a fuse.

Lyle noted that although these activities are focused on kids, the community events allow the utility to share messages with parents at the same time. As a bonus, Lyle said that parents often express kudos or thanks to the utility workers during these events for restoring power quickly or for other work, which helps to boost morale.

Bowman said that Piqua Power will bring the demo to "anyone who calls and asks." He said the utility has given safety demonstrations at a variety of community fairs and festivals, for Cub Scout groups, "anything to get the safety aspect out." He estimated that the utility participates in about four festivals a year.

"Whenever we set up a display … we always have people intrigued," said Bowman. He said that students who saw the presentation in school will often approach the display wanting to show their parents, grandparents, or friends.

"It is important to build a relationship, not only with the teachers and principals and schools, but the public in general," he said. Sharing safety messages doesn't just keep the community safe, it also helps build a rapport between the community and the people who help keep the power on.

# MAINTAINING A CULTURE OF SAFETY IN THE 21ST CENTURY

**BY JOHN EGAN,** CONTRIBUTING WRITER

A utility culture that values and embodies safety has long been a priority for public power utilities across the U.S. Even though the idea of having a culture of safety has been static for decades, the way this culture shines through has shifted as workforces change and new technologies emerge.

For public power, ensuring that workers value safety starts from day one and continues through training and regular safety messaging.

## HIRING FOR FIT

As older workers retire, utilities are filling those positions with workers who might bring a new set of expectations and skills.

"There's a shortage of qualified and experienced people, and we're all having to make a lot more effort to recruit new employees," said Kenny Roberts, senior safety and training specialist for ElectriCities of North Carolina.

Todd Prangley, manager of transmission and distribution line construction and maintenance at the Sacramento Municipal Utility District in California, said, As part of our on-boarding process, we set very high expectations for our apprentices. Hard work and a desire to succeed are only some of the ingredients. Our focus is on teaching our apprentices how to think on the job site so they can anticipate and avoid the next safety obstacle. In my experience — whether it is now, decades ago, or the years in between — most of these folks already know it's going to be hard training and hard work, regardless of generational differences that one might see in other types of workplaces."

It will be hard to keep the lights on without millennials, the largest generation in the U.S., numbering some 92 million, according to Goldman Sachs. Millennials comprise nearly 50% of the U.S. workforce and will jump to 75% of the workforce by 2025, according to Janet Kieffer, principal at Influence, a Dallas-area consultancy.

"Millennials tend to be more loyal to people than to companies, and they will stay in a job as long as they feel they are doing something meaningful," Kieffer said last June at the American Public Power Association's National Conference. "Getting, and keeping, millennials often turns on the onboarding process," including safety training, she said.

Chad Davis, operations manager at Rolla Municipal Utilities in Missouri, said that the utility focuses on an individual's personality, not a high-level generational profile, to ensure fit. After all, he said, you're trying to hire an individual, not an entire generation.

Davis recognizes the power of organizational culture. "We want people to go home after their shift in the same condition as they arrived for work."

## USING TECHNOLOGY

Utilities are taking advantage of technology, and workers' preferences to use it, to develop and underscore a culture of safety.

"Millennials are much more tech savvy than prior generations, and they're more receptive to safety training, providing they can access it online," said Roberts. "A lot of older workers learned most of what they know in a classroom and on the job, but younger workers want to see safety materials online, where they play [them] back several times if necessary."

Roberts recalled that when he began his career as a lineworker more than three decades ago, he was part of a group of 10 to 15 apprentices who alternated between classroom learning and on-the-job training. Though nothing beats field experience, Roberts said, "it has become pretty commonplace to deliver at least some safety training online."

"We began delivering content online in 2018 to better meet the needs of our member cities," he continued. He said that many of the training modules offered by ElectriCities can be accessed online.

This dual approach appeals to the variety of learning preferences of the crew members and provides logistical benefits. These days, ElectriCities is training about 330 lineworker

candidates from 73 member cities. "It would take quite a lot of staff to provide training in a traditional classroom setting," Roberts said.

Outside of training, an increased preference for using technology means that utilities can put additional tools focused on safety into crew members' hands. Davis said Rolla Municipal Utilities is planning on replacing its paper-based maps with a geographic information system, which should enhance safety as it provides an up-to-the-minute digital picture of the health of the electric system.

He said he was curious to see how the utility's field workers will adopt the new technology. "Some of our people with a lot of experience in the field may not be as quick to pick this up as the younger field workers. But it may be the other way around. We'll have to see."

## MEASURING AND REWARDING SAFETY

Unlike larger utilities, Rolla rarely has all-hands staff meetings, providing less opportunity to regularly discuss safety with all employees. Part of what helps promote safety as central to the utility's culture is an annual safety banquet held each fall. At the banquet, any employee who has worked without a safety incident for six months gets a $50 check. A full year without a safety incident doubles the payout to $100.

Beyond the financial incentives, Davis said the event is a one part of communicating a culture of safety to all attendees, whether they

> "A lot of older workers learned most of what they know in a classroom and on the job, but younger workers want to see safety materials online."
>
> **KENNY ROBERTS**
> SENIOR SAFETY
> AND TRAINING SPECIALIST
> ELECTRICITIES OF NORTH CAROLINA

# NEW SAFETY TRAINING VIDEOS

**BY PAUL CIAMPOLI,** NEWS DIRECTOR, AMERICAN PUBLIC POWER ASSOCIATION

The Minnesota Municipal Utilities Association, working with several other public power organizations, developed a series of instructional safety videos as a result of a $100,000 grant from the American Public Power Association's Demonstration of Energy and Efficiency Developments (DEED) program. Several videos are updates to videos produced in 2002 using a prior DEED grant.

The series of 22 videos were made for apprentice and journeyman line workers who work at public power utilities and cover a variety of safety situations. Several new topics have been introduced in the second edition of the videos, such as confined space rescue and self-rescue from a bucket truck. The content presented in the videos reinforces the Association's Safety Manual, National Electrical Safety Code, and appropriate Occupational Safety and Health standards.

Each video is one minute and 30 seconds to three minutes long (down from about 10 minutes each in the original series) – making them easy to view in the field on a smart phone or tablet. This means a line worker can watch a video on a smart phone right at the pole or the confined space or whatever situation they might be going into.

The series might be particularly beneficial to smaller utilities that may not have a full-time safety professional on staff.

Mike Willetts, director of training and safety at MMUA, was involved in the 2002 set of videos as well as the new set of safety videos. Willetts noted that Lee Hicks, who was the safety manager with Indiana-based public power utility Peru Utilities at the time, took the lead on the original set of videos. Peru Utilities sponsored the project, which was an eight-volume series of safety training videos.

MMUA worked with the Northwest Lineman College to produce the new set of videos. Willetts served as the subject expert on the safety material, while the college provided its expertise on video production.

Willetts said that the new safety videos have received positive reviews.

Along with the $100,000 grant from the DEED program, the project was funded by in-kind contributions from more than a dozen DEED member utilities.

The videos are available to DEED members at no cost and are embedded in the beta version of the Association's eSafety tracker. For non-DEED members, the videos are available for purchase on the Association's Product Store. **https://ebiz.publicpower.org/APPAEbiz/ProductCatalog/Product.aspx?ID=8976**

are employees, former employees, spouses, or invited guests. The Missouri utility has about 55 employees, and its 32nd Annual Safety Banquet, held in late October, drew about 100 attendees. He emphasized that the safety banquet "helps create a mindset and sets an expectation for all employees that safety is job one."

Something's clearly working at Rolla. In fiscal year 2019, the public power utility had a worker's compensation profile that was over 10 percentage points better than the average of 84 Missouri cities, utilities and governmental agencies. So far in fiscal year 2020, it has improved on that, with a profile that is about 25 percentage points better than average, the best among the group's 84 members.

For more than 15 years, Davis said, RMU has received a perfect score in the pool's annual loss-control program measurement. "There are multiple components to the review, from safety meetings to vehicle inspections to insurance requirements we place on contractors," he explained. "Receiving a perfect score for over 15 consecutive years is another good example of the success of our program."

In California, SMUD thoroughly investigates every near-miss incident to ensure it captures lessons that can be used to further improve its safety procedures. "Last year, those investigations resulted in considerable improvements in the safety tailboard requirements our forepersons use," Prangley commented.

Crew communications and tailboard meetings have played a significant role in reducing both near-miss events and serious injuries and fatality incidents, he continued.

SMUD takes a deep dive, called TapRoot, into accidents and near-misses to examine whether management built a robust enough

system to allow all employees to work safely and succeed. "If our investigation only concludes that an employee did something wrong, we are not improving our organization or our safety culture, so we strive to go much deeper than that," Prangley said.

Roberts mentioned how ElectriCities uses the Association's eSafety Tracker, which was developed to help utilities document and analyze safety-related events, with a particular emphasis on understanding the root causes of accidents, near-misses and injuries. Roberts said the utility is excited about how the eSafety Tracker can help him to develop and maintain safety training.

"You can't manage what you can't measure," said Roberts. "[The tracker] makes it so much easier to measure safety performance accurately and consistently. You can do a keyword search, pull up videos, track 'near misses' and review a safety message of the day."

> "If our investigation only concludes that an employee did something wrong, we are not improving our organization or our safety culture, so we strive to go much deeper than that."
>
> **TODD PRANGLEY**
> MANAGER OF TRANSMISSION AND DISTRIBUTION
> LINE CONSTRUCTION AND MAINTENANCE
> SACRAMENTO MUNICIPAL UTILITY DISTRICT

## A DAILY REMINDER

An organization's culture is an important aspect of how safety practices and expectations are reinforced. Those expectations and practices can be relayed in face-to-face meetings, over an app, or using other means. What's important is that they are conveyed clearly, consistently, and repeatedly. In this regard, workers' embrace of advanced technology is making work in the field safer.

One way that public power utilities are sharing regular safety messages is through a feature of the Association's eSafety Tracker, a service that launched in early 2019. The service offers a weekly safety message that can be shared with crews, and utilities can add more frequent and customized messages to the platform. Sample messages include:

- Fire extinguishers are our first line of defense in the event of fire, which should warrant a periodic and thorough inspection of them. Fire extinguishers must be kept clean to attract attention, they must be kept accessible to eliminate lost time when needed, and the rubber hose, horn or other dispensing component must be checked to guard against blockage.
- Falls from different elevations are usually more serious than falls on the same level. These can be caused by slipping and tripping but are also caused by many other factors, such as misjudging a step or a grab bar on a piece of heavy equipment, overreaching a ladder or scaffold, not tying a ladder off properly, faulty handrails on scaffolds, not using safety belts when we should, etc.
- If you are experiencing fatigue while driving, frequent rest stops should be made. Any activity that substitutes a different physical act for the monotony of driving helps to refresh the driver.
- The first requirement for safe backing is to have a spotter, someone to direct the driver. A spotter is necessary when the driver or operator does not have a full view of the backing path.

## MODELING SAFETY

SMUD's Prangley underscored the importance of mentoring as a way to set expectations: "Our management team mentors new linemen as they go through the apprenticeship process. We want to be sure they understand that sacrifice is part of being a lineworker. There are going to be times where they are away from their families. They might miss the soccer game or the birthday party. It's part of the duty involved when we commit to keeping the lights on."

"This is important at any utility, but more so when the utility is a community-owned electric company like SMUD," he continued. "Our customers own SMUD, and they expect reliable service — whether it's a rainy and windy storm day, or a beautiful sunny day when a car accident takes out a power pole or two."

Prangley noted that SMUD has increased its safety-field interactions. These are targeted visits of field crews by supervisors, all of whom have worked for years in the field. "Those visits certainly go a long way in promoting safety," he said.

# PUBLIC POWER MAKING STRIDES IN SETTING SAFETY STANDARDS, PRACTICES

**BY PAUL CIAMPOLI,** NEWS DIRECTOR, AMERICAN PUBLIC POWER ASSOCIATION

A Q&A with JON BEASLEY, vice president for safety and training at Electric Cities of Georgia, and MICHAEL WILLETTS, director of training and safety at the Minnesota Municipal Utilities Association.

Beasley has worked on the American Public Power Association's safety manual for more than 25 years and serves as vice chairman of the Association's Safety Manual Revision Task Force. Willetts has been involved with the Association's safety manual development process from 1996 to the present and has served as chairman of the task force since its inception.

**Can you discuss the progress that public power utilities have made in recent years when it comes to safety?**

**MICHAEL WILLETTS:** Public power is considered one of the leaders in the industry when it comes to safety, training, and employee development.

It is common for very small utilities and cities to take advantage of high-level training and development, which was not taking place 20 years ago. Not only has progress been made when it comes to safety within electric utilities, there has also been a huge increase and response within all city operations and related functions.

Users of [the safety manual] are able to not only find the most up to date [National Electric Safety Code] and Occupational Safety and Health Administration standards and regulations, they are also able to find best practices illustrating the best application of the standard. It's the only document that I know of that blends all the pieces that we need to work with as electric utilities.

**JON BEASLEY:** The public power community has made great strides when it comes to safety, with a big focus on the safety manual, which is the best I've ever seen or know of.

**How has your organization fostered a culture of safety, and what role do you play on a day-to-day basis to ensure that safety remains front of mind at your utility?**

**BEASLEY:** ECG holds safety meetings throughout each year. ECG deploys staff to various member cities to conduct safety and training meetings and utilize the safety manual, which is an integral part of those meetings.

It's common to find the safety manuals in any number of locations out in the field, whether it is on a truck dashboard or a vehicle seat. The safety manual is part of one of ECG's books in its apprenticeship program. Each ECG apprentice gets a copy of the safety manual.

Typically, whenever there is a safety manual update, we will try to buy enough for every one of our participants to give out to each person. Every lineman should have a safety manual in their hand.

**WILLETTS:** The safety manual is the backbone of the MMUA safety system within a long list of safety reference tools.

The MMUA safety team visits the membership and other related safety accounts monthly, focusing on safety, training and employee development, and helping them understand the rules and regulations, including the proper application of best practices, many of which are included in the Association's safety manual.

The MMUA safety team works diligently to ensure that work practices and safety rules match up in the field.

**Can you provide real-world examples of how the safety manual could be beneficial to public power utilities and their workers?**

**WILLETTS:** The one rule in the safety manual that stands out as being particularly effective is the "Use and Care of Rubber Gloves" (Cradle to Cradle and Lock to Lock rule). It's a best practice for a lot of utilities. It is the safest way.

When looking at incidents that can be classified as accidents over the past 20 years, most of them have to do with lack of or no personal protective equipment or rubber gloves or rubber sleeves.

In the development of the 15th edition of the safety manual, the task force added this new rule, which will help to avoid many contact mishaps today and into the future.

**BEASLEY:** A lot of utilities will conduct Monday morning safety meetings, and at these meetings, foremen will review a section of the safety manual. The following Monday they'll have their safety manual and they'll sit there and go through the next section, and that's where some of the questions come from in terms of interpreting something in the manual.

**Is there anything else you'd like to add in regards to the safety manual or how the task force makes sure it meets today's safety challenges in the power sector?**

**WILLETTS:** Mike Hyland [the Association's senior vice president, engineering services] takes ownership of everything he gets involved with. The safety manual task force wouldn't be as organized today without his leadership. Hyland brought the structure we needed to improve the revision process of updating the safety manual.

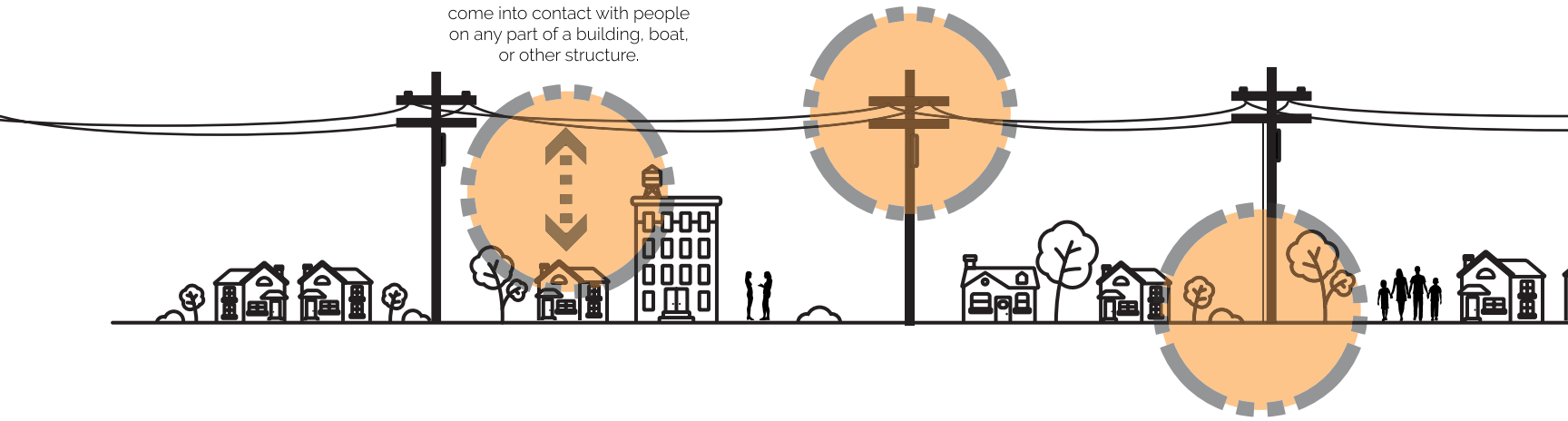
**BEASLEY:** I've never had to worry about his focus, his core, and I think you see that in a lot of the programs he's started up. He'll kick them off and get them going, and he'll put the right people in place and let it go, and that's where a good leader should be. I think he's been a tremendous safety leader for the linemen.

# DEFINING ELECTRICAL SAFETY

There are many areas to consider when it comes to staying safe around electricity. Codes, guidelines, and best practices define safety for areas including:

**STRENGTH AND LOADING**
Wires, poles, crossarms, and other structures must be strong enough to support equipment in a variety of conditions, including wind.

**CLEARANCES**
Equipment and line placement is codified to ensure that it can't come into contact with people on any part of a building, boat, or other structure.



**GROUNDING**
Equipment must be properly grounded to avoid conducting electricity beyond the equipment

## Creating a code

**Since it first published in 1914, the National Electrical Safety Code has been regularly**

**1938**
Operation of Electric Equipment and Lines released as part of NESC's 5th edition, which, among other guidelines, required marking lines and prohibiting use of metal or metal-reinforced tapes, hoses, or flashlights around energized parts

**1955**
American Public Power Association prints 1st edition of its Safety Manual

**1960**
NESC 6th edition published, the first done through a consensus process, and included voltage classifications and changed phase-to-ground voltage and ground clearances

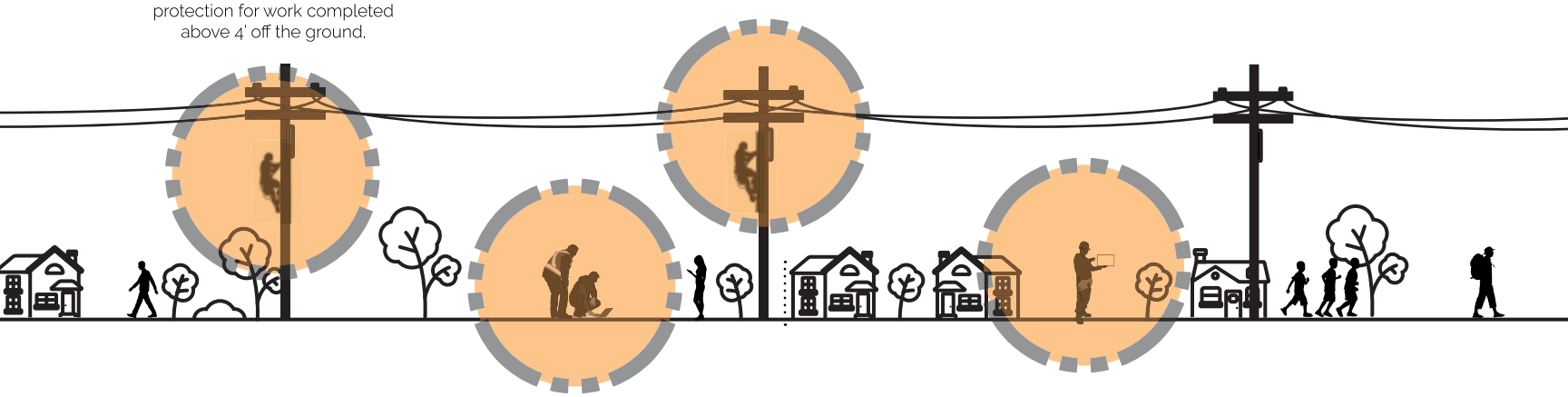
**1972**
IEEE takes over as Secretariat for NESC

**1977**
Overhead clearances of energized equipment expanded to at least 8.5'

**1984**
IEEE NESC Handbook first published as a companion to NESC

**AVOIDING HAZARDOUS CONTACT WITH EQUIPMENT**
Workers always wear insulated rubber gloves when working on energized equipment (known as the lock to lock and cradle to cradle rule).

**PREVENTING FALLS**
Workers must use fall arrest protection for work completed above 4' off the ground.



**MINIMIZING ARC FLASH INJURIES**
Workers are required to wear flame resistant clothing appropriate for the arc-flash potential where they are working.

**STAYING INFORMED**
As a best practice, crews regularly participate in safety briefings and identify hazards and personal protective equipment prior to the start of work

**updated to ensure that we can all live and work around electricity safely. Here are some key updates.**

**1993**
Employee training on suitable clothing combinations mandated in NESC update

**1997**
Significant revisions to strength requirements

**2002**
Minimum distance between hydrants and poles expanded from 3' to 4'

**2007**
Code specifies that structures, such as pools, cannot be placed above underground cables

The Association's Mike Hyland begins a decade of leadership as Chair of the NESC.

**2012**
Minimum approach tables simplified, requires assessing exposure for arc flash for lower voltages

**2017**
Requires fall protection equipment for work performed on poles or towers

The American Public Power Association releases 16th edition of Safety Manual.

# You probably aren't as safe as you think you are

**BY ALEX HOFMANN,** SENIOR DIRECTOR, ENERGY AND ENVIRONMENTAL SERVICES, AMERICAN PUBLIC POWER ASSOCIATION

Looking at the big picture of public power's safety track records, our utilities and employees appear to be relatively safe. Over the past few decades, we've seen the median incidence rate drop from nearly seven incidents (reported illnesses or injuries) per 100 workers to fewer than three incidents per 100.

Trying to benchmark public power utility safety data against the industry's incidence rate, which looks at the total number of reportable incidents by worker-hours in a year, does not really offer a utility meaningful data. A small utility might have an incident only once every 10 person years. In the year with an incident, the utility's incident rate would be really high, and it would have many zero years in between. This means that smaller utilities will more likely have skewed data, whereas larger utilities will show less variance in the incidence rate, even when they have an increase or decrease in incidents year over year. Long-term, the probability of an accident can be similar for utilities with wildly different annual incidence rates.

Measuring safety over the long term will allow us to see if we really are getting better, where our efforts are most effective and in which capacities. By comparing incident rates across equivalent worker-hours of exposure for numerous public power utilities, we started to see a clearer reference case of how frequently incidents occur. While not yet well-proven, we think this alternative way to benchmark public power's safety shows a lot of promise.

By including as many years of data as possible and making incidents proportional to exposure hours over time (e.g., halving the number of incidents a utility with 200 worker-hours has compared to a utility with 100 hours), better comparisons and benchmarking

becomes possible across a broader group. With longer historical data from more utilities, the ability to do these peer comparisons will expand, which will tease out patterns of unsafety, or at least allow a utility to find a more direct long-term safety performance comparison.

We tested this method of benchmarking for a medium-sized utility in the Pacific Northwest and found that the method showed significant promise in highlighting the utility's strengths and weaknesses compared to its peers.

The hope is that making these comparisons will show a more accurate probability of an incident over time, highlight differences between peers on a more level playing field, and allow utilities to see how they might adjust policies or practices accordingly to further reduce that probability.

To help utilities better benchmark and analyze their safety, we developed the eSafety Tracker, a service that utilities could begin to sign up for in early 2019. Utilities that have subscribed to the tracker are adding their safety data and benchmarking against other subscribers and historical data submitted to the Association's safety awards program over the years.

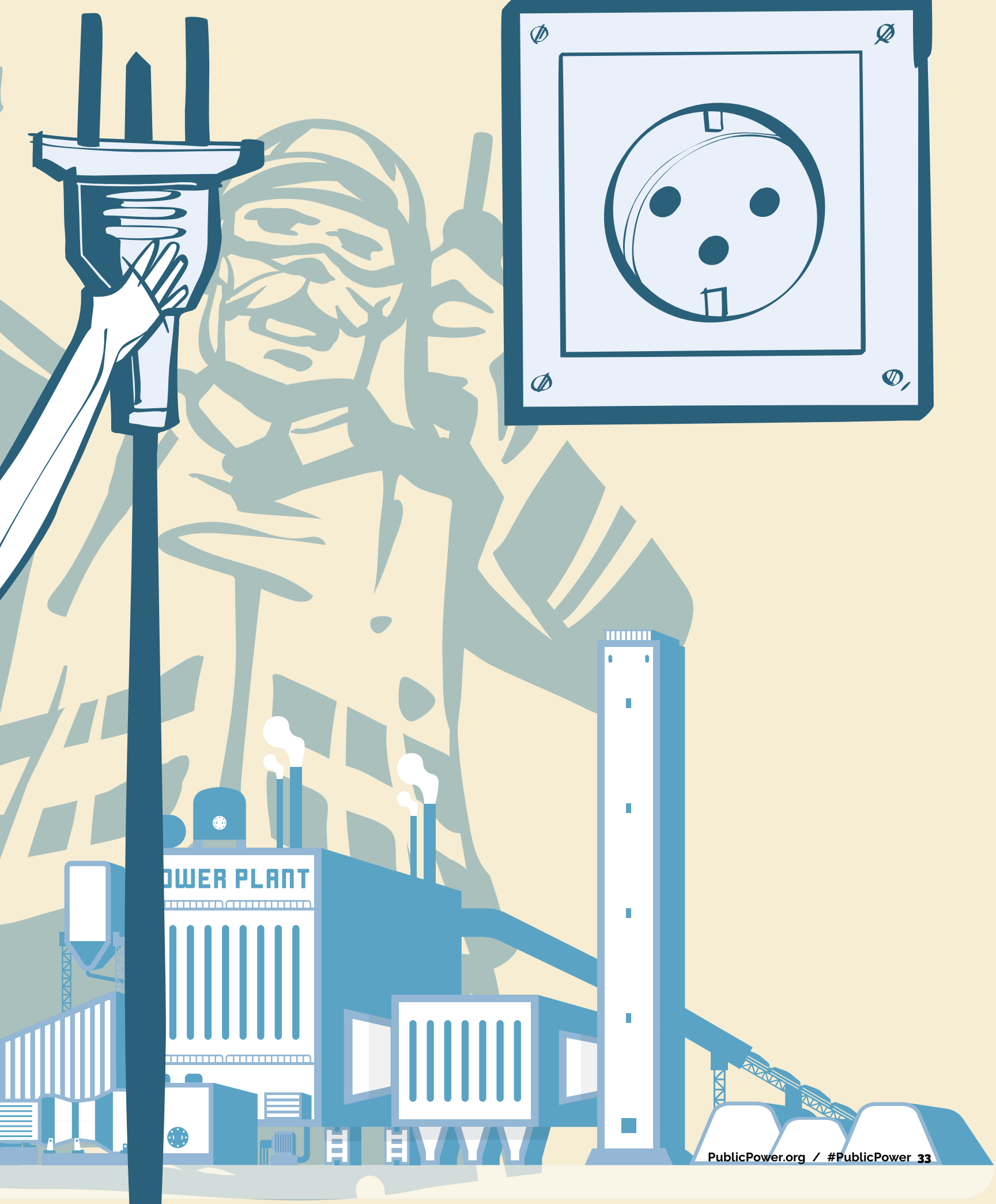
The picture we have from the available data to date can only take us so far. Looking ahead, utilities will need to see more granularity into how their workers are exposed, the causes and severity of incidents, and the types of trainings and briefings that are being undertaken to make better decisions and get ahead of potential issues. Our plan for the tracker is that it will help utilities to standardize and classify injuries and incidents, and eventually also capture near-misses in a more standard manner. If this is more standardized, then the data can also be analyzed across categories and severity levels, such as by putting all the cut rates or minor injury rates together. Even more exciting, the Association just received a patent for the tracker's planned predictive analytics feature, which will help public power utilities see the weak links in our processes and policies.

**Measuring safety over the long term will allow us to see if we really are getting better**

Better data leads to better decisions. When we can identify a trend, then we can learn from and address it. Because our goal is not to be "safe enough," but to make utilities a safer place to work and have everyone go home safely at the end of their shift.

# SAFETY IN GENERATION: PRIORITIZING PEOPLE OVER POWER

**BY JESSICA PORTER,** CONTRIBUTING WRITER


OWER PLANT

**Working with power-producing equipment — whether coal, natural gas, hydro, nuclear, wind, or solar — leaves no room for error, as even a small mistake can lead to injury or death.**

People who work at power generation facilities must be constantly mindful of their surroundings to avoid injury. According to the Occupational Safety and Health Administration, the most common hazards faced by electric industry workers include electrocution, falls, fires and explosions, environmental stress, confined spaces, sprains, strains, and fractures.

Safety has long been a top priority for public power utilities. While the American Public Power Association's Safety Manual is updated every five years, OSHA standards for work on electric power generation are not frequently updated. When OSHA instituted a new final rule in 2014 (29 CFR 1910.269 and 29 CFR Part 1926, Subpart V), including standards for electric power generation, that had been the first time in 40 years the agency issued rules for the field.

The final rule made safety for employees more consistent with standards in similar industries and included provisions for employees to share safety-related information, according to OSHA. It enhanced fall protection for employees working at heights and revised approach-distance requirements, so employees don't work too close to energized lines and equipment. It improved out-of-date safety requirements, ensuring that all equipment had methods to protect employees from electrocutions and providing guidance for the safe use and care of electrical protective equipment.

Many public power providers already had safety standards in place to address these issues. For those that didn't, OSHA set the tone for higher safety standards.

Here's how public power providers ensure employees go home safely at the end of the shift.

## INSTILLING SAFETY FROM DAY ONE

Operating safely isn't just about having the standards, but how leadership and employees alike apply and embody a culture of safety. Leadership at power generation facilities must make sure employees are properly trained for and comfortable with the necessary safety gear and strategies.

American Municipal Power Inc. — a joint action agency providing wholesale power and services for 135 utilities in Ohio, Pennsylvania, Michigan, Kentucky, Virginia, West Virginia, Indiana, Maryland, and Delaware — starts sending the safety message to all new hires from the first day.

***"IT MAKES MY JOB EASIER THAT OUR GENERATION OPERATIONS MANAGEMENT AND TEAM TAKE OWNERSHIP OF SAFETY AND QUICKLY ADDRESS ISSUES."***

**LEE DOYLE**
MANAGER OF CORPORATE HEALTH AND SAFETY
AMERICAN MUNICIPAL POWER

Employees typically spend their first day with human resources, getting the lay of the land and completing the necessary paperwork. For generation employees, the second and third days are spent with AMP's Manager of Corporate Health and Safety Lee Doyle, who leads new hires through a 10-hour OSHA class and talks about the importance of safety at all generation facilities.

The focus on safety doesn't stop with the onboarding process. Employees also participate in safety training throughout the year; some of the topics covered are required and others are suggested by team members.

Every Monday, leaders of all AMP generation facilities — including four hydroelectric plants and four gas turbine sites — as well as the corporate office participate in a call that begins and ends with a safety update. Doyle visits and communicates with each site regularly to ensure there are no unaddressed safety issues. "It makes my job easier that our generation operations management and team take ownership of safety and quickly address issues," he said.

AMP focuses so strongly on safety because the risks are all too real. Employees working at hydroelectric or gas turbine sites are regularly working from heights, in confined spaces, and on equipment that runs the risk of arc flashes — all top OSHA concerns. A hazard analysis is completed at each site to identify risks and determine ways to mitigate them.

"Hazard analyses help us determine how to protect employees in all situations with the right [personal protective equipment], arc flash protection, or even sometimes something as simple as hearing protection," Doyle said.

## PART OF EVERY CONVERSATION

The New York Power Authority takes a similar approach, instilling the importance of safety during orientation on the first day. Employees are encouraged to direct questions to their peers and leaders.

With 16 generating facilities, most of which are hydro, NYPA makes a significant effort to ensure that safety is always part of the conversation. If there's a meeting where three or more people are involved, safety is a talking point. Every meeting begins with a safety message. The effort began with the utility operations department and is spreading to other support departments across the organization.

"By making safety part of every conversation, it stays in your mind," said Kedaar Raman, manager of NYPA's Digital Utility Worker program. "As employees go through activities, they carry that message with them."

"Ultimately, the message we send is we expect to provide a safe work environment, and we expect them to carry a safety mindset all the time," Raman said. "We want them to be safe, no matter what — even when going home and weed-whacking."

***"WHEN WE'RE ABLE TO WORK SAFELY, IT AIDS PRODUCTIVITY AND EFFICIENCY — ALL FACTORS THAT ARE HALLMARKS OF WHAT PUBLIC POWER IS ABOUT."***

**JUSTIN ALBERTY**
VICE PRESIDENT OF CORPORATE COMMUNICATIONS
GRAND RIVER DAM AUTHORITY

Safety is also at the center of conversation at Grand River Dam Authority, which has a large portion of its 500 employees working in its Grand River Energy Center that includes a coal-burning unit and a combined cycle gas unit, as well as its three hydro facilities — two dams and a pumped storage facility — in Oklahoma.

No matter what type of generating facility it is, the message is the same. GRDA's safety team is embedded across all of its generation assets — ensuring the messaging is consistent in the organization as a whole, and not just at one site or another.

"We want our employees going home to their families safe and sound at the end of the shift," said GRDA's Safety Director Mike Vernnon. "Whether they are working at a hydro facility, maintaining a power line, or operating a thermal-generation plant, we emphasize the safety measures and the culture not only for that specific location, but for the broader GRDA mission."

Safety meetings are incorporated in all phases of the work schedule. Safety tailboard meetings occur at every location; toolbox safety talks happen at the beginning of every work week and often before each shift.

"Considering the equipment they are working on and the environment they are working in, we want employees always to be mindful of what they are doing and the safe way to do it; that's core to everything at GRDA" said Justin Alberty, vice president of corporate communications at GRDA. "When we're able to work safely, it aids productivity and efficiency — all factors that are hallmarks of what public power is about."

GRDA provides site-specific job and safety training in its generation facilities to help employees understand the potential risks and to develop work plans to mitigate those risks.

"Our team members understand the risks that are associated with installing high-voltage transmission lines and getting equipment energized," Vernnon said. "Our team is experienced and well-trained and, because of the exposure to these areas of electric generation and transmission, they maintain careful practices and procedures."

## LEARNING FROM EXPERIENCES

A culture of safety is not possible without a full commitment by leadership. "It starts at the top with the board of trustees and executive management team buying in, as well as the leadership at each generation site," said AMP's Doyle. "Safety is who we are and what we do; it's not something we just talk about."

AMP's efforts have paid off. The organization has had no recordables or injuries since its generation facilities have become operational.

The American Public Power Association's Safety Award of Excellence recognizes utilities with low recordable injury and illness incidence rates for all staff on a yearly basis. AMP has been recognized with the award four times in the last five years. When it earns the recognition, AMP's safety team makes a home-cooked breakfast for all employees to thank them for working safely throughout the year.

At NYPA, leadership feels a sense of personal responsibility for ensuring the safety of employees and makes an effort to always model safety. For example, if a supervisor is speaking with employees about the importance of safety gear, he or she is dressed in the appropriate personal protective equipment.

NYPA also holds regular safety tailgates. If a worker is about to work on a lift, management holds a tailgate about the importance of employees being aware of their surroundings. Management makes sure all employees are comfortable completing the task and are current with training.

Employees are also encouraged to share safety experiences. If an incident occurs, NYPA wants people to describe exactly what happened so they can understand the situation, learn from it, put measures in place to ensure it doesn't happen again, and move forward.

In addition, NYPA holds safety barbecues, which often include guest speakers to share stories about safety, at all generation facilities.

"Speakers may have been hurt on the job and help spread the message of safety," Raman said. "For example, there was a man who came from an industrial plant in the Midwest who had done something unsafe and got hurt. When you see him deliver that message, it stays with you."

NYPA's commitment to safety is just one reason it was the first electric utility in North America to achieve International Organization for Standardization 55001: 2014, a certification awarded for meeting rigorous asset management standards. ISO 55001: 2014 recognizes organizations with top asset management techniques that allow them to achieve operational and financial goals, including reducing the cost of capital and operations in addition to improving

risk management and environmental compliance. That includes maintaining good housekeeping in the shop and working areas and keeping equipment in top shape — all efforts to maintain a safe work environment.

"The main theme is continual improvement," Raman said. "We look at what we have and determine what we can do better."

The leadership team at GRDA made focusing on safety a priority. Leaders hold safety talks, training and meetings with employees to drive home the importance of working safely.

"Keeping safety at the forefront of every daily task is the priority," said Alberty. "GRDA is making the investment in our workforce to make sure employees have not only the resources, but also the training they need to get the job done. That positively impacts the organization in a number of ways."

## USING TECHNOLOGY

NYPA also is determining how technology can aid in increasing safety. It recently held its first virtual reality training for aerial lifts. Virtual reality allows NYPA to conduct safety training for all models of aerial lift equipment by simply typing in the model number, allowing employees to practice using the equipment in a virtual environment before operating it in the field.

"Virtual reality is very effective and a safety advantage for us," Raman said. "Employees can be on the ground but experience the task at height; it's a huge bonus to be able to tap into."

NYPA is also working on improving connectivity at its facilities. It recently began a project to ensure access to Wi-Fi and cell service at key locations. If there's ever a safety issue, employees will be able to report it and ask for help immediately.

With a combination of technology, leadership support, and a strong culture of safety, these utilities — and many more like them — show a commitment to their employees and to delivering power to their customers safely and efficiently.

# Eliminate safety gray areas around 5G pole attachments

**BY BRENT MCKINNEY,** CITY UTILITIES OF SPRINGFIELD AND PUBLIC POWER REPRESENTATIVE ON IEEE STANDARDS WORKING GROUP ON JOINT USE FACILITIES

For telecommunications companies, small cell or fifth generation (5G) wireless is the next evolution in their business. Deployment is going to happen, and it is coming fast. The upgrade will ultimately be good for society, but it means that we as utilities need to be interacting with telecommunications companies to make sure deployments don't have any unintended negative impacts.

Most critically, we want to be sure that both utility and telecom workers alike can work safely with any new infrastructure.

What's different about the 5G small cell attachments, compared to other types of pole attachments, is where they are placed. Companies often hope to install small cell antennas on the top of poles, where they tend to be more line-of-sight, within a relatively small area. That means utilities are getting more pressure to put antennas on distribution poles that already have power on them.

The Federal Communications Commission order issued in September 2018 gave telecom companies a lot of tools to be able to install these items, but the rule was issued without consulting with the Occupational Safety and Health Administration about how

installations could impact worker safety. That means we have a rule that allows for these installations, but not a method for making sure the installations are done safely.

Communication and electric lineworkers both will be affected. Communication workers are not trained to work in the power area, and power lineworkers might now have to work around a foreign device that's tied to other equipment down the pole. This sets up an unknown in a high-voltage workspace where workers really need to know everything that's going on, what's expected, and what the codes are to stay safe.

The National Electrical Safety Code does not specifically address attachments in the power zone or above power lines. Instead, there are many interpretations of what the code clearance should be. And when you start to have gray areas, there are always safety concerns.

In an effort to address these gray areas and get some clarity, the Institute of Electrical and Electronics Engineers formed joint use working groups to discuss the impact to the NESC. These groups, which include representatives from the power and telecom industries, in addition to OSHA, convened in October 2019 in Kansas City, Missouri. The meeting was a culmination of discussions that have been happening for the past year about joint use issues, with a primary focus on the application, installation and operation of small cell attachments.

**If we can assist telecom providers and offer a safe way for them to put the antennas in, then most companies will follow our lead.**

At the meeting, we presented a white paper, Establishing Consistency in Joint Use Applications with 5G Wireless Facilities. Utilities are invited to submit comments on the paper. The hope is to get as many comments as possible on the issues laid out from a variety of perspectives, so that we can develop common practices and standards through IEEE. Additionally, OSHA is looking toward having such an IEEE guide to help with its rulemaking on the issue.

More immediately, utilities should be making an effort to work with telecom companies at the local level. Utilities are going to have to determine a policy and a plan for how these items can be implemented in their communities and should do what they can to assist telecom providers. It is when a utility resists or doesn't offer any help that telecom companies will do whatever they can, which can lead to instances that might not be safe for the workers.

At City Utilities of Springfield, Missouri, we've found that if we can assist telecom providers and offer a safe way for them to put the antennas in, then most companies will follow our lead. For example, we offered to set poles — separate from the distribution system — for one large telecom company to do a big build-out in our town. This was a win-win, as having separate poles made it much easier for the telecom company to build and kept high-voltage and telecom facilities from being in the same area, and they paid us to do it.

This separation might not always be possible. With another company, we made an agreement that it could install antennas on our streetlights if it paid to retrofit the poles to be structurally sound enough.

The important takeaway is that we could offer a path for the providers to take. If utilities can give providers a path, they will generally take that path, which will avoid creating potentially dangerous situations.

# WHAT KEEPS ELECTRICAL WORKERS SAFE?

An array of special gear and equipment keeps crew members safe while working on electrical equipment and lines.

**HARD HAT:** insulated and rigid to protect workers from contact with electrical hazards or falling objects. Includes slots for adding in ear protection or face shields, when necessary.

**GLASSES:** Keep glare and objects/small debris from workers' eyes.

**GLOVES:** Workers wear two layers of gloves. Insulated rubber gloves protect from electric shocks and burns, and an outer pair of leather gloves help keep the rubber gloves from getting punctured or torn.

**HOT STICK:** Insulated fiberglass tool used when working with live lines and equipment.

**RUBBER SLEEVES:** Worn over clothes to protect workers from accidental contact with live lines or other equipment.

**CLOTHING:** Arc rated clothing such as jeans and shirts are made from flame resistant materials and avoid using metal components (buttons, zippers).

**SAFETY STRAP/ HARNESS:** Either connected to the inside of a bucket truck or attached around the pole to prevent falls.

**ROPE/HANDLINE:** Includes a pulley and steel clips to assist with lifting and lowering materials and acts as a lifeline in the event of an emergency.

**BOOTS:** Reinforced steel or ceramic toe, with serrated heels and reinforced sole for support in climbing and working on poles.

#PublicPower

# SPOTLIGHT ON SAFETY AT TWO BACK-TO-BACK PREMIER NATIONAL EVENTS

## PUBLIC POWER LINEWORKERS RODEO

April 17 – 18, 2020

- Attend safety training and the awards banquet in downtown Kansas City, Missouri.
- Show off your skills (or cheer on your utility's team) through Journeyman and Apprentice Team Competitions in Bonner Springs, Kansas at the International Lineman's Rodeo grounds.

Learn more, register, and book your hotel at **www.PublicPower.org/Rodeo**

SHOWDOWN IN THE SUNFLOWER STATE

## ENGINEERING & OPERATIONS CONFERENCE

April 19 – 22, 2020
Kansas City Convention Center, Kansas City, MO

- Refresh your skills at 35+ sessions on safety, transmission and distribution, utility operations, emergency management, and security.
- Network with 450+ engineering and operations professionals.
- Meet leading vendors at the premier expo

Learn more, register, and book your hotel at **www.PublicPower.org/EandO**

AMERICAN PUBLIC POWER ASSOCIATION
Powering Strong Communities


**Stay connected and in communication during a public safety response.** FirstNet gives energy, utilities and infrastructure personnel the confidence to stay connected during a public safety response with fast, secure, always-on communication. From the ability to coordinate with first responders to the ability to securely connect to key infrastructure and utilities personnel. Trusted by first responders across the country for all the reasons you should trust it, too. **Get the facts at firstnet.com.**

FIRSTNET®
Built with AT&T



Join our community