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RELAY

FLORIDA'S ENERGY & ELECTRIC UTILITY MAGAZINE
Volume 54 • Issue 3 • Winter 2022

Feature

MONEY WELL-SPENT: HOW INVESTMENTS IN ELECTRIC INFRASTRUCTURE BOOST RELIABILITY, RESILIENCY AND CUSTOMER SATISFACTION

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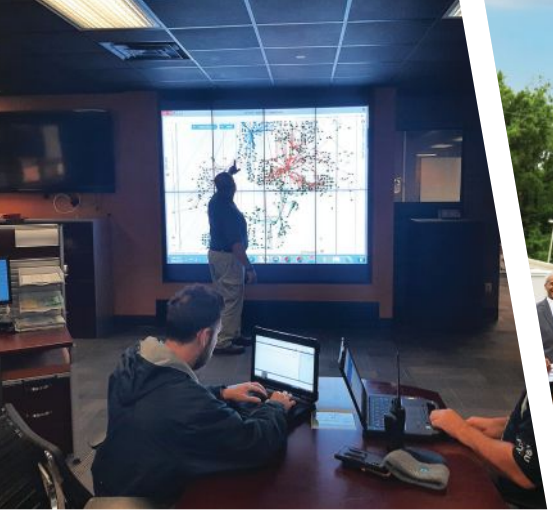

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Cover Photo: Timmy Wills, OUC line technician, works on FLISR installation in Orlando's Rosemont area. OUC plans to test the system throughout the summer storm season with the hopes that it improves service reliability to the neighborhood.

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Where in the world is *RELAY?*

Nicole Albers, FMEA director of public affairs and strategic communications, remembered to pack a copy of *RELAY* magazine on a recent trip to Arizona. Don't forget a copy on your next trip!
Send pictures to relay@flpublicpower.com.

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RELAY magazine Volume 54, Issue 3

by Amy Zubaly, FMEA Executive Director

Florida Public Power: Building a More Reliable, Resilient Grid

Reliability and resiliency are two buzzwords in the electric utility industry. Reliability is defined as the quality of being trustworthy or performing consistently well. Resiliency is defined as the capacity to recover quickly from difficulties. Translate that to the electric utility industry and reliability is a utility's ability to avoid outages, and resiliency is the ability of the electric system to withstand storms and bring power back after a major outage.

Florida public power utilities are making crucial reliability and resiliency investments in their systems to keep the power flowing. They are taking proactive steps and investing millions every year to bolster reliability, boost resiliency and build a next-generation smart grid.

For instance, many Florida public power utilities have installed smart devices on power lines to detect temporary faults that can result in long outages. These smart grid devices, called TripSavers, are a type of self-healing technology because they're designed to automatically clear or isolate a problem to maintain power or reduce the number of customers impacted by an outage. This smart grid technology can quickly resolve many common faults caused by animals, lightning and vegetation without sending lineworkers to the scene.

Some communities are using unmanned aircraft systems — or drone technology — to inspect power lines and other critical infrastructure. Drones can provide high-resolution photos, videos, thermal images and even 3D models of hard-to-reach and hazardous areas. This option helps keep lineworkers out of dangerous situations and saves the utility time and money.

Florida's public power utilities are also making significant investments in infrastructure projects, such as undergrounding power lines, installing new substations and circuits, and replacing and upgrading utility poles, transformers and breakers. These improvements help strengthen electric systems and provide greater reliability for their customers.

Here in Florida, we know all too well that hurricanes and severe weather pose a risk for widespread power outages. That's why many Florida public power utilities are upgrading their infrastructure, including poles and substations, to ensure they can withstand the strongest hurricanes. They are finding faster ways to get power restored by assessing storm damage more quickly with drones and other state-of-the-art applications.

Resiliency doesn't just refer to fewer impacts and quicker restoration from hurricanes. Additional investments in technology and training are bolstering Florida public power utilities' cyber and physical security protections in an age when critical infrastructure nationwide faces threats from across the globe.

Florida public power utilities are investing in grid-modernization technologies to keep up with customers' ever-changing and growing energy needs. They are deploying Advanced Metering Infrastructure (AMI) to collect more data to improve operations, enhance efficiency and boost communication with customers about energy consumption.

These are a few investments Florida's public power utilities are making to ensure a reliable, resilient, safe and secure system to power life now and for the future. ■

Odds and Ends
from Across the State

FMEA Members Honored with Restoring Communities Awards

FMEA in February honored 10 Florida public power utilities with Restoring Communities Awards for either providing or receiving mutual aid following significant weather events or emergencies, or providing exemplary service to their community following emergency situations.

In 2021, the utilities helped restore power quickly and safely in Louisiana and Florida following severe weather or other events, including Winter Storm Uri and Hurricane Ida, and following other severe weather. Receiving awards were:

- City of Bartow
- City of Fort Meade
- City of Tallahassee
- Fort Pierce Utilities Authority
- JEA
- Keys Energy Services
- Kissimmee Utility Authority
- Lakeland Electric
- OUC (Orlando Utilities Commission)
- Utilities Commission, City of New Smyrna Beach

Thanks to these utilities for answering the call to get power restored to communities in need!

OUC and City of Orlando Announce 2030 Solar Pledge

OUC – The *Reliable* One and the City of Orlando announced the 2030 Solar Pledge. Participating commercial customers, including the City of St. Cloud, Correct Craft, Orange County Government, Orlando City Soccer Club, Orlando Pride and UCF Downtown, are pledging to power their facilities with 100 percent solar energy by 2030.

The pledge also requires businesses to use at least 10 percent of solar energy upon signing, with the ability to increase their renewable energy commitment incrementally until 2030. The initial solar investment is provided through OUCommunity Solar, which gives both OUC's commercial and residential customers access to sustainable, maintenance-free solar without the upfront costs of adding panels on their businesses or homes.

It's an investment OUC began with the development of one of the first community solar farms in the country in 2013. Today, the utility is poised to offer 272 megawatts of solar energy, enough to power 50,000 homes by 2023.

As the first OUCommunity Solar business subscriber in 2018, the City of Orlando is increasing its solar energy use as part of its commitment to sustainability and renewable energies.

Florida Utilities Earn Public Power Communications Awards

Five Florida public power electric utilities earned Excellence in Public Power Communications Awards from the American Public Power Association, presented in November at the association's Customer Connections Conference in Arizona. The annual awards recognize excellence in communications. The entries are judged in three categories: print/digital, web/social media and video. Awards were given to those that showed ingenuity and creativity in telling their stories through outstanding copy, design, financial data presentation, graphics, social media engagement, video editing, and web layout and interactivity.

In the video category, the Utilities Commission, City of New Smyrna Beach

received the highest honors for its honeybees video, and JEA won for its "JEA Underground Linemen: What Do They Do?" video. Congratulations to Orlando Utilities Commission, Kissimmee Utility Authority and Beaches Energy Services for their awards in the print/digital category! Finally, the Orlando Utilities Commission won in the web/social media category.

Tallahassee, KUA Receive Smart Energy Provider Designation

Congratulations to the City of Tallahassee and Kissimmee Utility Authority on their designation as a Smart Energy Provider from the American Public Power Association. The Florida public power utilities are two of 70 public power utilities nationwide that earned the Smart Energy Provider designation this year. The American Public Power Association's Smart Energy Provider (SEP) program recognizes utilities for demonstrating commitment to and accomplishment in smart energy program planning, energy efficiency and distributed energy resources, environmental and sustainability programs, and communication and customer experience. Utilities keep the SEP designation for two years.

JEA Reducing Carbon Emissions with Closure of Plant Scherer Coal-Fired Unit

JEA is reducing its emissions footprint with the closure of Plant Scherer's Unit 4 in Juliette, Georgia. JEA has replaced coal-fired electric power from Plant Scherer with natural gas through a power purchase agreement with Florida Power & Light (FPL). JEA and FPL have jointly owned Plant Scherer, Unit 4, since 1991. Unit 4, operated by Georgia Power, ceased operations on December 31, 2021.

This decision by JEA and FPL benefits the utilities' customers and all of us with the transition to a cleaner power source. By replacing power from Plant Scherer with natural gas, JEA has lowered operating costs, reduced operating risks and reduced CO_2 emissions by approximately 1.3 million tons per year. JEA has reduced its carbon emissions by 53 percent since 2007 with the closing of St. Johns River Power Park coal-fired plant and the decommissioning of Plant Scherer.

Florida Utilities Send Mutual Aid Crews Following Winter Storms

FMEA assembled public power crews to aid with power restoration efforts for two back-to-back winter storms in January. More than 50 public power personnel from three Florida utilities deployed to pre-stage in Virginia and North Carolina in advance of severe weather from Winter Storm Izzy. JEA sent four crews and equipment to Danville, Virginia, to assist fellow public power utility Danville Utilities. The City of Tallahassee deployed two public power crews and equipment to Dobson, North Carolina, to provide aid to Surry-Yadkin Electric Membership Cooperative. Orlando Utilities Commission deployed two crews and equipment to assist the City of High Point Electric Utilities Department in North Carolina.

In addition, 75 personnel from five Florida Public Power utilities deployed to South Carolina in advance of Winter Storm Jasper to assist public power utility Santee Cooper, South Carolina's largest power provider and the source of electricity for 2 million people across the state.

JEA in Jacksonville sent four line crews and equipment, while Gainesville Regional Utilities (GRU) sent four crews, including two lineworker crews and two tree crews. Both Orlando Utilities Commission and Kissimmee Utility Authority deployed two crews from their respective utilities. Beaches Energy Services sent one crew from its team.

Florida Public Power Utilities Earn Strong Residential Customer Satisfaction Marks

Florida public power utilities earned top rankings in J.D. Power's latest Electric Utility Residential Customer Satisfaction Study. The 2021 Electric Utility Residential Customer Satisfaction Study was based on responses from 100,999 online interviews conducted from January 2021 through November 2021 among residential customers of the 145 largest electric utility brands across the United States, which represent more than 101 million households.

In the South region, the Orlando Utilities Commission (OUC), JEA and the City of Tallahassee were represented in the J.D. Power rankings. Along with public power utilities, the study also covered investor-owned utilities and cooperatives.

J.D. Power said overall electric utility residential customer satisfaction was 748 (on a 1,000-point scale) in 2021, a decrease from a record high 751 in 2020. ■

Who's Who *in the Florida Public Power Community*

FMEA Past President, Lakeland's Ivy Receives Prestigious FMEA Honors

The Florida Municipal Electric Association's Board of Directors in February presented the E.C. Shreve Jr. Lifetime Achievement Award to

Joel Ivy, FMEA past president and general manager of Lakeland Electric since 2012. Ivy has been an active member of FMEA's Board of Directors, serving as its president in 2018-2019 and on its Executive Committee for several years. In addition, Ivy received the American Public Power Association 2019 James D. Donovan Individual Achievement Award for his significant contributions to the electric utility industry and public power utilities.

FMEA's prestigious Lifetime Achievement Award is a high honor awarded to an individual who has devoted a significant part of their career to the advancement of public power in Florida. Prior to Ivy, FMEA had presented the award to only seven members since 2001. In addition, Ivy was designated by the FMEA Board of Directors as an Honorary Member.

Ivy will take over as Lubbock Power & Light's director of electric utilities later this year.

Tallahassee's Faris, Winter Park's Silva Win Top FCMA Communicators Awards

The Florida Municipal Communicators Association (FMCA) recently announced winners of its 2021 Outstanding Awards during a luncheon at its annual conference. Tallahassee Communications

Director **Alison Faris** was named Communicator of the Year, and Winter Park Events and Marketing Coordinator **Stephanie Silva** was named FMCA's 2021 Rising Star. The Communicator of the Year Award recognizes a standout government communications professional who has more than five years of experience. Faris was nominated for the award by her peers. The Rising Star Award recognizes a communications professional with less than five years in the government communications field who demonstrates achievement, excellence and innovation, possesses strong leadership potential and shows that they are a future industry leader. Both Faris and Silva are communications professionals for Florida public power communities.

JEA Names Its First Director of Diversity, Equity and Inclusion

JEA hired its first director of diversity, equity and inclusion, **Paul McFadden**. JEA says this role is part of an ongoing effort to promote a diverse culture. McFadden will provide strategic direction in executing JEA's vision of sustaining an inclusive, respectful and diverse culture. McFadden has a breadth of experience at JEA in human resources, and most recently, he served as a human resources business partner for the utility. In that role, he served as a consultant to management on human resources-related issues and worked with JEA's human resources department to find workable solutions.

JEA Names Economic Development, Strategic Direction VPs

JEA announced a new addition to its extended leadership team with the appointment of **Paul Mitchell** as the utility's new vice president of economic development.

Mitchell will provide strategic direction in executing JEA's economic development efforts, using his more than 15 years of industry expertise to attract, expand and retain jobs and capital investment for northeast Florida. Mitchell also will lead the utility's real estate team.

Prior to joining JEA, Mitchell was vice president of business development at Enterprise Florida Inc., where he helped create more than 30,000 jobs and $6.8 billion in capital investment since 2018. Before his tenure at Enterprise Florida Inc., Mitchell worked on business retention and expansion for Volusia County economic development.

In addition, JEA announced the appointment of **Jordan Pope** as vice president of corporate strategy. Pope has a breadth of experience at JEA, since 2006, in capital budgeting, government relations and economic development. Most recently, he led JEA's Real Estate team. In his corporate strategy role, Jordan will lead JEA's strategic direction, bringing together long-term plans to translate strategic focus areas into implementation. He will lead the Board Services, New Business, and Customer Solutions and Market Development teams.

Doug Peebles Named Ocala Electric Director

The City of Ocala promoted **Doug Peebles** to serve as director of Ocala Electric Utility starting in January 2022. Peebles most recently served as Ocala Electric Utility's deputy director. His service to the Ocala community spans more than two decades, with a career that began at Ocala Electric Utility as a line crew groundman in July 2000. Congrats to Doug on his new role!

Farewell and Happy Retirement to FMPA's McCain

After more than 35 years serving the Florida public power community, **Mark McCain** retired from the Florida Municipal Power Agency in February. McCain started with FMPA as a communications specialist in October 1986 and worked his way up the organization through various roles in public relations, public affairs, member services and human resources, culminating in his role at retirement as vice president of member services and public relations. Thanks to Mark for his steadfast loyalty to public power and significant contributions to the Florida public power community.

Tompeck Retires, Fort Pierce Utilities Authority Board Names New Director

After more than two decades of service to the Fort Pierce Utilities Authority (FPUA), Director of Utilities **John Tompeck** announced his retirement in early 2022. Tompeck was appointed director of utilities in 2017 and retired after more than 40 years in the electric utility industry. Tompeck served on the Board of the Florida Municipal Power Agency and was active in the Florida public power community.

Following his retirement, the FPUA Board of Directors named **Javier Cisneros** director of utilities. Cisneros is a lifelong resident of the Treasure Coast. He graduated from Okeechobee High School and attended Indian River Community College (now State College) and continued to the University of Central Florida where he earned a Bachelor of Science in civil engineering and a Master of Science in industrial engineering. Cisneros is a licensed professional engineer in the state of Florida and has served FPUA since 2000, most recently as director of utility support services for the past four years. As director of utilities, Cisneros is responsible for administering all operations, including electric, water, wastewater, natural gas and communication systems and will report directly to the FPUA Board.

OUC's Bullock Named to OBJ's CEOs of the Year

The *Orlando Business Journal (OBJ)* named OUC's General Manager and CEO **Clint Bullock** to its 2021 CEOs of the Year listing. According to *OBJ*, Bullock's top three accomplishments in the past year were OUC's $12.1 million COVID-19 Relief Package, OUC's 30-Year Energy Roadmap, or Electric Integrated Resource Plan (EIRP), and their Connected 2025 Strategic Plan. For his accomplishments, Bullock was chosen as one of the *OBJ*'s 2021 CEOs of the Year. Honorees were recognized at an October 14 awards celebration.

KEYS Announces Retirements, Promotions

Keys Energy Services recently shared several personnel announcements. Congratulations to **Jack Wetzler**, assistant general manager and chief financial officer, who retired on December 31, 2021, with 30 years of service. **Martha Ramas**, customer services leader, also retired on December 31 with 26 years of service to the KEYS community.

In addition, KEYS announced the following promotions: **Jesse Perloff** was promoted to chief financial officer. **Brittani Harden** has been promoted to supervisor of fleets and facilities. **Tyler Randolph** has been promoted to supervisor of purchasing. **Jeanette Williams** was promoted to supervisor of accounting. **Robbie Berger** was promoted to supervisor of generation. **Ranae Moore** has been promoted to customer services leader.

Lake Worth Beach Selects Former Mississippi County Administrator as City Manager

Carmen Davis, who spent nearly a decade running day-to-day operations in Hinds County, Mississippi, was selected by Lake Worth Beach city commissioners to replace the former city manager, who stepped down in June after nine years as the city's top administrator. Davis started her career in public service in her native Detroit as a city planner.

"I think it's an exciting time for the city to have an opportunity for a new commission, a new city manager," said Mayor Betty Resch. "We have a lot going on in the city and I think she will be up to the task."

Matthews Joins GrayRobinson

FMEA Legislative Counsel and Chief Lobbyist **Ryan Matthews** has joined the Government Affairs and Lobbying team at GrayRobinson. Matthews, a former Florida Department of Environmental Protection secretary, will join as a shareholder in the Tallahassee office. Matthews was previously a partner at Peebles, Smith & Matthews, which specializes in local government, utilities, environmental and infrastructure issues. Matthews will continue as lead lobbyist for the Florida Municipal Electric Association. ■

Washington Report

Here's a quick overview of what's happening inside the beltway of interest to public power utilities.

Federal Appropriations Update

Lawmakers are working to extend funding to keep the federal government open past February 18. The House Appropriations Committee introduced another stop-gap measure, which would keep funding through March 11, while Congress finalizes a permanent deal.

House Approves America COMPETES Act

HR 4521, the America Creating Opportunities for Manufacturing, Pre-Eminence in Technology and Economic Strength Act of 2022, is intended to strengthen U.S. technology prowess to counter growing competition from China. The Senate approved a bipartisan companion bill (SB 1260) last year. Differences between the two bills will now need to be reconciled to advance the legislation. Note that the House bill would impose a Public Utility Regulatory Policies Act section 111(d) "must consider" requirement for energy storage systems. APPA does not support these types of requirements.

Infrastructure Investment and Jobs Act

Visit our web page for summaries of the act, updates on implementation activities, funding opportunities for public power and guidance as it becomes available.

Meanwhile, at the Federal Energy Regulatory Commission…

- **Cybersecurity.** FERC proposed strengthening the Critical Infrastructure Protection standards to require Internal Network Security Monitoring at high- and medium-impact bulk electric systems — though FERC also seeks input on "the usefulness and practicality of implementing INSM to detect malicious activity" in low impact systems.
- **Transmission Task Force.** Representatives from FERC and the states met for the second time on February 16.
- **Hydropower.** An April 26 technical conference will discuss whether, and if so, how FERC should require additional financial assurance mechanisms in the licenses and other authorizations it issues for hydroelectric projects, to ensure that licensees can carry out license requirements and maintain their projects in safe condition.
- **Transmission Incentives.** APPA filed comments on approaches — particularly shared savings — intended to foster deployment of transmission technologies. While expressing support for grid-enhancing technologies, APPA reiterated opposition to adopting new incentive ratemaking mechanisms to promote their deployment.

Department of Energy Launches 'Building a Better Grid' Initiative

DOE announced a new initiative "to catalyze the nationwide development of new and upgraded high-capacity electric transmission lines." DOE "will work with community and industry stakeholders to identify national transmission needs and support the buildout of long-distance, high voltage transmission facilities that are critical to reaching President Biden's goal of 100 percent clean electricity by 2035."

U.S. Supreme Court to Review Scope of Clean Water Act Jurisdiction

The review of a lower court's decision regarding the proper test for determining whether wetlands are "waters of the United States" under the Clean Water Act will likely be heard in October. This will likely have significant implications for how federal agencies interpret the Act's scope, though it is uncertain how it will affect a current rulemaking. ■

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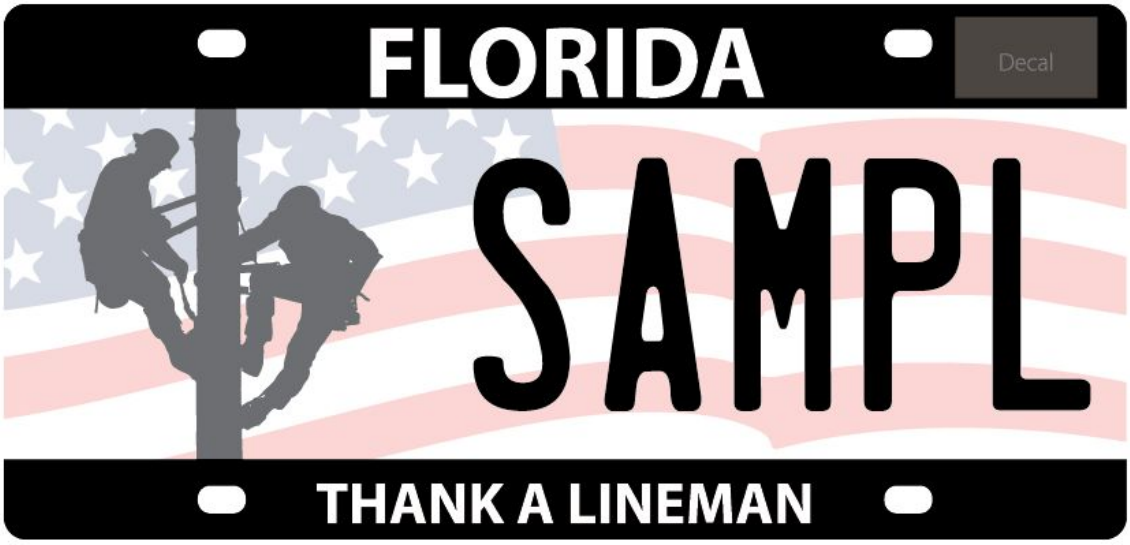
POWERING FLORIDA'S FUTURE

In 2020, the Florida Legislature created the Thank a Lineman specialty license plate for Florida drivers. Through extreme temperatures and storms, these men and women - and all those in the electric utility industry who support them - work tirelessly 24 hours a day, seven days a week to keep the lights on for Floridians.



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For each specialty license plate sold, $25 goes to the Lake-Sumter State College Foundation to support student scholarships for electrical distribution students at Lake-Sumter State College in Central Florida. Three thousand pre-sale vouchers must be sold before the plates can go into production.

Lake Sumter State College

FMEA
FLORIDA MUNICIPAL ELECTRIC ASSOCIATION

MONEY WELL-SPENT:

HOW INVESTMENTS IN ELECTRIC INFRASTRUCTURE BOOST RELIABILITY, RESILIENCY AND CUSTOMER SATISFACTION

by John Egan

THE OVERVIEW:

FMEA members are working to improve electric grid reliability and resilience.

THE GOOD NEWS:

In many cases, these added investments did not increase electricity prices on customers' bills.

MORE GOOD NEWS:

Small changes have led to big reliability improvements.

EVEN BETTER NEWS:

Customers and elected officials are noticing the improved electric service.

In Florida, tropical storms and hurricanes are a serious threat for half of the year, but public power utilities prepare year-round for natural disasters.

Municipal electric utilities are taking proactive steps to make their distribution systems stronger and more resilient to fulfill a critical mission: Keep the lights on 24/7 for 365 days of the year.

They are ramping up tree trimming, placing overhead lines underground, replacing substation relays, adding protective equipment to infrastructure in the field, installing new feeders, carefully inspecting utility poles and replacing many with stronger ones built to withstand the most intense hurricanes, and more.

> "Our elected officials, and customers, understand and appreciate our efforts to **strengthen** our utility assets for everyday **reliability** and against extreme weather."
>
> *– Dan Sabino, Assistant General Manager and Director of Engineering and Control at Keys Energy Services (KEYS)*

But developing a more resilient grid not only makes it easier to recover from severe storms. The six FMEA members we interviewed agreed that system-hardening has produced significant benefits even on blue sky days, including higher electric reliability and improved customer satisfaction.

Keys Energy Services

"Geographically, we live in a uniquely challenging environment," said Dan Sabino, assistant general manager and director of engineering and control at Keys Energy Services (KEYS). "Our poles are subjected to saltwater, termites, tropical heat, moisture and, of course, hurricanes."

The utility, which serves about 30,000 customers at the southernmost tip of the state, inspects every one of its wooden utility poles once every four years. Starting in 2015, KEYS began replacing weakened wood poles with either concrete poles or ductile iron poles, both of which are manufactured to withstand wind speeds of 150 miles per hour — a Category 4 hurricane.

"Our customers deserve the best service we can provide," Sabino said. "We go above and beyond the electric utility industry standard because our customers deserve more."

In late 2021, KEYS began a program to replace 208 wooden poles with ductile iron versions as a result of pole inspections. KEYS will replace an additional 86 poles in its fiber backbone. During severe weather, the new poles are designed to better protect fiber that ensures continuous communication with substations. That program is scheduled to be complete by the spring of 2022.

In another hardening step, roughly 425 wooden poles that serve critical facilities like hospitals, police stations, government buildings and first-responder facilities, are scheduled to be replaced by ductile iron poles, an investment of about $6 million.

Between 2007 and 2019, Sabino estimated KEYS spent approximately $20.5 million on distribution pole testing and replacement. The additions to harden the system did not cost customers extra money.

"We have been able to keep the delivered prices of electricity flat for five years as we hardened our system," Sabino said, adding that the outlays were funded from the normal capital budget.

KEYS has been working to storm-harden its electric system for at least 15 years, as its service area is particularly vulnerable to hurricanes.

The results have been impressive. As an example, Sabino recalled Hurricane Irma, a Category 4 hurricane that raked the KEYS' service area in 2017. "There was a lot of damage, but no storm-hardened pole fell."

Prior to KEYS' asset-hardening efforts, customer power outages averaged 79 minutes per year between 2005 and 2007. After years of system improvements and asset-hardening investments, the utility's reliability improved and outages fell to 47 minutes a year for the most recent three-year average, 2018-2020.

"Our elected officials, and customers, understand and appreciate our efforts to strengthen our utility assets for everyday reliability and against extreme weather," he said. "In terms of the elements, people who live here know what we're up against. Really, there's no end in sight for our storm-hardening efforts."

City of Alachua

The City of Alachua has taken several steps to invest in resiliency and improve system reliability. The utility spent about $2 million over the last five years to underground its distribution lines, estimated City Manager Mike DaRoza. The utility also recently completed work on a new $6.5 million substation that was strategically located to provide additional transmission capacity. A third step was to shorten the length of distribution feeders to reduce exposure to severe weather and enhance reliability.

Alachua is also planning to install TripSavers on overhead lines starting in early 2022. TripSavers, an advanced "self-healing" technology, prevent temporary faults on lines from becoming sustained outages.

DaRoza estimated the utility, which serves about 5,000 customers, has invested $9.6 million in hardening its electric distribution system over the last five years. He said larger commercial customers have expressed satisfaction with the utility's efforts and recognized the improvement in electric reliability.

All this was done without an increase in retail electric prices, DaRoza said, and there are no immediate plans to increase those prices.

For the last two years, Alachua's upgrades have taken place against the backdrop of COVID-19. Like all businesses, the pandemic required Florida utilities to establish workplace safety procedures, including adding personal protective equipment and new procedures for mutual aid during emergencies.

"As the mutual aid coordinator for the state's public power utilities, FMEA was the critical communications conduit to disseminate knowledge gained, share important information and update guidelines for mutual aid efforts," DaRoza said. "FMEA really stepped up to meet the informational challenge of COVID-19, which allowed our city to remain customer-focused, deliver superior services, and continue with our strategic capital improvement plans. Thank you FMEA!"

Beaches Energy Services

"As long as the lights are on, people are happy, and the lights are on more since we began hardening our system," said Allen Putnam, general manager of Beaches Energy Services. "We're getting more 'thank you' notes these days because our customers' electric service is less affected by inclement weather, trees and wildlife."

In the mid-1980s, about 80 percent of Beaches' distribution lines were overhead. The utility started an undergrounding program in 1997, and today the system is 85 percent belowground, which has improved reliability and resilience dramatically.

"Our reliability has improved greatly," Putnam said, "and customer satisfaction is up significantly as a result."

Don Cuevas, an engineering supervisor at Beaches, estimated the utility, which serves more than 35,000 customers, has invested $2 million to $3 million per year over the last 10-15 years to underground overhead lines, as well as replace underground lines and wood poles with concrete.

Another $2 million annually has been invested in modernizing substations and maintaining and repairing transmission lines utilizing drones and LIDAR (Light Detection and Ranging), a remote sensing method. Substation modernization involves replacing mechanical relays with electronic ones. The relay replacement "will be an ongoing process, extending as far as the eye can see," Cuevas said.

A few years ago, Beaches added a second transformer at its Guana substation and replaced its largest transformer at its Samson substation. A more than $10 million investment, these upgrades ultimately reduce costs and prevent power outages.

In a coastal area, utility aesthetics are particularly important to customers and the community. Undergrounding a system is a time-consuming, costly and often disruptive project, resulting in torn-up streets and sidewalks. Beaches has taken efforts to use directional drilling methods in its undergrounding projects instead of digging up the streets. This method helps keep costs down and results in minimal traffic disruptions. In addition, there have been no rate impacts as a direct result of the system-hardening improvements, Putnam said.

City of Wauchula

Like other FMEA members, the City of Wauchula regularly inspects its wood utility poles, replacing weakened ones, and it has stepped up tree trimming.

Since starting its wooden pole inspection program in 2017-2018, the city has replaced about 11 percent of its estimated 3,000 wooden poles.

To improve the utility's reliability, Wauchula added a second interconnection

LAKE WORTH BEACH ELECTRIC UTILITY BEGINS LARGE PROJECT

by Lake Worth Beach Communications

Lake Worth Beach Electric Utility has embarked on an expansive project to provide more reliable and resilient service for their customers.

As part of the ongoing System Hardening and Reliability Improvement Program, crews are working to install poles that can withstand a hurricane of Category 5 or higher with capacity distribution wires or "circuits," which will provide the future energy needs of Lake Worth Beach customers.

Accompanying this work, and a key component of the project, is the upgrading of the city's substations that feed the circuits.

Crews have begun work on a new substation at Seventh Avenue North, which will replace an existing substation built in 1970. The new substation will be able to withstand Category 5 hurricanes and is designed to handle the increased load from the city's growth over the past 50 years, including reserve capacity for future growth.

LE Myers, an electrical contractor and construction company, won the bid to carry out the construction. Their teams expect to complete the project around March 2022, in time for the upgraded circuits to tie in.

Lineworkers are working hard to minimize disruption while the work takes place. In many cases the utility's poles are in backyards, and crews use special tools to safely get in and safely remove the old pole, and then replace it with the new pole.

The new poles are either wood, concrete or iron, and all are designed to withstand the worst likely weather. Part of the work includes repairing any damage to customer property that may occur during the project.

This project will ensure that the city's infrastructure is ready for future storms and is the best possible investment for Lake Worth Beach customers, following the philosophy: "Do it once, do it right!"

at its one substation in 2009 and a third in 2020, at a cost of about $2 million each. When that third line was added, Wauchula also implemented a SCADA (Supervisory Control and Data Acquisition) system, which gives the utility better intelligence on the real-time health of its distribution network.

The utility has also invested in replacing inefficient equipment on its system. It recently replaced four aging oil-filled regulators, at a cost of roughly $2 million. The old oil-filled regulators contained polychlorinated biphenyls (PCBs), so replacing those regulators, used to cool equipment, was a step forward environmentally.

James Braddock, Wauchula's director of support services and internal auditing, noted the utility completed a fuse transformer coordination project a few years back, which improved reliability and efficiency.

Going forward, Braddock said another reliability and resiliency project will add capacitor banks near the end of its three distribution lines. Wauchula serves about 3,000 customer-owners.

These investments have had substantial impacts on Wauchula's reliability. Braddock, a Wauchula customer himself since 1989 and an employee since 2000, feels the impacts of fewer outages and shorter outages than in the past.

"There are some aspects of the asset-hardening journey that never end," he commented. "We have beautiful oak trees in our service area. We trim them more frequently now, but they grow back. We know people would prefer their trees to grow without trimming, but more than that, they want their power to be reliable. They seem to accept the trade-off."

City of Tallahassee

System-hardening is not limited to poles and lines. The City of Tallahassee recently added about 20 megawatts of generation at a substation to provide added assurance to critical loads, including a hospital and a police station.

"One of our bulk-power substations was served by a radial feed, and that substation provides power to a police station and hospital," said David Byrne, assistant general manager for electric and gas utilities. "If that radial feed was disrupted, the hospital and police station would lose power."

That happened in 2016, when Hurricane Hermine hit Tallahassee.

The substation in question, BP-12, was located in an urban area, and the extensive construction needed to add a second feeder would have been costly and disruptive, he recalled.

So Tallahassee went in another direction, adding new generation that could be used to island the critical loads at the hospital and police station during severe weather. The utility collaborated with the hospital, Tallahassee Memorial HealthCare, to build two 9.8-megawatt, gas-fired, reciprocating internal combustion engine (RICE) generators. The new units, constructed on land

donated by the hospital adjacent to the BP-12 substation, came online in 2018.

These "quick start" units can come online in less than 10 minutes. "These new units helped us avoid the cost and hassle of building a second feeder while giving us new generation that we needed anyway," Byrne remarked. "It was a great example of collaborating with a customer for mutual benefit."

"This was a fresh approach to resolving a traditional utility dilemma," Byrne said. "I could see a couple of places on our system where we could replicate what we did with the hospital, where we add quick-start generation that we need while improving system reliability and resilience for our customers."

Green Cove Springs

Trees used to grow less than 2 feet from power lines in Green Cove Springs. Not surprisingly, when the winds blew, trees swayed and made contact with power lines, causing outages.

But these days, trees are trimmed to a 10-foot circumference around poles, and outages are way down, according to Andy Yeager, electric director at the utility.

Outages have dropped by two-thirds since Green Cove Springs began its asset-hardening activities. "Tree-trimming has made a tremendous difference," Yeager said, estimating about 65 percent of the electric reliability improvements in Green Cove Springs stemmed from more aggressive vegetation management.

"People come to city council meetings and say, 'I don't know what you're doing, but the lights are staying on more now,'" Yeager continued. "Customers feel we have made great improvements."

The utility has done more than up its tree-trimming game. It has installed animal guards on all distribution feeders and laterals to keep squirrels and other wildlife off the equipment. It also installed a new feeder circuit and substation transformer at its single transmission-fed substation.

Three of its distribution substations got new underground takeoff feeder circuits as well, which provide an extra measure of reliability. The utility is implementing a SCADA system and upgrading its fuse coordination on laterals and equipment throughout the city to limit the areas of outages. And like all Florida public power utilities, it routinely inspects and replaces wood poles.

Yeager estimated the utility, which serves about 4,900 customer-owners, has spent about $500,000 per year over the last few years on asset-hardening. This year's budget includes a similar amount. Those outlays have not caused retail electric prices to rise, he added.

Across Florida, public power utilities are making investments large and small to meet the needs of their local communities, improve the customer experience and ensure the lights come on — and stay on — in all kinds of situations. ■

TRANSFORMING the Florida Public Power Customer Experience with AMI

by John Egan

Public power utilities across Florida have invested in advanced metering infrastructure to lower costs while adding service options that are geared to transforming the customer experience. Several are just beginning their deployments while others have been fully deployed for a decade or more.

"We still hear that advanced metering infrastructure (AMI) is too expensive, but our commissioners saw right through that argument," said Mike New, city manager of Newberry. "We're in the service business, and we should be pursuing cost-effective upgrades to improve service."

Newberry, with about 2,300 customers, recently started deploying its AMI system. But the city manager's comments were echoed by several other Florida public power utilities we interviewed.

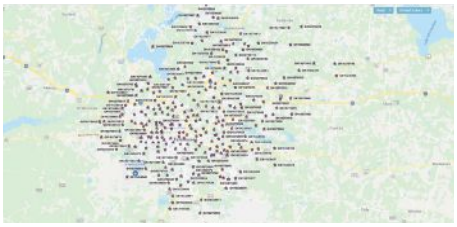
"If you want to eliminate manual meter reading, lower your costs, realign your processes and improve your customer's experience, AMI is the way to go," commented Dave Kus, Lakeland Electric's assistant general manager for customer service.

Deploying AMI was "money well spent," he continued. "It made us a better utility." Lakeland Electric's AMI system has been up and running for nine years. The utility serves about 130,000 customers.

The City of Tallahassee, which serves about 124,000 electric customers, started adding AMI in 2007.

"AMI is now a way of life for us," said Chief Customer Officer James Barnes. "If you're in the service business, the journey has no ending date. If you do see an end, you're probably looking at the wrong target."

Utilities across the country have been investigating ways to transform their customers' experience for the better part of two decades. The deployment of AMI, and some of the additional service options built on AMI, are providing public power utilities a once-in-a-generation opportunity to



fundamentally change the way customers consume utilities' products and interact with them.

"In order to meet the demands of customers, we needed near-real-time data," Barnes said. "We are leveraging AMI to provide more options to customers. Customer expectations continue to get higher and higher. They think, 'If I can do other things online, why can't I interact with my utility company online?'"

AMI allows utilities to be much more responsive to customers. Susan Postans, vice president for customer service at Kissimmee Utility Authority (KUA), said AMI enables the utility to perform remote meter operations within 60 seconds. Previously, it would take 30-60 minutes to roll a truck out to the customer's property.

"Now, we rarely receive calls from customers asking when we will be out to their home to turn on the power," Postans added. "Also, we actually know a customer is out of power before many of them … do, and text messages go out automatically to customers during an outage."

Her colleague, Lowell Knollinger, manager of support services, noted that their customers' ability to see their electric usage in near-real time is another benefit of KUA's system, which was fully deployed by April 2021. The KUA system has an online portal that customers can use to monitor their usage.

"They can see when the kids come home from school at 3 p.m., electric usage goes up because the air conditioning is turned on," Knollinger said.

"With our AMI system, customers can take more control of the way they use our product. They can monitor their own consumption and they now have the information they need to change their usage, if they want," Postans said.

Other public power utilities reported that the ability to promptly send customers high-usage alerts, for either electricity or water, was helping transform the experience and expectations of customers and also save them money. Others mentioned the enhanced employee safety provided by AMI: Because they no longer travel to a customer's home, meter readers and field technicians no longer have to interact with angry customers, confront dogs or risk injuries while on a customer's property.

Lakeland Electric has used its AMI system to facilitate customer experience upgrades including prepaid metering; customer energy efficiency education; alarms for high usage, meter tampering, meter changes, and irregular conditions; multiple price options; and demand management programs.

Transforming Operations

Florida's community-owned electric utilities with AMI agree there are many internal operational benefits that ultimately translate into better service at a lower cost.

These benefits include streamlined processes, reduced call volumes to the contact center, fewer truck rolls and better-quality data on customer usage that will allow the

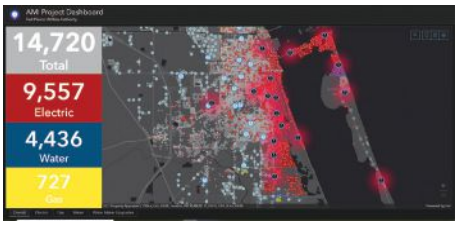
use of advanced data analytics to make better load-forecasting decisions.

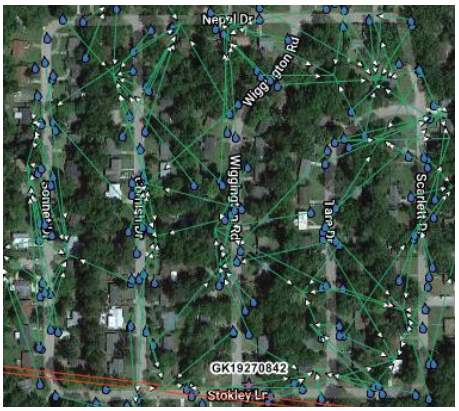
All of that works to keep electric prices as low as possible.

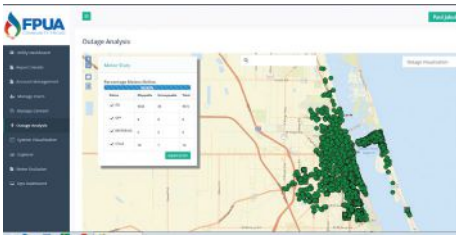
"Our inbound call volume declined from approximately 500,000 per year before AMI deployment to about 330,000 in fiscal year 2020," Kus said. "At around $4 per call, that's a significant cost saving. In fact, it exceeded our expectations."

AMI has allowed the Lakeland utility to limit sending trucks to address high bills, theft, meter rereads and bill adjustments. "The cost-savings from avoided truck rolls are substantial," he said.

Because customers can perform many functions once performed by customer service representatives (CSRs) in the contact center, Lakeland Electric was able to shorten the hours of the Call Center. "Our CSRs used to be on duty until 8 p.m., but we shortened that to 6 p.m. because customers don't need to call us — the meter does."



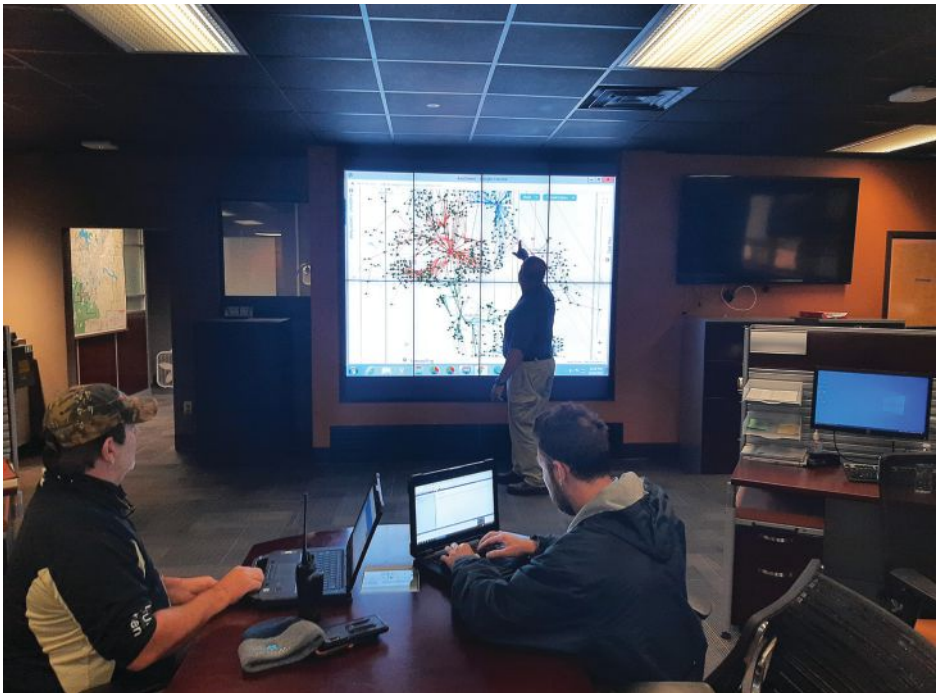




At What Cost?

AMI is not cheap, but those we interviewed agreed the value it created greatly exceeded its cost.

"AMI is the direction that the industry is going," said Lynne Mila, utilities compliance officer for the City of Clewiston. "Customers expect this type of service. AMI is a tool with great benefits for operations as well as customers. To the extent that lower costs help keep retail electric prices down, that's great."



Lakeland Electric's AMI deployment cost $35 million, but nearly half of that — $14.8 million — came from a federal grant under the American Recovery and Reinvestment Act (ARRA) of 2009.

The ARRA grant program closed down years ago after making about 100 grants to utilities to facilitate advanced digital meters and AMI. But other grant sources are available. Clewiston, with 4,200 customers, got a grant through the federal government's COVID-19 relief program last year, reducing their out-of-pocket costs to about $1.35 million, Mila said.

And the just-enacted $1.2 trillion federal bipartisan infrastructure law may contain grants or low-interest loans for cities wanting to deploy AMI.

KUA's Postans said the utility's AMI deployment cost about $18.5 million. It received

no grants, but the utility planned for the system by putting aside some money each year.

Reengineering Processes, Realigning Resources

KUA took a sensible approach to business process reengineering and potential job losses stemming from AMI deployment by taking the opportunity to reclassify certain positions.

"We used the deployment process to assess what the organization needed," Postans said. "We eliminated some jobs, reclassified some and created some new positions throughout the organization.

"For example, when we eliminated the meter reading function, we lost important eyes in the field. So we created the new position of 'Field Inspector,' and people in that position check our equipment on a regular basis and may engage in face-to-face interaction with customers."

KUA also created data analyst positions so it could extract value from all the new data it was receiving from customers.

Lakeland Electric's Kus said his "bible" during that utility's AMI deployment was *Reengineering the Corporation*, written three decades ago by Michael Hammer and James Champy. "I still carry that around with me, and it's as true today as it was back then."

One of the book's takeaways is that companies need to change their business processes and organizational structures when making a strategic technology upgrade.

Tallahassee's Barnes cautioned utilities against underestimating the challenges of business process reengineering and organizational change while deploying AMI.

"If you don't have an organizational change plan to bring your employees along, your AMI deployment will be dead in the water," said Barnes, who was hired in 2007 to oversee Tallahassee's AMI deployment. He recalled the Tallahassee utility did not commit to no staff reductions when it undertook its AMI deployment. But he said the deployment triggered a process where all employees were urged to re-envision their jobs and transition into other needed positions.

Most utility employees — indeed most employees of any enterprise — don't welcome change, Barnes continued, adding that unless employees feel they are a meaningful part of the process, they likely will "subliminally sabotage" the deployment. "You must work hard to get employee buy-in at the front end. That includes breaking down silos within your organization."

Organizations should try to retrain employees who want to stay, said Barnes. "Tell your people what you are doing and why, and when the changes will take place. It's never too early to begin the employee buy-in process."

He recommended managing the deployment with a multigenerational employee team that reflects the customer base.

"Those closest to the work know where the problems are and how they could be fixed," Barnes said. "Their knowledge should be used to improve the organization."

Paul Jakubczak, P.E., director of electric and gas systems at Fort Pierce Utilities Authority, agreed. "We solicited employee ideas for ways to increase the value of the AMI system," he said. "Those with boots on the ground have the best ideas." FPUA serves about 29,000 customer-owners.

Communications – Internal and External

Your leadership team may talk the talk. But an AMI deployment will test whether it walks the walk.

Communications — to customers and employees — are the critical determinant of whether an AMI deployment will soar or sink, according to the industry experts interviewed for this article. They say words are important, but deeds are even more crucial because they demonstrate a company's values.

"Open, honest, and consistent communication with your employees and customers is the key to success," said KUA's Postans. "We identified the 35 jobs that would be affected by an AMI deployment, and I personally met with each of those employees on multiple occasions. We made sure they were the first to know about

all aspects of the deployment. You need total buy-in from everyone in the organization, including the board, if you want to succeed."

"We didn't have all the answers at the time, but we showed by our actions we were trying to do the right thing." Postans added that the way KUA treated its affected employees helped build employee buy-in for the deployment.

For example, of the 35 jobs that KUA identified as being affected by the deployment, nearly all of those employees were redeployed to other positions. Only one employee retired and two left on their own.

"Employees throughout the organization were anxious about the potential for job loss, and they empathized with the employees whose jobs were affected," said Postans. "We tried to treat affected employees fairly, and I think that reduced the anxiety of other employees."

She also was part of a weekly meeting involving representatives from KUA's other departments, including Information Technology, Operations, Finance and Customer Service, to troubleshoot and coordinate the rollout. She said meetings also were held twice weekly with the vendor to ensure small problems did not become huge ones.

New, city manager of Newberry, said the city wanted broad employee buy-in for its AMI deployment, so employees played a role in selecting the system. "Employees became enthusiastic about AMI because it would enhance the quality of service."

FPUA's Jakubczak agreed.

"We did not move to this technology as a way to eliminate the meter reading jobs," he said. "We cross-trained our meter readers to perform other work. We wanted to keep these skilled employees and employees were glad we were looking out for them."

Jakubczak said meter readers were retrained as customer service technicians. In that role, they visit a customer's residence to answer questions about high bill complaints or meter problems. The technicians also perform energy or water audits to help customers conserve resources and save money.

"These new positions allow us to be more proactive and engaging with our customer-owners," he said. "Communication is key to everything." ■

How Florida Public Power's Investments in Cybersecurity Protect Customers and the Grid

by Dave Heller

The cyberspace battles of the 21st century are relentless, and they are waged by increasingly sophisticated and malevolent hackers striving to steal sensitive data, take control of computer networks or carry out a host of other digital crimes, often in pursuit of a payout.

Ken Zambito, vice president of transmission at Orlando Utilities Commission (OUC), gets a glimpse of this digital combat every time he steps into the utility's control room.

"You always have people prodding at your system, looking around, checking firewalls, and they do it to everybody. It's not like they're only looking at OUC for vulnerabilities," Zambito said. "You have firewalls for protection, but that doesn't mean people can't bang against them looking for access. That's all going on constantly."

Target: Critical Infrastructure

The Colonial Pipeline ransomware hack in May 2021 signaled a grim new chapter in cyberattacks against critical infrastructure in the United States. Cybercriminals shut down the 5,500-mile oil pipeline — the nation's largest — for about a week, causing fuel shortages, panic-buying and higher gas prices.

The episode led to one of the largest payouts in history. Colonial paid more than $4 million in Bitcoin to the hackers; the U.S. Department of Justice recovered just a portion of the ransom.

In a separate attack last year, a hacker used remote-access software to infiltrate the network of a water treatment plant in Oldsmar, Florida. The attacker was able to raise the level of sodium hydroxide in drinking water to dangerous levels, but a plant operator immediately noticed the change and fixed it.

The Oldsmar incident, which happened just 120 miles from OUC, prompted Zambito to huddle with the utility's cybersecurity team to see if they could glean lessons from the attack.

"We asked, 'If somebody attempted to do that here, what would have happened? Would we have had the same situation? Would we have had to rely on an operator to notice it? Or would something else have caught it?'" Zambito recalled. "We conducted an exercise to try to learn something."

Learning something new in the ever-changing field of cybersecurity, and then implementing lessons, is taking on increased urgency.

Growing Concerns

In a 2021-2022 Black & Veatch Electric Report, utility stakeholders ranked their top challenges and cybersecurity jumped from sixth place to No. 2 over the past year. When the question was narrowed to the top challenges for grid automation, cybersecurity topped the list at 46 percent.

In Jacksonville, where JEA serves about 500,000 electric customers, Chief Administrative Officer Jody Brooks said the utility continually spends a lot of time, money and energy to build up its cybersecurity.

"We're doing everything we can to protect our assets and customers," Brooks said. "It's an evolving process for security against both cyber and physical threats. We believe the dollars we spend on extra tools to make our system safe is money well spent."

Utilities' Cybersecurity Evolution

Historically, efforts to make the electric grid more secure and stable escalated following the Northeast Blackout in 2003.

Greg Ozbun, assistant general manager at Tallahassee Electric and Gas Utility, clearly remembered that day in August when a chain-reaction power outage affected more than 50 million people in eight states and parts of Canada.

"That blackout resulted from a series of issues like not coordinating with your neighboring utility on relay settings, SCADA (supervisory control and data acquisition) system updates, vegetation management, and independent operating authority," Ozbun said. "Nowadays, an outage of that scope sounds impossible. But it happened, and it was bad."

The blackout prompted a plan to develop better standards and collaboration in the industry.

The North American Electric Reliability Corporation (NERC) developed Critical Infrastructure Protection, or CIP, standards designed to secure the grid. CIP standards became mandatory and enforceable in 2007.

Those new rules marked a turning point for the City of Tallahassee and other utilities because it pushed them to ramp up their cybersecurity protocols.

Tallahassee committed itself to making serious investments, Ozbun said, that would exceed CIP standards.

"We have very high security designed like the layers of an onion. There are multiple layers of security in that onion, and we don't connect directly to the internet so you can't do a lot of tasks that you could do on a normal network," he said. "But the network is better protected from malicious actors who configure bots to constantly bang away at networks hoping to find an opening."

In the 1990s, Tallahassee made a visionary investment that created one of the most effective protections against cyberattacks: a private fiber-optic network used exclusively for the electric system. It's a fast, secure network connecting every piece of the city's grid.

"We run fiber to all of our substations and remote areas, and the network is not shared with any other department," Ozbun said. "It also helps us follow the CIP standards more easily. The decision to install fiber was very future-focused."

Investing in a Cyber-Savvy Staff

Municipal utilities also have invested heavily to expand the size and scope of their cybersecurity teams.

In Orlando, Zambito has doubled the size of the OUC team that handles operational technology applications and infrastructure, while the utility has created a separate department to focus solely on compliance.

Many of those investments stem from mandates instituted by the federal government, often unfunded. That can create thorny budget dilemmas for community-owned utilities, which pride themselves on charging lower rates but also operate with limited resources.

"You have to make the decisions," Zambito said. "You've got to make the investments or face fines, so you have additional costs to meet compliance. That's just how it works. You figure out how to pay for it, and then it does get passed on to ratepayers."

Zambito sees it as a proactive investment. Customers can pay now to enhance cybersecurity or risk paying more later due to a costly cyberattack.

Another common investment among municipal utilities aims to change employees' behavior. That's a critical goal because the biggest threat to a utility, or any organization, is its own employees — not by intentional sabotage but from clicking on the wrong links.

"The ransomware and phishing capabilities of hackers are the biggest threat," said Scott Bishop, manager of emerging technology at Lakeland Electric. "People are on their computers all day long, often receiving nefarious messages and there's a risk of activating insidious viruses when they're inside our network. We employ preventive tools and training, and we're always prepared to respond quickly."

To prevent that kind of aggravation or worse, Lakeland Electric works hard to develop a "culture of cybersecurity." It's a multifaceted campaign, including reminders on monitors and posters all over the facility.

The campaign also includes employee training on how to spot phishing emails. Lakeland has hired a vendor to help raise awareness about security threats, and that education includes sending fake emails to test employees on whether they'll click on the wrong links.

"The message might say, 'Your Amazon packages are three stops away, so click here to verify your address.' If you click on it, you end up taking a class," Bishop said. "We phish ourselves hoping you'll start paying attention to emails you're not expecting. We want to promote a culture that encourages people to think about security."

Creating a culture of cybersecurity is a common practice among FMEA members.

Brooks said JEA also contracts with a vendor to conduct security assessments and phishing exercises.

"Some of the assessment work that outside vendors perform is not cheap, but it's an extra resource we need," she said. "We make sure the assessments and other things we do internally and externally all lead back to the customer."

That's the bottom line for Ozbun in Tallahassee, where security deployments include: badges, PINs, multifactor authentication, enhanced hardware and software, RSA tokens — physical fobs that generate a random code every 60 seconds or on another time interval — and many more confidential tools.

Ozbun wants every security investment to pay off for customers so they have confidence in the electric system's reliability.

"When they turn on their light switch, the lights come on. That's how they benefit from effective cybersecurity," Ozbun said. "If you're lax about it, then in the long run it's going to affect rates. It's better to be proactive than reactive."

Zambito said OUC will continue to upgrade its electric system with the latest technology.

"Who even knows what the next devices will be?" Zambito wondered. "We'll be making more investments and doing whatever we need to do to keep up with hackers because as they get better, your own security has to get better."

Bishop said Lakeland Electric is making investments to complete everything on its long-term plan for cybersecurity.

"We follow our strategic roadmap in everything we do," Bishop said. "The CEOs of the future will have to really understand technology because it all becomes more ubiquitous every day. The implementers of the world will have to have a core knowledge of security as well as being able to envision, what new thing can we do?" ■

PROTECTING HONEYBEES, SEA TURTLES, CATTLE AND OSPREYS:

DRONE USE BRINGS UNEXPECTED BENEFITS TO FLORIDA COMMUNITIES

by John Egan

Drone cameras are changing the way Florida's municipally owned electric utilities are performing regularly scheduled maintenance and line repairs. Drones help boost electric reliability while lowering costs.

Lineworkers love them, customers are curious and there are plenty of unexpected benefits to using these aerial troubleshooters.

Beaches Energy Services: The Time Was Right to Use Drones

Allen Putnam remembers the moment he knew it was time to start using drones at Beaches Energy Services.

After Hurricane Matthew hit northeast Florida in 2016, Putnam — director of the utility serving about 35,000 customers in Jacksonville Beach, Neptune Beach, Ponte Vedra and Palm Valley — needed to do a damage assessment of the system's 23 miles of transmission lines.

Unfortunately, Matthew had turned about 75 percent of the land under transmission lines into a swamp with waist-high water, alligators, snakes and assorted submerged dangers.

The traditional approach to damage assessment, to lay down heavy-duty 10-inch-by-10-inch construction mats onto which bucket trucks and heavy equipment could climb, was a non-starter in such deep water. Beaches needed an alternative — and quick. Beaches issued a request for proposal for transmission inspection services. "We got lots of bids from contractors that offered to do a pole-by-pole inspection by crews with bucket trucks," recalled Putnam. "I'm not sure how they would have done that, given the swampy conditions under the transmission lines. They gave us bids that exceeded $600,000. But a drone operator offered to do the work for less than $25,000, and we got more and better detail faster than we would using any other method."

The experience with the contract drone operator was so successful that Beaches decided to buy its own drones to better prepare for future storms and other routine purposes.

"Using drones to conduct storm damage assessments makes so much sense," Putnam said. Beaches Energy first utilized its drones for damage assessment after Hurricane Irma in 2017.

"We looked at capabilities and costs before buying our first drone. Once purchased, we trained two or three line crew employees and had the drones registered through the FAA. The first model we purchased was about $1,000 and our second drone with added capabilities was about $3,000."

Beaches uses its two drones between 40 and 80 hours per year, estimated Wayne Hughes, the utility's construction and maintenance supervisor, but that number varies depending on the number of hurricanes that make their way up to far northeast Florida. Images from the drones are used as part of "before and after" presentations on the utility's system to its city council.

But Beaches has found other uses for the drones. The utility lends its drones to the City of Jacksonville Beach for pier inspections and crowd control during large public events.

Beaches' drones also are used by the Florida Sea Turtle Breeding Patrol to protect newborn sea turtles as they hatch.

"At night, lights on the beach can disorient newly hatched turtles," Hughes explained. "Instead of instinctively heading into the water, they move towards the lights on the beach or even the nearby streets. The breeding patrol uses drones to monitor the progress of the newly hatched turtles and the patrol can intervene if necessary to redirect the turtles back to the water.

"It's good public relations and a worthy cause," Hughes said.

Beaches plans to purchase two more drones in 2022 or 2023, and may place them in trucks to limit truck rolls for service calls. The utility could also use them as part of a digitalization effort that includes digitizing the map of their system assets, updating their geographic information system (GIS) and deploying Light Detection and Ranging (LIDAR) to obtain a more detailed perspective of the physical clearance between transmission and distribution (T&D) assets and trees to help calibrate vegetation management efforts.

The utility also has plans to use its drones to perform preventive maintenance at its substations. The cameras can provide very detailed looks at substation connections that may be going bad and insulators that may be cracking. Outfitted with an infrared (IR) lens, a drone can detect heat signatures on equipment that could serve as an early warning sign the equipment needs to be repaired or replaced. So by facilitating preventive maintenance, Beaches' drone fleet can help improve electric reliability too.

Utilities Commission of New Smyrna Beach: Drones Change the Game

Bud VanArsdall, a lineworker for the Utilities Commission, City of New Smyrna Beach (UCNSB), is delighted his utility began using drones in 2020.

"Drones are changing the game," he said. "You know what you're in for before you start a job.

"When it comes to power line inspection, especially in inaccessible locations or storm restoration, we can accomplish in two hours [what] would have taken days in a bucket truck," he added. "And there's safety benefits too from not having our linemen go up in a bucket truck until the drone footage is accessed."

VanArsdall oversees the utility's vegetation-management contractor that maintains line clearances to minimize vegetation-related outages, improve reliability and reduce restoration time.

He recalled that tree trimmers found a massive honeybee hive in a large oak tree near a distribution line that fed the city's airport. Hundreds

of bees had hollowed out a section of the tree for their nest, and long branches posed a threat to distribution lines underneath.

The tree needed to be significantly trimmed, but the size of the nest meant moving it would pose serious safety risks for the tree trimmers and line personnel. With the assistance of a certified beekeeper, a lineman and an arborist, the large hollow bough that harbored the largest honeybee nest in Volusia County was safely removed and the bee colony was virtually undisturbed.

Even though the beekeepers, lineman and tree trimmers wore personal protective equipment (PPE), if the bees were angered, there was a risk they could attack all involved.

UCNSB's drone came to the rescue. Tree trimmers were able to use the images to plan their cuts without disturbing the nest.

"A world without honeybees would also be a world without fruits, vegetables, nuts and seeds," UCNSB commented in its "Save the Bees" video that won an American Public Power Association Excellence in Public Power Communications Award in October 2021.

"The Utilities Commission of New Smyrna Beach is committed to maintaining service reliability and being environmentally conscious," VanArsdall said.

He said the utility, which serves about 30,000 customers near Daytona Beach on the Atlantic coast, uses drones to do routine and proactive operations and maintenance (O&M) work, such as to monitor the condition of wood poles, check the setback for a line where trees may need to be trimmed, identify cracked insulators and scope out work that is hard to access either because of limited clearance space or because there's no road underneath a line.

Although VanArsdall recalled that no UCNSB lineworker has ever been seriously hurt climbing a pole, "we've had some close calls."

Alternatively, using helicopters to inspect lines also poses safety risks and is exorbitantly expensive, upward of $15,000 per day.

UCNSB maintains about 21 miles of transmission line and 230 miles of distribution line, all currently under the watchful eye of UCNSB's drone.

A lot of UCNSB's transmission lines run over cow pastures. Using a helicopter to do a transmission line assessment could frighten the cattle and cause a stampede. "You don't have that problem with a drone," VanArsdall said.

"Woodpeckers wreak havoc on our wood poles, and our linemen are excited about not having to use bucket trucks when there are safer alternatives available," he added.

Brent Eite, a contract videographer working alongside VanArsdall, said drones have become much more affordable in recent years. The model UCNSB uses costs about $1,000.

"Every day drones get smaller, faster, cheaper and better performing — mainly in the length of time they can fly and the resolution of the camera," Eite said.

VanArsdall estimated that since UCNSB started using drones in 2020, vegetation-related electric outages have dropped sharply, by as much as 40 percent. Not all of that can be attributed to drones, but a lot of it can, he added.

To any electric utility considering using drones, VanArsdall said, "Go for it, 100 percent. The newest models capture images in 5K pixels, and when you zoom in, you can see a blade of grass."

JEA: Linemen Now Spend Less Time Inspecting Beaver Dams and Osprey Nests

Like UCNSB and Beaches Energy Services, JEA in Jacksonville uses its eight drones to conduct post-storm damage assessments on its T&D system, perform scheduled maintenance inspections and facilitate better vegetation management, as well as for

preventive maintenance at substations and generation facilities.

And like its FMEA brethren, JEA is using the drones for other purposes, including checking on osprey nesting habits on their infrastructure and identifying beaver dams that hinder water flow.

"Beaver dams can block water in creeks/tributaries and wetlands of northeastern Florida, impeding our ability to manage nearly 5,000 acres of timber," said Kim Wheeler, P.E., a 30-year veteran of JEA. "By flying a drone over wetlands, we can identify beaver dams that need removing. Also, during the spring, when ospreys nest in and around our facilities, using a drone to assess the nests prevents the need to utilize a line crew and a bucket truck to check on the nests.

"If there are eggs in a nest, or newborn ospreys, we won't work on that structure," she said. "It's so much more economical, efficient and safer to fly a drone up there than it is to bring a line crew and bucket truck into the field to check the nest."

Although ospreys are not on the endangered species list, people in Florida have a soft spot for the birds, who also are known as "fish hawks" for the way they use their razor-sharp talons to pluck unsuspecting fish out of the water.

"A lot of our T&D lines parallel or intersect with railroad rights of way," Wheeler continued. "Prior to our use of drones in 2017, whenever we inspected our equipment, we used a line crew and bucket truck, and we also needed to contract with a railroad flagman. Flagmen don't come cheap. Our use of drones has made that a thing of the past."

As for drones, JEA is interested in anything that keeps their employees out of harm's way and even out of a bucket truck. And if it expedites power restoration after a storm, or lowers costs compared to traditional methods, those are added benefits, she said.

JEA is a four-service utility, providing electric service to about 480,000 customers, water service to approximately 360,000 customers, sewer service to roughly 280,000 customers and reclaimed water service to about 15,000 customers.

Wheeler said JEA also uses a drone with a high-definition camera and an infrared camera to identify "hot spots" and damaged equipment. Currently, the utility uses contractors to perform LIDAR surveys along its electric lines. In the future, JEA hopes to utilize a LIDAR camera in-house. LIDAR cameras can collect data points that enable "root ball analysis" along electric lines. That analysis calculates the distance between trees and power lines and is used to make preventive tree-trimming decisions.

"If a 75-foot-tall tree is located 25 feet away from our lines, and that tree falls during a storm, it will likely come into contact with our lines. Therefore, the root ball analysis tells us which lines could be impacted if nearby trees are uprooted during a hurricane."

JEA also uses LIDAR to conduct "sag and sway" analyses to understand how much a conductor could move in the wind in order to perform preventive maintenance.

Like Beaches Energy Services, JEA began using drones after a recent hurricane. "The water was high, there were no lights, and our employees faced unsafe power-restoration conditions in the field," Wheeler recalled.

The utility also displays its drone air force at school and community events, where Wheeler said, "The kids love them, there's a total 'wow' factor."

Drones are the kind of next-generation technology that tech-savvy employees love. As utilities continue their digitalization journey, using drones may present opportunities in recruiting the next generation of employees. ■

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