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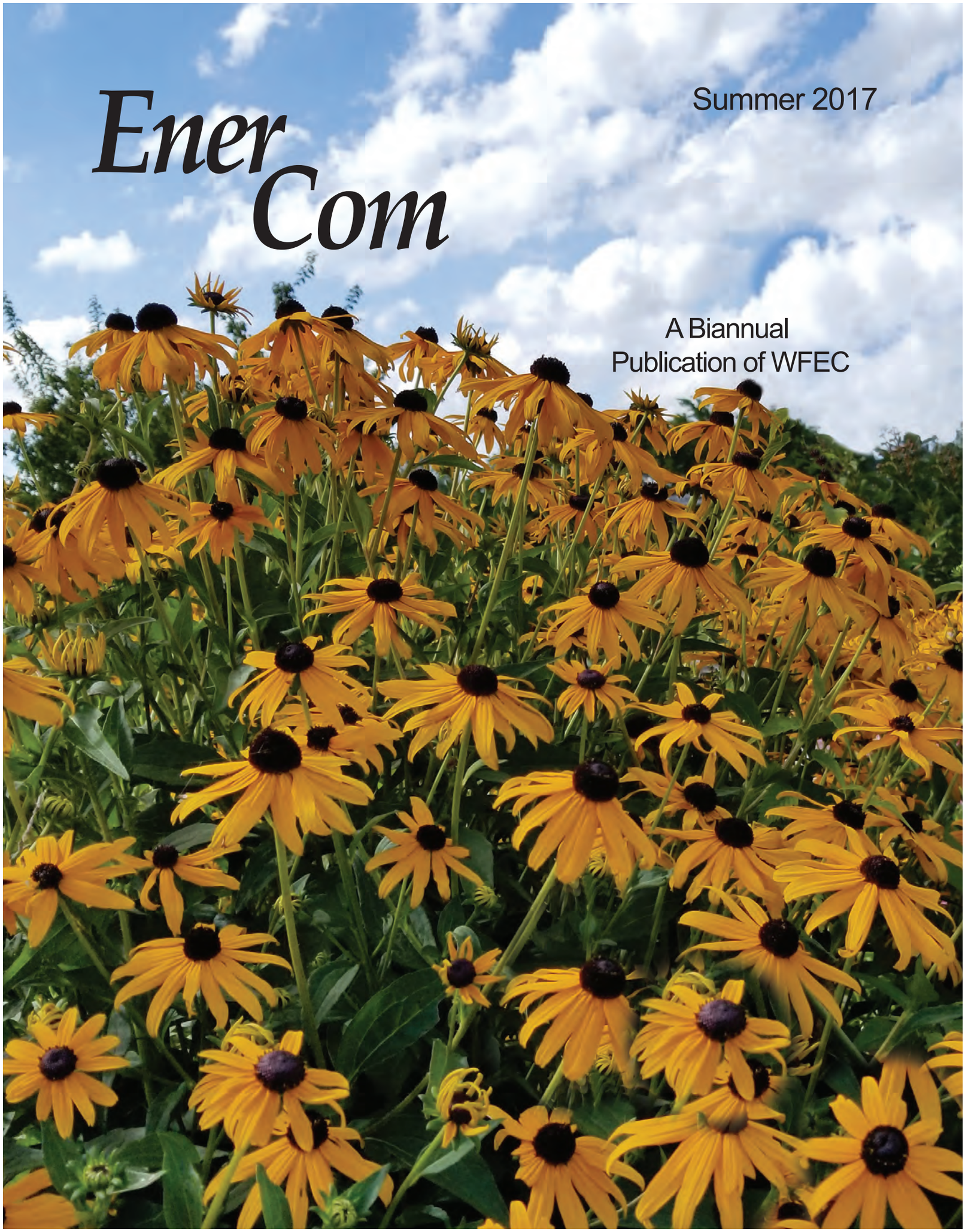

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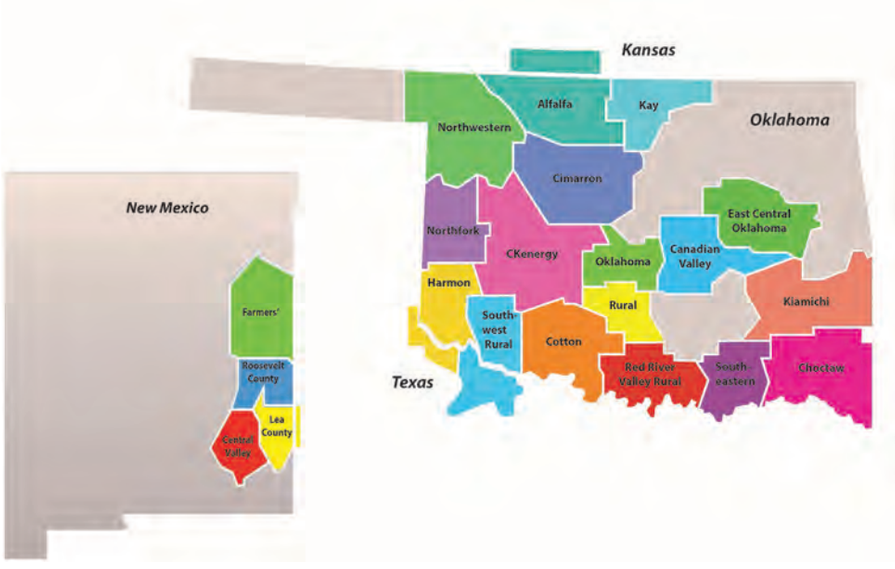

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SPP & member companies coordinate flow of electricity throughout 14 states

The Southwest Power Pool, or SPP, as it is more commonly called, is a familiar acronym for WFEC employees and its cooperative members. It fits well into the vast list of other abbreviations of the electric utility industry. Even though "SPP" may be said and written daily within the company, those not working directly with the organization may not fully understand its connection with WFEC.

This article will provide a basic overview of the structure of SPP. For some, this information is not necessary as they are directly involved in some way with SPP, whether serving on a committee or taking part in their drills and exercises. For others who are new to the electric utility industry, this will hopefully clarify some roles of SPP and how they relate to WFEC.

Drastic changes have occurred in the past few years regarding the purchase and delivery of power. These changes are complex in nature, and are difficult to understand and explain.

What is SPP?

Southwest Power Pool, Inc., a nonprofit organization founded in 1941, is one of nine Federal Energy Regulatory Commission (FERC)-approved Regional Transmission Organizations (RTO) and one of eight North American Electric Reliability Corporation (NERC) Regional Entities (RE). As an RTO, SPP ensures reliable supplies of power, adequate transmission infrastructure and competitive wholesale prices of electricity. The SPP RE oversees compliance enforcement and reliability standards development.

SPP manages the electric grid and wholesale power market for the central United States. SPP and its diverse group of member companies coordinate the flow of electricity across approximately 60,000 miles of high-voltage transmission lines spanning 14 states. The company is headquartered in Little Rock, Ark.

Fast Facts - An Overview of the SPP System

SPP has members in 14 states:
Arkansas, Iowa, Kansas, Louisiana, Minnesota, Missouri, Montana, Nebraska, New Mexico, North Dakota, Oklahoma, South Dakota, Texas and Wyoming.

- Service territory: 546,000 square miles (approx.)
- Substations: 4,835
- Generation plants: 790
- Miles of transmission: 65,755
- Coincident peak load: 50,622 MW (July 21, 2016)
- Generating capacity: 83,945 MW
- Energy consumption: 266.4 TWh

megawatt (MW) / terawatt hour (TWh)

Whos' Who at SPP:

- FERC is an independent federal agency that regulates the transmission and wholesale sales of electricity in interstate commerce, governs the rates, terms and conditions of SPP through its Open Access Transmission Tariff (OATT or Tariff), in addition to the Membership Agreement and Bylaws.
- NERC is the electric reliability organization for North America, subject to oversight by FERC and governmental authorities in Canada. NERC's jurisdiction includes users, owners and operators of the bulk power system.
- Independent system operators/regional transmission organizations (ISOs/RTOs) are, for example, the "air traffic controllers" of the electric power grid. ISOs/RTOs do not own the power grid; they independently operate the grid minute-by-minute to ensure that power gets to customers and to eliminate power shortages.

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SPP articles compiled by:
Sondra Boykin
Sources: SPP website & presentations

Airport analogy explains SPP roles

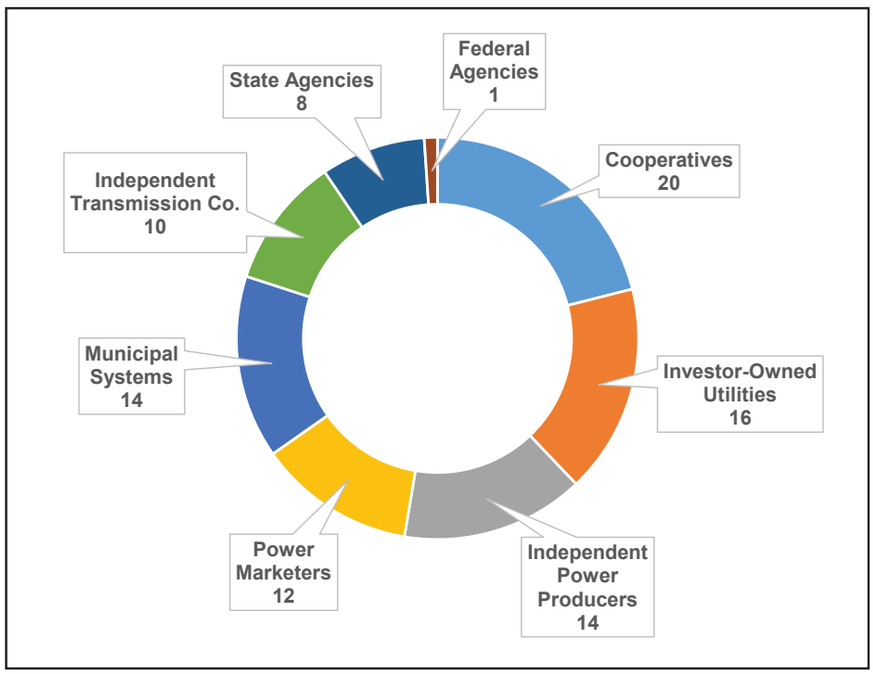
One analogy used by SPP relates their "reliability coordination" duties to the job of an air traffic controller. SPP dispatchers monitor the grid 24 hours a day, seven days a week, 365 days a year, just as air traffic controllers monitor the skies. Problems are anticipated, with preventative action taken if necessary.

Using the same airport analogy, SPP acts somewhat as a "sales agent" through the administering of transmission services. Reserving transmission service is like buying a plane ticket to reserve a seat. A tag is generated when transmission is bought or sold, which is comparable to a boarding pass.

A schedule is then created from the tag. An approved schedule basically can be equated with sitting on a plane in this comparison. Once a schedule is approved, generators move to provide energy for the transaction, while ensuring that the amount of power sent is coordinated and matched with power received.

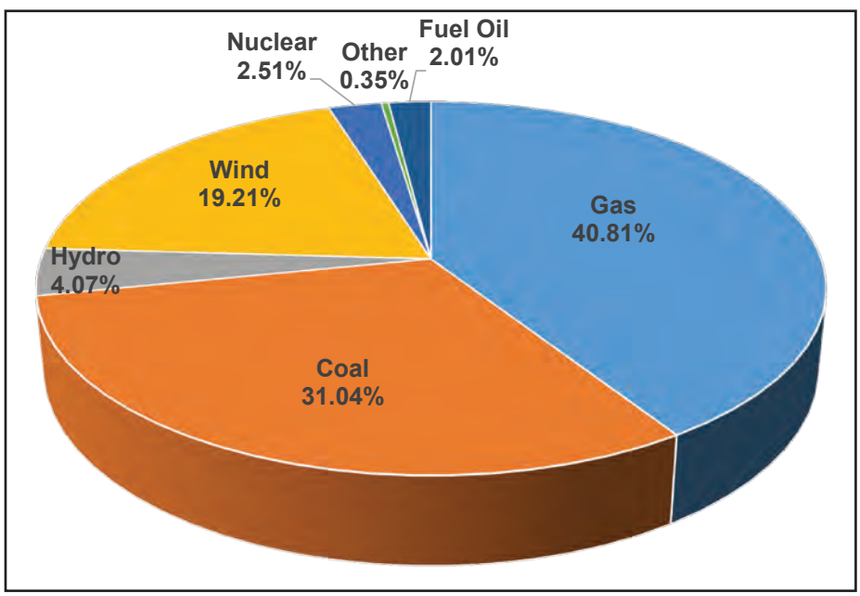
SPP Members

As of April 12, 2017



Sources:

Information taken from SPP presentations during recent Communicator's Conference.



SPP's Energy Capacity by Fuel Type*

Figures refer to nameplate capacity as of Jan. 1, 2017

Overview of WFEC's role within SPP since opening of Integrated Marketplace

One of the most unprecedented changes in the history of Western Farmers Electric Cooperative (WFEC), regarding how load is served, occurred in 2014, involving the impacts of the eventful opening of the Southwest Power Pool's (SPP) Integrated Marketplace (IM).

On March 1, 2014, WFEC began offering to sell all available resources into the SPP IM and purchase all energy required for load commitments from the SPP IM. The entire SPP region transitioned to the new IM.

Perhaps one of the most noteworthy headlines was WFEC's successful planning, adaptation and agility to address this market with related operational and pricing changes. Previously, the SPP operated the Energy Imbalance Service (EIS) market, where WFEC served as a Balancing Authority (BA) with the responsibilities associated with dispatching its generation resources to meet, or balance to, its specific load requirements.

Components of new IM

New components of the IM included a day-ahead market, operating reserve markets, reliability unit commitments, transmission congestion rights and other key features. The new market consolidated the 16 BAs responsible for balancing load and resources in their respective areas to one centralized SPP operated BA, with the expectation of a more efficient cost-effective operation.

As the Consolidated Balancing Authority, SPP chooses which generators to run each day to balance load and generation. These daily activities oftentimes resulted in WFEC generation being chosen to operate to help supply the energy needs of the SPP footprint.

With heavy transmission congestion in northwest Oklahoma, the Mooreland Plant has been chosen to operate at levels not seen in many years. The Mooreland units were utilized not only to sell energy to the market, but their output also enabled SPP to re-direct power flows to help keep the system reliable and operating within its limits.

WFEC underwent a learning curve for much of 2015, as SPP experienced the first full year of the utilization of its IM. This market expansion was the most complex incremental step in SPP's evolutionary approach to adding market functionality. In addition to the IM, the associated Real Time Balancing Market and the annual Long-Term Congestion Rights auctions were also implemented.

The energy markets also rapidly matured during 2015. On Oct. 1, an Integrated System was added into the SPP to include parts of South Dakota, North Dakota, Montana and Minnesota. This step increased the load and generating capacity in the region, as well as led to moderate prices.

While the SPP changes were somewhat beneficial, they also challenged all utilities to create flexible strategies with their generating resources. Units that were once base-loaded coal generators on most days were put at a minimum load, displaced by less expensive natural gas and renewable energy.

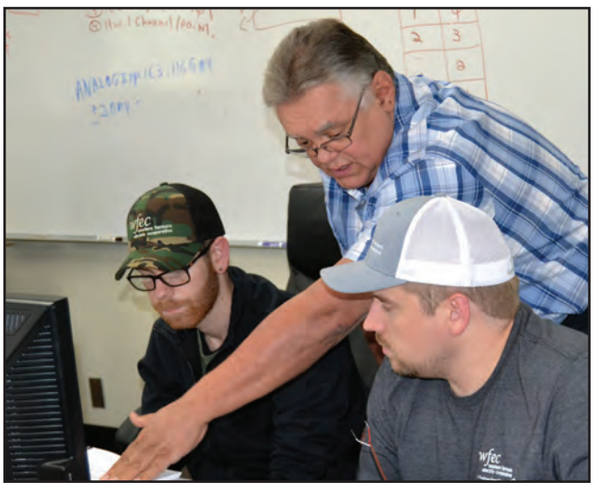
Renewable Issues

The SPP IM continued to deliver challenges for market participants as it matured. With the additions of more wind and solar, the SPP market adapted to the challenges of balancing thermal generation and renewable generation.

One consequence of the abundance of renewable generation is the strain it placed on SPP's transmission system. This congestion changed the way generation was dispatched in an attempt to balance load and keep the transmission system within its rated limits.

As system topology changes and generation resources are called upon to supply consumers' energy needs, flexibility and adaptability to changing market conditions will continue to be key to successful participation in the energy market.

Ovation training provides computer, hands-on experience for plant staff



Randy Laudrille (standing), a technical trainer for Emerson, goes over some of the steps to use with the plant control system, with Ryan Price (left) and Justin Howard, both control room operators at the Anadarko Plant. Laudrille was the instructor for both week-long sessions at WFEC.

Anadarko Plant employees recently went through a week-long training session utilizing Ovation Developer Studio software to aid in building and maintaining control systems in Anadarko's power plants. Data acquisition and control training follows the recent Ovation plant control systems upgrade to several units at the Anadarko site.

Plant personnel, including electric & instrument (E&I) technicians, control room operators and supervisors, were divided into two groups for one of the week-long sessions.

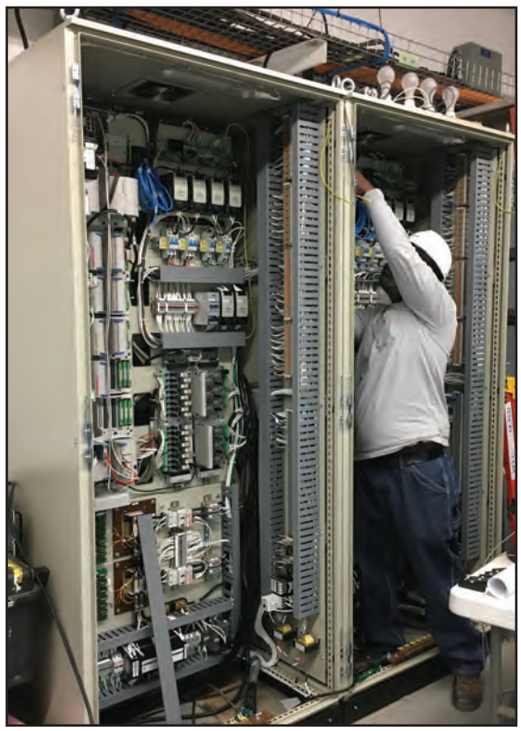
Simulator control panels were utilized for practicing various tasks and for identifying major components of the Ovation system. While the simulators are table top models, the actual equipment is much larger. (See photos at far right, next page).

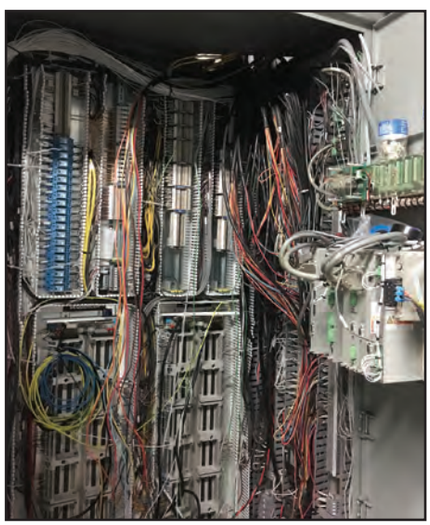
Wayne Owen (left), a shift supervisor, and Dave Broberg, an electric & instrument technician, work on designing effective control schemes for power plant operation. This intensive training will allow for utilization of the new Ovation software.

Richard Hamilton (right) connects wires within the simulator controller unit, as Don Beaty looks on during a portion of the hands-on training. Both are control room operators at the Anadarko Plant. This training follows the recent control and software upgrades on Anadarko Plant units.

Training photos by Sondra Boykin

David Gomez (left), a shift supervisor, and Larry Holmes, an electric & instrument technician in Anadarko, perform a process on the simulator controller. This tabletop model is small in comparison to the actual controllers (photos at right), but provides useful practice for participants in a classroom setting.





Recent upgrades at the Anadarko Plant consisted of converting several combined cycle units to the latest version of Ovation (far right photos). The on-site training, which followed the Anadarko Plant upgrades, enabled 16 operators and technicians to learn more about the hardware, software and tools associated with the new Ovation control system.

Ovation control upgrade photos (above) by Justin Soderberg

Gerald Riley and Kevin Beckman, both electric & instrument technicians, work together to review functions of the Ovation Developer Studio software. Computer work was a large portion of the training.

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Cooperative Home Energy Efficiency Program provides benefits, upgrades for co-op members

Story & Photos by Howie Jackson

There has never been a better time than now to upgrade the efficiency of your home. WFEC member cooperatives have partnered with Precise Building Performance and Titan ES to offer homeowners the opportunity to receive rebates when performing approved energy upgrades. These upgrades may include air sealing of penetrations to the outside, additional attic insulation, duct sealing and LED lighting.

The process starts with scheduling an energy audit of the member's home. Precise Building Performance will visit the member's home and perform an energy audit that will include a blower door test to determine how well the home is sealed against the outside air. The licensed auditor can then find where the home is leaking the most air.

A Titan ES employee seals the return air duct in a member's home.

A duct blaster test will find out how well the HVAC system's ducting is sealed to keep the temperature of the controlled air it produces going where it is supposed to and to make sure the return air is receiving its supply of air where it should - the interior of the home. An inspection of the amount of insulation in the attic will also be performed.

WFEC and the member cooperative pay up to $1,000 of the verified, measurable upgrades. The deemed savings calculator in addition to the member's rates are used to verify the payback and the kilowatt-hour (kWh) savings. Titan ES will then perform the verified, needed upgrades on the home. Titan ES has been performing these types of upgrades for over 20 years and has worked with several utilities and Tribal authorities as

A certified Titan ES employee seals the duct work in a member's home to prevent outside air from coming in the home.

LED lightbulbs are installed in the member's home or left with them if they have already changed to LED.

a weatherization contractor. Once the upgrades are performed, they will test to verify the improvement.

Every homeowner is given six LED light bulbs that are installed if needed, or left with the member if they already have LEDs installed.

Blowing in additional attic insulation will help with the heating and cooling of the home.

Russell Philpott of Precise Building Performance checks for air leaks under the bathroom sink while performing an energy audit at a member's home.

However, not every home will qualify for upgrades. In addition to the recommendations to be professionally performed, if a home qualifies, the homeowner is left with a list of items they can complete themselves. On occasions, the price of the upgrades outweighs the payback time and a homeowner may elect to not have the upgrades done.

One of the greatest benefits seen from the home energy audits, other than direct kilowatt (kW) demand reduction, has been member engagement at a one-on-one level. This new program is likely to become a fixture for the marketing area to help member cooperatives not only reduce demand, but really uphold the cooperative principles and assist members with energy education.

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Here's what some cooperative members have said in our post-audit survey:

Did the audit answer your questions about your home's energy consumption and efficiency?

"It was thoroughly done - the guy knew what he was talking about."

"Yes, I appreciated it very much. I have wanted it done for several years, but I didn't know how to do it."

Was the information provided easily understood?

"Yes, very much. Russell sat on the couch and explained everything. Even pulled up OEC's usage information and explained more than I thought he would."

"Yes, he explained it well and shared some things I would have never thought of."

Vegetation management program targets growth around poles, lines

While we all enjoy trees surrounding our homes - adding colorful landscaping, privacy and shade - there may be utility issues if foliage is not properly located. Trees and power lines do not mix and could lead to substantial pole and line damage, lengthy outages and even life-threatening injuries.

Western Farmers Electric Cooperative's (WFEC) right of way (ROW) easements establish the cooperative's right to remove trees and other obstructions from the right of way, as well as granting rights to access, inspect, repair and maintain its transmission lines. WFEC's easements also restrict the landowner from placing buildings, trees and other such items on the right of way that will inhibit the utility's ability to maintain the safety and reliability of the transmission line.

Maintaining adequate distances between transmission lines and trees, or other growth and structures, is critical to public safety and a reliable electricity supply. With this in mind, WFEC follows a vegetation management program to control the growth of trees and vegetation in and around its transmission facilities and right of way easements throughout its service territory.

Trees falling into power lines due to high winds, thunderstorms, ice storms or tornadic activity can knock power out to hundreds of members within only a few seconds. Not only do lines come down, but utility poles snap due to the weight of fallen limbs or trees, causing lengthy power outages. With an ice storm, the weight of the ice on tree limbs and nearby power lines can wreak havoc on an electric system.

Story by Sondra Boykin

While not all storm-related outages can be prevented, they can certainly be minimized if the right of way is kept clear.

Homeowner Concerns

Recently, WFEC was targeted by Norman and Moore area residents through phone calls, an area newspaper, and through the social media posts of residents of the neighborhoods affected by tree trimming and removal projects.

Currently, this particular issue is being discussed among internal staff, WFEC's tree trimming contract crew and a designated field representative overseeing the project. Also, Oklahoma Electric Cooperative has been included in numerous discussions, as the affected areas are within their respective service territory.

One specific development involves additional communication among all of the parties involved, as well as those homeowners affected.

Maintaining clear easements and rights of way are crucial for reliability and safety. The above photo shows an area after it was cleared around a transmission line located near a WFEC substation. (WFEC file photo)

Property Rights

A homeowner's right to own land doesn't prevent others from having a type of right over this land as well. Easements and rights of way are property rights that can grant others access to a property. Easements describe general property rights by others, while a right of way describes a specific property right.

An easement commonly involves utility companies, where they have the right to place utility poles and lines across a property. Plus, they can also enter the property for maintenance of the transmission facilities or other projects, such as tree removal and trimming, if necessary.

It is understandable that someone may buy a property and not be familiar with their rights and the other party's rights regarding ROW easement areas.

Trees and power lines do not mix, and when ice is added to this already dangerous blend, results can be catastrophic at times. Miles of transmission structures and line may be left mangled among the trees or crash to the ground, leading to the possibility of lengthy outages. (WFEC file photo)

Overall Concerns

WFEC's primary concerns for keeping power lines clear and enforcing the ROW standards involves public safety and reliable system operation. If trees make contact with power lines, it can cause service interruptions or worse, and WFEC is ultimately responsible.

"We want what is best for our member-owners in terms of reliability, liability and safety," noted Ricky Allen, transmission services superintendent at WFEC.

While there may be some exceptions, it is fair to say that WFEC's standard approach for maintaining right of way is to clear cut, which is consistent with industry standards.

WFEC owns and operates more than 3,700 miles of high voltage transmission line to carry electricity to its member-owners. These power lines are situated on approximately 36,000 acres of right of way.

It takes time to inspect all of the areas throughout WFEC's service territory, and it is already a year-round project for crews. Allen pointed out that it is certainly more economical, safer and more reliable to clear cut trees, otherwise vegetation management efforts will remain an ongoing and never-ending project.

Pruning trees is only a temporary solution as they will grow back. This means cutting trees down, as close to the ground as possible, is required for the right of way to be permanently cleared. Though other techniques may be used under certain circumstances, such as unique topographic and/or environmentally sensitive conditions, the most effective method involves the removal of all trees and other woody-stemmed vegetation within transmission line rights of way.

Side cutting any growth that is overhanging the easement may also be a possibility in some cases, depending on the location.

WFEC line crews determine what areas need attention by inspecting transmission lines and designating "danger trees," based on the ratings given by the crews. Allen noted that the need for ROW maintenance in the Norman and Moore areas has been evident for some time.

"We have to keep the public and our employees safe," Allen said, stressing the importance of removing "danger trees."

WFEC members desire and deserve a safe, reliable electric system, of which the transmission lines are a critical part. Keeping safety and service reliability in mind for our members and employees will always be an important goal.

Crews upgrade substations for solar power

Ethan Harrison, station apprentice II, carefully places a metering transformer on a meter stand in the Cyril Substation during a project earlier this year to prepare for solar.

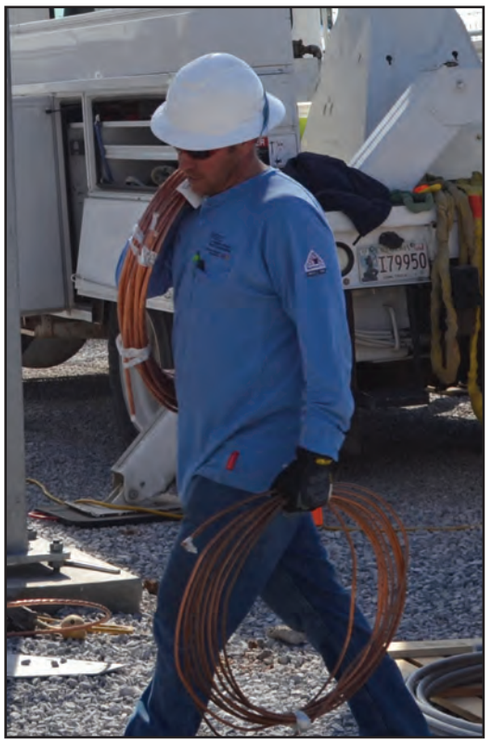
Photos by Sondra Boykin

Ethan Harrison (left); Benny Smith (middle), lead station technician; and Jeyden Miller, station apprentice II, perform upgrades to the Cyril Substation in preparation of the nearby Cyril Solar Farm completion. Upgrades and construction were both a part of the early-year projects

Danny Lindamood, station apprentice III, guides a pallet of metering transformers, to prepare for installation of this equipment on a newly constructed meter stand.

Jeramy Tackett, a journeyman station technician, lowers a beam into place during the construction of a meter stand at the Cyril Substation. New equipment was required to measure output provided by an adjacent solar farm and direct it to a low side bus of the substation.

Benny Smith, lead station technician, lowers a metering transformer into place at the Cyril Substation during an upgrade project earlier this year. The output from this equipment will be injected to the distribution system at the low side bus.



Ty Carlson, journeyman station technician, carries supplies needed for an upgrade to the Cyril Substation, located adjacent to the Cyril Solar Farm. In preparation for solar, a construction interconnection point was necessary at each of the existing substations, located near solar facilities.

WFEC and Oklahoma Electric Cooperative (OEC) crews assist with lowering a recloser into place at the OEC Solar Garden, located along I-35 in Norman. OEC is taking part in WFEC's Community Solar Projects, with a 250 kilowatt site. (Photo by Howie Jackson)

WFEC team raises near $7,800 during Relay for Life campaign

Story by Maria Crowder

WFEC Relay for Life team members, including (from left) Dan Hammons, Maria Crowder, Brittany Hicks, Rhonda Horn, Cindi Nichols, Becky Lynch and Howie Jackson, display a check replica of WFEC's donation to the Caddo County Relay For Life. Not pictured are Mechele Perry, Sondra Boykin, Sydney Eastwood, Joyce Black and Lanorma Darnell.

For the past three years, Western Farmers Electric Cooperative (WFEC) employees have shown their strong support for the American Cancer Society through fundraising events hosted primarily among the Anadarko-based employees. WFEC's Relay for Life team members, employees and family members also joined the community during Caddo County's Relay for Life event, hosted June 9 in downtown Anadarko, with WFEC being named as a "Bronze Sponsor".

WFEC's fundraising total for the 2016-17 campaign was almost $7,800, again, earning WFEC's "Power the Cure" crew the honor of "Top Fundraising Team" at the Caddo County Relay For Life event. During last year's campaign, WFEC employees raised close to $8,000 through several fundraising activities throughout the year.

Overall, the Relay For Life of Caddo County raised over $21,000, with WFEC employees raising more than one-third of this for the American Cancer Society.

Team members for this year included Becky Lynch, PC support technician; Joyce Black, insurance specialist; Maria Crowder, information specialist; Dan Hammons, systems analyst; Howie Jackson, information specialist; Brittany Hicks, marketing coordinator; Sondra Boykin, communications coordinator; Mechele Perry, human resources & payroll system specialist; Rhonda Horn, secretary, Technical Services; Cindi Nichols, secretary, Transmission Distribution staff and Sidney Eastwood, contracts specialist.

WFEC fundraisers and the total amount raised at each event for the 2016-2017 campaign included:

- Indian Taco Luncheon - $778
- Halloween Party/Costume Contest – $1,701
- Brown Bag Donations - $44
- Caddo County T-Shirt Sales - $274
- Chili Cookoff - $2,270
- NCAA Basketball Bracket - $185
- Traegar Grill Raffle - $2,030
- Donations - $500

WFEC team member Lanorma Darnell, Anadarko Plant secretary, served as accounting chairman at the Caddo County committee level of Relay for Life.

During a Relay For Life event, team members and participants take turns walking laps to raise money and awareness to help the American Cancer Society in the world's largest movement to end cancer. A special ceremony was also hosted during the event to honor those loved ones lost to cancer.

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Motorcycles/ATV	4.25%	up to 60 months
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	6.25%	up to 36 months
	6.75%	up to 48 months
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Offer good through August 31, 2017

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