



Electric Utility Report February 22, 2021

This report is being presented to both document the events that occurred between February 6th and February 19th and to catalog how electricity is generated and distributed within the City of Osawatomie.

This report is broken into several parts including:

- Context – How cold was it?
- How does Osawatomie purchase power?
- How does Osawatomie transmit power?
- What about the generators?
- Thoughts going forward

Context – How cold was it?

Starting on February 6th, the Kansas City metropolitan area had 13 straight days in which the temperature never reached 32 degrees (freezing). There was a four-day period (February 12th – 15th) in which the temperature did not exceed single digits and one day (February 15th) in which the temperature did not exceed zero degree. This was not just unseasonably cold, these were historic low temperature records, some of which go back over a century. In February, we set the record for most days (six) that stayed below 10 degrees in a month which had been set in 1899. To say it was colder than usual is an understatement. **THESE WERE RECORD COLD TEMPERATURES. IT'S THESE EXTREME CONDITIONS MORE THAN ANY OTHER FACTOR THAT CREATED THE OUTAGES THAT WE EXPERIENCED IN OSAWATOMIE AND FELT THROUGHOUT THE KANSAS CITY METROPOLITAN AREA.**

How does Osawatomie Purchase Power?

The way the City generates and purchases power has changed over time. In the early to mid-20th century the City generated its own power. We were small enough and limited in our use of electricity that us generating power made sense. With the advent of air conditioning and the tightening in environmental laws, generating electricity became more difficult for small communities and in 1980 the Kansas Municipal Energy Agency (KMEA) was created.

KMEA was officially formed under Kansas law as a quasi-municipal corporation established as a nonprofit joint action agency made up of electric municipalities. KMEA has similar rules as a city — such as open meetings and open records.

KMEA was authorized by Act, to plan, finance and construct projects for the purchase, sale, generation and transmission of electricity for the purpose of securing an adequate, economical and reliable supply of electricity and other energy for its members. KMEA was also authorized to issue and sell revenue bonds for the purpose of providing funds to pay all or part of the cost of the acquisition, purchase and construction of such projects.

In 1982, KMEA completed its first power supply project named the Nearman Project by purchasing 37.5 MW from the Kansas City, Kansas Board of Public Utilities Nearman Unit Number 1. Since 1983, KMEA has succeeded in bringing hydropower into the state from the Southwest Power Administration and the Western Area Power Administration, along with numerous other power supply. In 1998, KMEA was successful in having the original Act amended, which eliminated the need for its members to have a generating municipal electric utility. This change in legislation opened the doors for “distribution only” municipal electric systems to become KMEA members.

Today, over 80 Kansas Municipalities benefit from being members of KMEA. By joining KMEA, these cities come together to strengthen their effectiveness in dealing with common challenges. Through the joint action approach, the cities employ KMEA to undertake projects that they would find impractical if attempted separately.

As members of KMEA we participate in a particular project group. We are members of Energy Management Project No. 1 (EMP1)

EMP1 was officially created in January 2006, by a set of agreements between KMEA and five member cities: Baldwin City, Gardner, Garnett, Osawatomie and Ottawa. In 2016 the City of Pomona joined the group and in 2017 the City of Prescott became a member.

Under the EMP1 agreement, project cities operationally combine their municipal electric systems to purchase electric power and transmission as a centrally dispatched group. KMEA manages the power supplied from EMP1’s resources, which include Buckeye Wind, Dogwood, GRDA, Marshall Wind, SPA and WAPA. KMEA began delivering electricity under the EMP1 on June 1, 2006.

How does Osawatomie transmit power?

Generation is just half of the equation – transmission and the ability to receive the power is the other half. So, if you weren’t familiar you likely are now with the **Southwest Power Pool (SPP)**. You’ve heard a whole lot about them the last week. **So who is SPP?**

Southwest Power Pool (SPP) is a Regional Transmission Organization (RTO). As a member of the SPP, KMEA must purchase transmission for its member's power contracts. KMEA's primary challenge is to acquire long term transmission rights for its members.

Getting a transmission path from a generation resource (Source) to the Load (User or Sink) is a challenging proposition. The SPP Tariff has many processes and KMEA supplies expertise in these different areas that allow its members to acquire transmission service at the lowest cost. KMEA is well versed in using special SPP Business Practices to allow for procurement of transmission quickly. The Tariff also has provisions for requesting waivers of costs when those costs are discriminatory or unjustly being applied to the end user. KMEA has saved its member Cites well over \$10,000,000 in transmission upgrade costs in the last 10 years by requesting waivers.

KMEA has staff that is a voting member on the SPP Regional Tariff Working Group (RTWG). This staff member is kept aware of all changes that are being made to the SPP Tariff. As an active voting member, KMEA has the ability to review and take action on tariff changes that might adversely impact municipalities. The SPP Tariff changes continually and KMEA staff stays up to date on those changes as they are being implemented.

A little more about SPP

SPP was founded in 1941 when eleven regional power companies pooled their resources to keep Arkansas' Jones Mill powered around the clock in support of critical, national defense needs.

Today, SPP oversees the bulk electric grid and wholesale power market in the central United States on behalf of a diverse group of utilities and transmission companies in 17 states.

As an RTO, they ensure the reliable supply of power, adequate transmission infrastructure, and competitive wholesale electricity prices for a 552,000-square-mile region, including more than 60,000 miles of high-voltage transmission lines in the Eastern Interconnection.

SPP is one of nine independent system operators (ISO) and RTOs in North America. SPP is mandated by FERC to ensure reliable supplies of power, adequate transmission infrastructure and competitive wholesale prices of electricity.

ISOs/RTOs are 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.

SPP has members in 14 states: Arkansas, Iowa, Kansas, Louisiana, Minnesota, Missouri, Montana, Nebraska, New Mexico, North Dakota, Oklahoma, South Dakota, Texas and Wyoming. SPP also provides contract reliability coordination services in Arizona, Colorado and Utah.

SO HOW BIG IS SPP?

- **Service territory:** 546,000 square miles (approx.) (2020)
- **Substations:** 5,054 (2020)
- **Generation plants:** 818 (in 2020 reliability coordination footprint)
- **Miles of transmission:** 68,272 (2020)
- **Coincident peak load:** 50,662 MW (Aug. 19, 2019)
- **Winter peak load:** 43,584 MW (Jan. 17, 2018)

WHAT DOES ALL THIS MEAN?

In order for the City of Osawatomie to get the best rates and the best transmission costs we work in a varying arrangement of power purchasing pools and distributions systems. That's how we get the "biggest bang" for your utility "bucks." It also means we have to work in cooperation with EMP1, KMEA and SPP as we generate and deliver power. What follows is all the communication and coordination that you didn't necessarily see in the media. **This is the coordination that occurred behind the scenes which led to some rolling blackouts but avoided the complete loss of electricity like what you're now seeing in the State of Texas.**

SPP'S TIMELINE OF FEBRUARY 2021 WINTER WEATHER EVENTS

- Feb. 9 at 00:00 a.m. (Midnight) In response to the current cold-weather event, SPP first declared a period of conservative operations effective until further notice.
- Feb. 15 at 00:00 a.m. (Midnight) SPP requested that load-serving utilities throughout the SPP region conserve energy beginning at midnight on Feb. 15 and for the following 48 hours to mitigate the risk of more widespread and longer-lasting outages.
- Feb. 15, at 05:00 a.m. SPP declared an Energy Emergency Alert (EEA) Level 1, meaning that all available resources had been committed to meet obligations, and SPP was at risk of not meeting required operating reserves.
- Feb. 15 at 7:22 a.m. SPP declared an EEA Level 2 which required SPP to ask its member companies to issue public conservation appeals, and served as a maximum emergency generation notification for resources, and informed the market that emergency ranges of any resources may be required.
- Feb. 15 at 10:08 a.m. SPP declared an EEA Level 3 when it was forced to begin relying on required reserve energy. This meant it was carrying reserves below the required minimum and had initiated assistance through the Reserve Sharing Group.

- Feb. 15 at approximately 12:10 pm. While still under EEA Level 3 and after exhausting reserves, SPP directed member utilities to implement controlled, temporary interruptions of service.
- Feb. 15 at 2:00 p.m. SPP declared a return to EEA Level 2, restoring load to the region with enough generation to meet demand and minimum reserve requirements.
- Feb. 16 at 6:15 a.m. SPP declared an EEA Level 3. System-wide generating capacity had dropped below current load of approximately 42 gigawatts (GW) due to extremely low temperatures, inadequate supplies of natural gas and wind generation. SPP directed member utilities to implement controlled, temporary interruptions of service.
- Feb. 16 at 10:07 a.m. SPP had restored all load, meaning it had enough generating capacity available to meet system-wide demand. It remained in an EEA Level 3, indicating it was still operating below required minimum reserves.
- Feb. 16 at 11:30 a.m. SPP returned to EEA Level 2 until further notice, restoring load to the region with enough generation to meet demand and minimum reserve requirements.
- Feb. 16 at 12:31 p.m. SPP downgraded to an EEA Level 1. While no longer an Energy Deficient Entity, all available resources were committed to meet obligations, and SPP remained at risk of not meeting required operating reserves.
- Feb. 16 at 6:28 p.m. SPP declared an escalation to EEA Level 2. SPP directed its member companies to issue public conservation appeals. The alert will remain in effect until further notice. At the time, SPP had enough generating capacity online to meet system-wide demand, but was taking steps to mitigate the risk of outages.
- Feb. 17 at 1:15 p.m. SPP downgraded to an EEA Level 1. While no longer an Energy Deficient Entity, all available resources were committed to meet obligations, and SPP remained at risk of not meeting required operating reserves.
- Feb. 17 at 6:20 p.m. SPP declared an escalation to EEA Level 2. SPP directed its member companies to issue public conservation appeals. The alert will remain in effect until further notice.
- Feb. 17 at 10:59 p.m. SPP downgraded to an EEA Level 1. While no longer an Energy Deficient Entity, all available resources were committed to meet obligations, and SPP remained at risk of not meeting required operating reserves.
- Feb. 18 at 9:30 a.m. SPP downgraded from EEA Level 1 to a conservative operations status. Due to continuing high loads and other severe cold weather implications, it will remain in a period of conservative operations until 10 p.m., Feb. 20, for the entire SPP balancing authority area.
- Feb. 18 at 6:25 p.m. SPP declared an EEA Level 1, meaning that all available resources had been committed to meet obligations, and SPP was at risk of not meeting required operating reserves.
- Feb. 19 at 9:20 a.m. SPP downgraded from EEA Level 1 to a conservative operations status. Due to continuing high loads and other severe cold weather implications, it will remain in a period of conservative operations until 10 p.m., Feb. 20, for the entire SPP balancing authority area.

- Feb. 20 at 10:00 p.m. SPP returned to normal operations for the entire SPP balancing authority area, signaling it has enough generation to meet demand and available reserves and foresees no extreme or abnormal threats to reliability.

What about the Generators?

I have received many questions over the last week about our power generation capabilities (ie the six diesel Generators that were installed a couple of years ago). The questions have revolved around these three common themes:

1. **What about the Generators?**
2. **Why didn't they work?**
3. **What does this mean to my electric bill?**

What about the Generators?

We purchased six (6) 2 MW Diesel generators in 2016. These generators were purchased with two goals in mind.

1. To create a pool of generating capacity that could be sold at certain times (when the market and costs are favorable to the City) to KMEA and its members which then gets reflected in a credit to the power purchases we make through KMEA.
2. To create a viable potential emergency electric source.

Why didn't they work?

Some of the generators did work when they were called and some of them didn't. At one point we had half of our generating capacity up and running. At peak generation we were producing 6 MW of power – which was the request made by KMEA/SPP. During the period outlined in this report we produced a total of 145.2 Megawatt hours (MWh) from our generators.

Now, for the ones that weren't working, about 90% of the problem was the cold weather itself causing pieces of our generation capacity to break when brought online. Another 10% relates to programming and maintenance issues that came up when they were started.

What does this mean to my electric bill?

At this point we are unsure of the impacts on electric bills. KMEA along with SPP is working on the extreme price fluctuations that occurred in the marketplace and could be passed onto energy providers. This issue is still evolving and when we have better information, we will provide it to all of our customers.

Thoughts going forward

The US electric grid is much more fragile than many realized, especially when placed under extreme weather conditions. The question now becomes “what is the cost to protect against this in the future?” Here’s what we’ve learned.

- The City of Osawatomie’s distribution system (grid) has been well maintained and upgraded over the last decade. Any power losses were from outside of our grid and **not** created or caused by us.
- Power generation for a small community probably needs to be focused on renewables that have fewer failure points. *When the sun comes out, you generate power. When the wind blows, you generate power.* Properly built solar arrays and wind turbines are temperature independent.
- The real failures in power generation weren’t in the renewables. The SPP has about 25% in renewables which is 2-2.5 times as much as the State of Texas. SPP has a larger area to cover (546,000 sq miles) or twice the size of Texas and a population (19 million) that’s about 2/3rds of Texas.
- So why didn’t the SPP customers (states and localities) face the same failure rates as Texas? Distributed generation is probably the answer, **plus** the use of renewables.