



A peek inside the Southwest Power Pool control room shows system operators working to make sure power supply always matches demand across 14 states on the grid. Photo provided by SPP.

# AN ENERGY EMERGENCY

## Why Did February Outages Happen and Could They Happen Again?

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The national power grid has been hailed as one of the greatest and most complex engineering feats ever achieved. Every second of every day it works to keep electricity flowing freely to homes, schools, farms, hospitals and businesses in every region of the country.

But while it stands as one of mankind's most marvelous inventions, sometimes it's simply no match for Mother Nature.

This electric superhighway was put to the test in mid-February when a bone-chilling air mass swept through large swaths of the country and caused a spike in the demand for power. As the temperatures dropped, millions of Americans attempted to stave off the frigid air by reaching for electric blankets, plugging in space heaters and nudging their thermostats up a few notches. With so many people clamoring to stay warm, the sudden spike in demand for power caused the gatekeepers of the grid to reach their option of last resort: ordering temporary disruptions in service to maintain the delicate balance between demand and supply that's required to keep the network from completely melting down.

The result was several waves of controlled and coordinated rolling blackouts often spanning one hour and isolated incidents of up to three hours for some consumers. The service interruptions impacted nearly one-third of the nation. Industry officials explain that this response to skyrocketing demand was necessary to keep the grid from sustaining extensive damage and causing a repeat of the historic event that occurred in the summer of 2003. The Northeast Blackout extended across the eastern seaboard, through parts of the Midwest and into southern Canada and left approximately 50 million in the dark.

"Controlled outages are necessary to prevent widespread damage to the grid, which could cause a cascade of outages that could potentially be far more devastating," explained Barbara Sugg, CEO of the Southwest Power Pool (SPP). "There's no doubt this would have been a much more significant event if our individual customers and businesses and industries had not all pulled together to reduce the load."

### Air Traffic Controllers for the Grid

Sugg describes her organization as an "air traffic controller" for the grid. In fact, the SPP is what's known in the electric utility industry as a Regional Transmission Organization (RTO). It's one of the four quasi-government entities responsible for maintaining the critical balance between supply and demand along the nation's power grid. While RTOs don't create or generate power, they are charged under the Federal Energy Regulatory Commission (FERC) with the task of making sure the power produced by other utilities flows smoothly across the grid and gets to the places where consumers need it, when they need it.

SPP is the power transmission overseer for 14 states - including South Dakota - and more than 17 million people in the midsection of the U.S. from North Dakota to the Texas Panhandle. Electric co-ops in South Dakota are also part of the Western Area Power Administration (WAPA), a federal agency that markets power produced from hydroelectric dams in the Upper Midwest. It operates the larger bulk transmission facilities in 15 central and western states in its geographical footprint.

Most of the time the high-voltage transmission process operates without a hitch, and electric generation can be moved across the grid when there is high demand in one area and excess generation in another. But when foul weather comes into the picture grid operators focus on activating their emergency response plans. Those plans typically include communicating with generators to coordinate arrangements for assuring that an ample supply of power will be available to meet projected demand when the inclement weather strikes.

Lanny Nickell, operations manager for SPP, points out that while arrangements were in place to face the February cold snap, the winter blast turned out to be an unprecedented event for the organization. As the temperatures dropped, SPP initiated the process of contacting power generators and transmitters to warn that the looming storm may cause the system to be severely strained. Six days later, SPP officials went

through a series of three Energy Emergency Alert levels and eventually declared a Level 3 emergency, which required “controlled interruptions of service,” or rolling blackouts. It was the first time in the SPP’s 80 years that a Level 3 emergency was declared.

“Despite our plans, the severe weather coupled with a limited fuel supply hampered our ability to balance our supply with the demand from end-use consumers,” Nickell said. “So, first we had to go out and ask for a voluntary reduction in energy use. Then, we held off as long as we could to make the call to interrupt service in a controlled fashion, but it was necessary to prevent overloading the system and causing an even bigger problem and much longer outages.”

Nickell explained that without an affordable and viable means of storing high-voltage electricity for future use, power is created in one location and consumed in another location in real time. The balance must be maintained even though both supply and consumption change on a second-by-second basis.

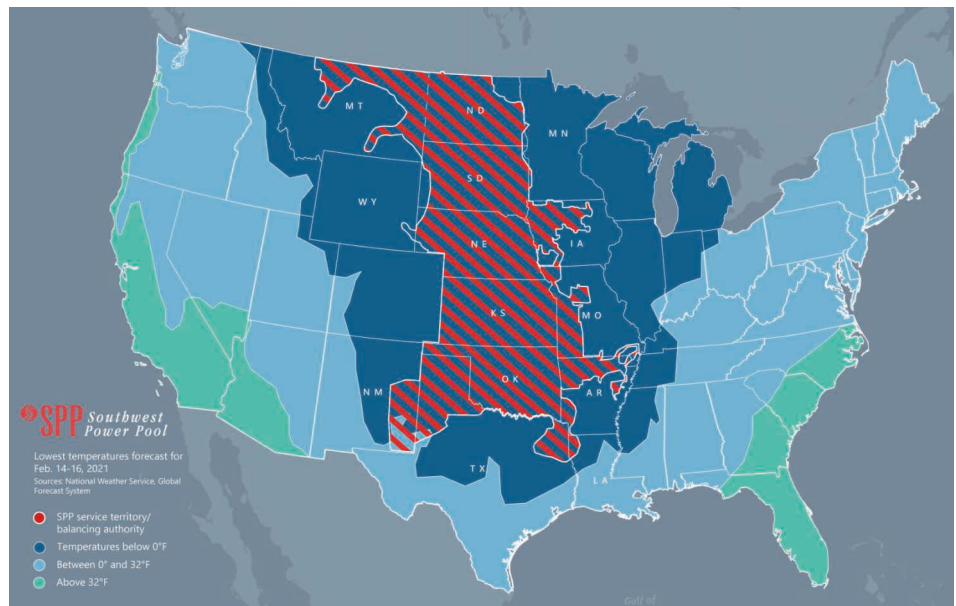
“Once we observe an imbalance, we have to react within seconds to reduce the demand,” Nickell said. “This is why it’s very difficult for us to announce well beforehand when these things will happen because they happen at the speed of light.”

### A Smorgasbord of Fuel Sources

Interruptions in service are more than minor inconveniences for many co-op members, especially when severe weather conditions are in play. The February storm and the ensuing service outages triggered wide-ranging discussions about the push toward renewable resources to generate electricity.

Supporters of fossil fuels point out that decades-long efforts to curb coal and natural gas played a part in restricting the kinds of available resources that could have prevented widespread outages. Coal has long been a reliable source of “baseload power” requirements, or the amount of power necessary to provide an adequate supply to meet basic needs without interruption. It’s utilized largely because it can be more easily controlled compared to intermittent sources. Advocates emphasize that wind turbines were frozen in place and solar panels were buried in snow and limited by scarce sunlight during this event.

Renewable fuel source proponents echoed SPP officials in noting that the February storm was an historic occurrence. They contend that renewable power promotes a cleaner environment, decreases energy reliance on other countries, adds jobs to the economy and that innovations in the emerging industry



could be effective in responding to any future storms. Presently, roughly 25 percent of South Dakota’s overall energy supply comes from wind turbines. For electric co-ops, that figure is closer to 20 percent. Proponents of wind also point to issues with natural gas delivery and the inability of some fossil fuel plants to produce electricity through the storm. A combination of high demand, lower-than-normal wind resources and natural gas delivery problems all met at the same time to contribute to the energy emergency.

As for those members of RTOs who receive the call to actually implement controlled outages - particularly transmission and distribution cooperatives - there are very few options available when demand begins to significantly outpace supply on the grid.

Chris Studer is chief member and public relations officer for East River Electric, a co-op that provides transmission and substation services for distribution entities in South Dakota and Minnesota. He said the cooperative’s hands are essentially tied when SPP reaches the point of calling for rolling outages.

“The utilities involved in the SPP are required to carry a surplus of generation resources throughout the year over and above their historic peak demand so they are prepared for extreme circumstances. However, when wind resources and other generation are constrained, there is a limited amount of other generation available to serve the region’s recent record demand for electricity,” he said.

Distribution co-ops find they have even less control when RTOs and power marketing agencies restrict the flow of power, but they still find ways to mitigate the situation. Officials at West River Electric based in Wall, implemented

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**- Lanny Nickell, SPP**

the co-op’s load management program after receiving the request for reduced demand hoping it would be enough. But it was not, and some of the co-op’s members were subject to a 50-minute unplanned blackout. CEO Dick Johnson said he had never experienced a similar event in his 27 years in the industry. He added that he hopes the emergency situation prompts discussions centered around policy proposals that will prevent future emergencies.

“I think we should have a national conversation that includes large new baseload generation, whether that be hydroelectric, nuclear or carbon capture on coal plants. We must also have a conversation about building necessary electric and gas transmission infrastructure to allow us to get electricity and gas to the places where it is needed when times like this happen. If not, I am afraid it will happen again in the future, only more frequently.”