

In widespread emergency, municipal plants charge into action

by Steve Downer

During an unprecedented mid-February disruption on middle America's electrical grids, Minnesota municipal power plants again proved their worth.

These smaller municipal generators can ramp up to generate within minutes. This provides essential grid balancing support, which is especially helpful as the power system incorporates ever increasing renewable sources. These generators allow power output to be quickly adjusted to respond to fluctuations in the power demand and market conditions.

The Southwest Power Pool (SPP) called for rolling power outages the morning of Feb. 16, which affected the cities of Tyler, Luverne and Moor-



Among the Moorhead Public Service staff that helped operate the local power plant during the February grid emergency were, from left to right: Matt Marks, Mike Wilmer, Aaron Van Beek and General Manager Travis Schmidt.

Municipal plants: see page 8

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MISO study: Grid risk increases with more renewable generation

Editor's note: While our readers are no doubt aware of the wider situation, it should be noted that the following report was written while a large swath of the country's mid-section, from Texas to the northern plains, suffered electrical grid outages. While identification of causes awaits another in an increasingly long line of post-outage examinations, the proximate causes seem to be unusual weather and the resulting demands placed on the electrical grid.

by Steve Downer

While policymakers call for 100 percent renewable electricity and utilities shift to provide it, the Midcontinent Independent System Operator (MISO) recently cautioned that "as renewable energy penetration increases, so does the variety and magnitude of the bulk electric system need and risks."

That statement came in February's re-

lease of an updated Renewable Integration Impact Assessment (RIIA). The assessment finds that managing the regional electrical grid beyond a 30 percent system-wide renewable level "is not insurmountable" but will require "transformational change."

The RIIA examines renewable penetration levels up to 50 percent, far short of the 100 percent currently being called for by many Minnesota policymakers.

The report steers clear of overt policy recommendations but notes the need for "transformational thinking and problem-solving."

There are mighty problems to wrestle with.

"The grid's ability to maintain stable operation is adversely impacted, primarily when renewable resources are clustered in one region of the transmission system,"

notes the report. As inverter-based (digital) resources displace conventional (physical) generators, the grid loses stability.

To maintain stability with increased renewable resources, MISO foresees a combination of multiple technologies — such as high-voltage direct current (HVDC) lines, synchronous condensers, motor-generator sets and emerging technology such as grid-forming inverters. This transition will need to be accompanied by "operational and market changes to identify and react to this risk as it occurs."

The periods of highest stress on the transmission system shift from peak power demand to times when renewables supply most of the energy and long-distance power transfers increase. As renewable resources

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Natural gas prices skyrocket during wintertime emergency

The Minnesota Public Utilities Commission (MPUC) will be among those investigating a mid-February spike in natural gas prices.

The MPUC Feb. 23 launched what promises to be a wide-ranging look into the impact of severe weather on natural gas customers and utilities, including gas supply, planning and purchases, and the state's regulatory processes. The price spike coincided with extreme record cold that enveloped the nation's midsection.

Instead of expected February customer bills of approximately \$50 the state-regulated gas utilities projected charges of up to \$300. There is a built-in deferral of cost recovery for the state-regulated natural gas distribution utilities, however, because of a Minnesota regulatory 'true-up'

of annual gas costs, which occurs in September.

Utilities at the hearing commonly mentioned recovering the additional cost over 12 months, or potentially longer. (Greater Minnesota Gas, however, reported no impact and was excused from the investigation.)

After the 2019 polar vortex exposed weakness in several gas distribution areas, the state directed utilities to physically improve portions of their systems. Provision of reliable service appeared to be the focus of the utilities during the February cold snap.

It had a commitment to serve, noted CenterPoint Energy, and a need to purchase gas.

That led the utility to absorb costs that

were necessary at the time to maintain service. The February experience may lead to a rethinking of certain longstanding practices.

Discussion indicated Minnesota would join a multi-state or federal effort to investigate the situation and potential price gouging. The Federal Energy Regulatory Commission (FERC) and North American Electric Reliability Corporation (NERC) have also announced investigations. (In 2011, FERC and NERC issued a report and recommendations stemming from Outages and Curtailment During the Southwest Cold Weather Event of February 1-5, 2011. This report included Texas.)

Minnesota Sen. Tina Smith has also

Gas Prices: see page 6 please

With ‘worrying’ levels of debt, MPUC, utilities chart post-pandemic course

Minnesota investor-owned utilities, along with many municipals and cooperatives, adopted a moratorium on disconnects and various other collection practices during the state’s COVID-19 pandemic emergency response.

Now, with unpaid customer bills reaching “worrying” levels, the Minnesota Public Utilities Commission (MPUC) is laying the groundwork for a transition to traditional utility business practices.

At the onset of the COVID-19 pandemic in late March 2020, the MPUC and Department of Commerce jointly requested voluntary, immediate utility actions to protect residential customers. Protections concentrated on maintaining heat and electricity service through a moratorium on disconnections as well as fees for reconnection or late payment.

Minnesota’s gas and electric utilities were quick to provide information to the MPUC on steps taken to protect customers during the

COVID emergency.

The MPUC established monthly reporting requirements for rate-regulated utilities and eventually ordered transition plans to keep power on and manage pandemic-related debts.

In re-introducing the topic at a Feb. 4 meeting, MPUC staff noted “worrying” debt growth, particularly for Otter Tail Power and Xcel. Xcel’s customer debt was “very high,” compared to other utilities, noted staff.

In November 2020, Xcel reported approximately 14 percent of its residential customer accounts were past due, and an average past due balance of nearly \$450. The total owed by past due Xcel residential customers was approaching \$80 million, heading into the February meeting.

Otter Tail reported approximately 15 percent of residential customers with a past due balance (down from more than 25 percent in February 2020) and an average amount

past-due of well over \$300. Minnesota Power reported more than 13 percent of its residential customers past due with an average arrearage of nearly \$300.

CenterPoint Energy, the state’s largest natural gas distribution company, reported nearly 14 percent of its residential customers were past due on their accounts with an average amount past-due of under \$200. CenterPoint reported a total past-due owed from residential customers of nearly \$20 million.

The MPUC Feb. 4 adopted a ‘Transition Plan Template.’ The template includes:

- Timing of disconnection notices
- Imposition of service deposits, reconnection fees, down payment requirements, interest charged, penalties and other fees and charges
- Payment plan terms and duration
- Arrearage forgiveness plans.
- Utilities that file a transition plan may resume collec-

tion activity and service disconnections upon finding of transition plan completeness or 90 days following the end of the peacetime emergency.

The MPUC established a comment period to respond to the proposed Transition Plan template and to develop primary criteria and terms for resuming collection activities and service disconnections.

Primary criteria and terms shall include, but are not limited to, the following:

- Notice and outreach to customers in arrears regarding assistance programs, collection activities, payment

requirements, and service disconnection; and approval of an updated reporting template to ensure that reporting includes all elements of the Cold Weather Rule.

The utilities will use a common definition of “reconnected customer” as a customer who was disconnected and reconnected to service at the same premise.

The MPUC also updated reporting requirements. In response to calls for “equity,” the reports will include the total number of residential customers disconnected, by zip code, in prospective July and

Florida water utility compromised

From APPA

The City of Oldsmar, Florida’s water treatment plant computer control system was remotely accessed Feb. 5 by an unknown suspect. This unlawful intrusion of the city’s water treatment system is under investigation by detectives assigned to the county sheriff’s digital forensics unit.

The city’s computer system allows for remote access by authorized users to troubleshoot any system problems from other locations.

“The initial intrusion at 8:00 a.m. was brief and not cause for concern due to supervisors regularly accessing the system remotely to monitor the system,” the Sheriff’s Office said.

At 1:30 p.m., a plant operator witnessed a second remote access user opening various functions in the system that control the amount of sodium

hydroxide in the water. The operator noted the remote access user raised the levels of sodium hydroxide in the water.

The operator immediately reduced the levels to their appropriate amount. The initial investigation revealed that the hacker remotely accessed the treatment plant’s control system for approximately three to five minutes.

“While this incident did not involve an electric utility, the relevance to the electricity subsector cannot be understated,” said Sam Rozenberg, Senior Director of Security and Resilience at the American Public Power Association.

It is recommended public power utilities join the Electricity Information Sharing and Analysis Center (E-ISAC) for timely and actionable sharing of threats to the electricity subsector.



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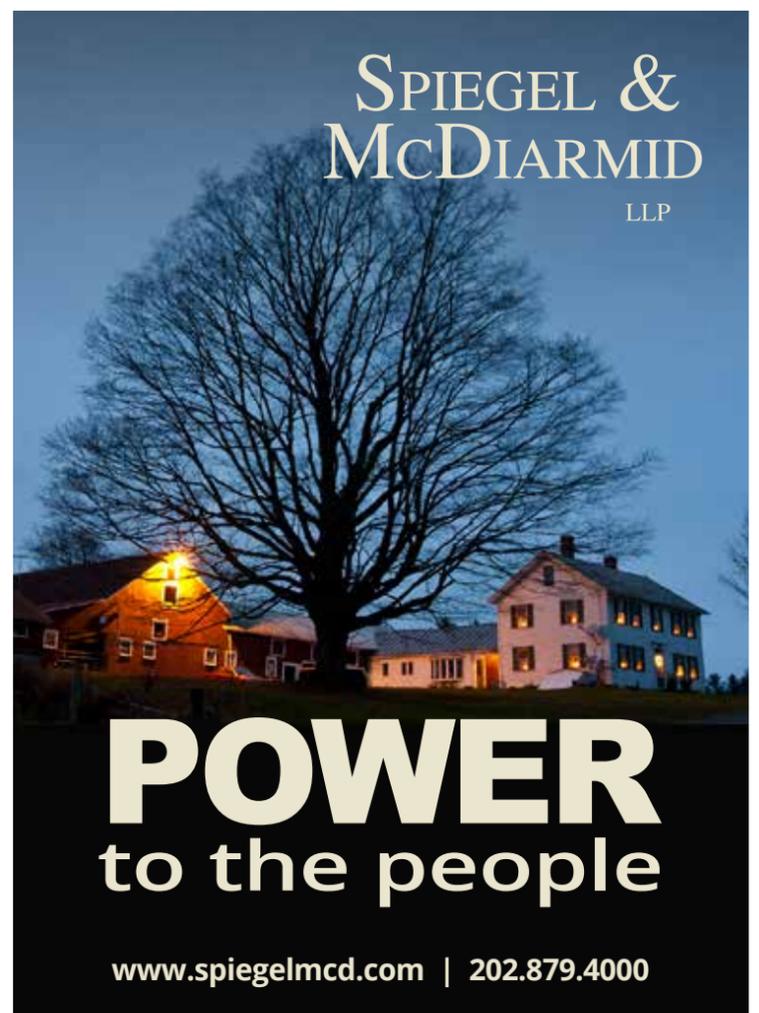
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Among flurry of executive orders, President Biden addresses climate change

by Paul Ciampoli, News Director, American Public Power Association

President Joe Biden on Jan. 27 signed an executive order aimed at addressing climate change that consists of two major parts, with the first part addressing foreign policy and national security and the second part focused on a domestic “government-wide” approach.

The executive order establishes the roles and responsibilities of both the Special Presidential Envoy for Climate, focused on international activities, and the National Climate Advisor, focused on domestic efforts.

It also creates a National Climate Task Force comprised of cabinet members and agency leaders. Those leaders will be tasked with, among other things, creating a federal clean electricity and vehicle procurement strategy that will use available procurement authorities to achieve or facilitate “a carbon pollution-free electricity sector no later than 2035” and “clean and zero-emission vehicles for Federal, State, local, and Tribal government fleets.”

The executive order also states that it is the policy of the Biden administration to “align the management of the Federal procurement and real property, public lands and waters, and financial programs to support robust climate action.”

In addition, it directs the task force to increase renewable energy production on federal lands and waters with a goal of doubling offshore wind by 2030.

The executive order also requires the Office of Management and Budget director, along with the Chair of the Council on Environmental Quality, to take steps to “ensure that federal infrastructure investment reduces climate pollution and to require federal permitting decisions consider the effects of greenhouse gas emissions and climate change.”

It also tasks them with identifying steps that can be taken to “accelerate the deployment of clean energy and transmission projects in an environmentally stable manner.”

It also creates an Interagency Working Group on Coal and Power Plant Communities and Economic Revitalization tasked with coordinating and delivering federal resources to revitalize the economies of communities

with coal, oil, and gas power plants.

In addition, the executive order creates an Environmental Justice Interagency Council representing several federal agencies to “address current and historic environmental injustice.”

In remarks made on Jan. 27, Biden said that already, 84 percent of all new electric capacity planned to come onto the electric grid this year is clean energy.

“Clean energy. Why? Because it’s affordable. Because it’s clean. Because, in many cases, it’s cheaper,” he said.

“We’re going to need scientists, the national labs, land-grant universities, historical black colleges and universities to innovate the technologies needed to generate, store, and transmit clean electric — clean electricity across distances, and battery technology, and a whole range of other things,” he said.

Major environmental rules potentially reviewed in a Biden Administration

Meanwhile, on Jan. 20, 2021, Biden signed a host of executive orders including “Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis” directing all executive offices and agencies to “immediately review and, as appropriate and consistent with applicable law, take action to address the promulgation of Federal regulations and other actions during the last 4 years that conflict with these important national objectives, and to immediately commence work to confront the climate crisis.”

The “Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis” executive order directs agency heads to submit to the Office of Management and Budget (OMB) within 30 days, a preliminary list of actions they are considering that would be completed by December 31, 2021, and within 90 days, an updated list of actions they are considering that would be completed by December 31,

2025.

There are a series of specific Trump administration regulations the executive order directs federal agencies to “consider” suspending, revising, or rescind related to methane emissions, fuel economy standards, efficiency standards, and pollution standards by specified dates.

In addition, the Biden administration released a fact sheet with at least 48 EPA regulations and other actions for review and potential reversal. Additional agency actions also will be reviewed to determine consistency with the executive order.

The executive order directs the reestablishment of the interagency working group on the social cost of carbon and other greenhouse gases and the use of “interim” estimates for climate damages, to ensure factoring the “full costs” of greenhouse gases—including environmental justice concerns and intergenerational equity—into federal actions.

The executive order also directs the Council on Environmental Quality to rescind its 2019 draft guidance, “Draft NEPA Guidance on Consideration of Greenhouse Gas Emissions,” and to review, revise, and update its previous 2016 guidance, “Final Guidance for Federal Departments and Agencies on Consideration of Greenhouse Gas Emissions and the Effect of Climate Change in NEPA Reviews.”

The executive order also revokes other Trump-era executive orders related to the environment, including, among others, executive order 13778 (Restoring the Rule of Law, Federalism, and Economic Growth by Reviewing the “Waters of the U.S.” Rule) and executive order 13783 (Promoting Energy Independence and Economic Growth).

Biden on Jan. 20 also re-committed the U.S. to the Paris Climate Agreement.

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Study:

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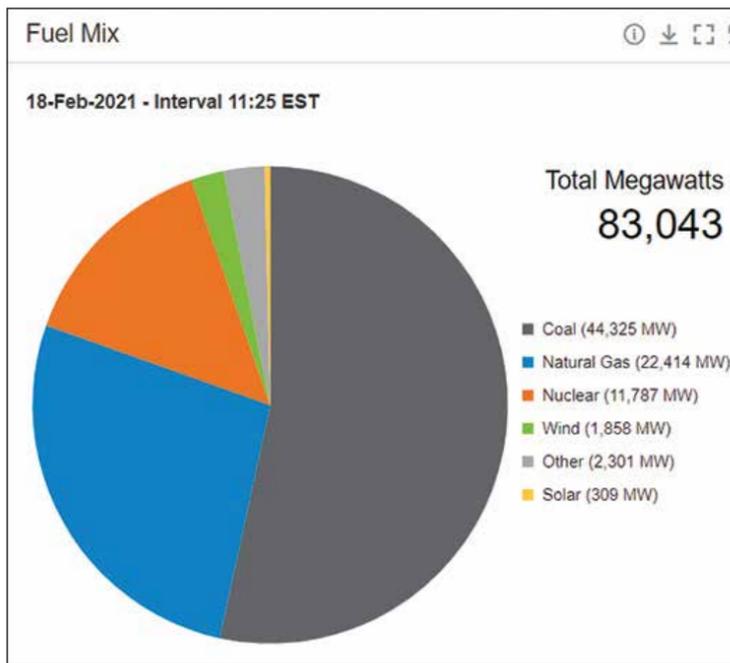
supply most of the energy, the system becomes more dependent on the stability attributes of the remaining conventional (nuclear and fossil-fueled) generators, increasing the system risk associated with unexpected outages of those generators.

The direction and magnitude of power flows change rapidly due to the output of renewable resources that vary with weather conditions, resulting in new and shifting periods of stress.

The risk of not having

enough generation to meet demand shifts from the historic times of peak power demand to other periods, specifically hot summer evenings and cold winter mornings, when low availability of wind and solar resources is coincident with high power demand. These shifts are regional in nature, noted the RIAA.

The colder and windier northern states exhibit different patterns than the hotter and sunnier southern states. To address this changing risk, the system needs to ensure (1) sufficient visibility of locational risk and (2) that other energy-supplying resources are available during



If the MISO region is going to transition to 50 percent, or 100 percent renewable energy, it has a long ways to go. Here is a MISO fuel mix graph as this piece was being written. At the time, the weather was sunny and 15 below, with winds from 5-10 mph. The evening forecast called for 16 below and calm winds. Cold and calm prevailed throughout the forecast period.

these new times of need, with adequate transmission to deliver across regions.

The ability of resources to provide system flexibility will be challenged. Current flexibility is needed primarily around the morning as energy demand increases and again during the evening as demand decreases. This risk shifts as variable renewables are added. As solar resources meet a larger share of the mid-day generation needs, non-solar resources are needed to ramp down in the morning and ramp up again in the evening. Similarly, non-wind resources will ramp up and down to balance wind patterns, which change daily.

The current transmission infrastructure, said the report, becomes unable to deliver

er energy to load. This means that the transmission system is not able to deliver available renewable energy reliably, leading to curtailments. This is especially true if renewables are concentrated in one part of the footprint while serving load in another. Given how much time is typically needed to build transmission, noted the report, proactive planning is necessary.

RIIA found when the percentage of system-wide annual load served by renewable resources is less than 30 percent, the integration of wind and solar will require transmission expansion as well as significant changes to current operating, market, and planning practices — all of which appear manageable within MISO's existing framework.

Beyond 30 percent, “transformative thinking and coordinated action between MISO and its members are required to prepare for the significant challenges that arise.”

The RIIA also pointed out that renewable growth does not happen uniformly across the MISO footprint, or the broader interconnected system. Growth occurs fastest in areas with high quality wind and solar resources, available transmission capacity, and favorable regulatory environments.

For example, when MISO reaches 30 percent renewable energy penetration, some Local Resource Zones are likely to be approaching 100 percent renewable energy penetration. Locations which experience the fastest renewable growth experience challenges first, but beyond 30 percent renewable penetration the system as a whole faces “new and shifting risks” rather than simply local issues.

Today, MISO's renewable fleet accounts for 13 percent of MISO's system-wide energy. Nearly 80 percent of MISO's renewable resources are in the northwest region of MISO, concentrating the current integration challenges to one area.

Looking ahead, as the significant list of generators with executed Interconnection Agreements reach commercial operation (6 gigawatts of new wind, 10 GW of new solar), renewables are expected to account for approximately 20 percent of the system-wide annual energy mix. Beyond that, the 30 percent milestone could occur as soon as 2026.

MISO's Renewable Integration study in a nutshell:

Resource Adequacy

Risk of “losing load” compresses into a small number of hours and shifts into the evening. Analysis shows risk shifting to winter and later in the evening. Resource changes will significantly affect grid performance, with complexity increasing sharply after 30 percent penetration levels. Diversity of technologies and geography improves the ability of renewables to serve load.

Next steps include development of market solutions, improve weather forecasts and incentivize new resource additions.

Energy Adequacy

With renewable penetration levels above 40 percent, there is both a greater magnitude and increased variation of ramping needed. Increasing variability due to renewable generation will require generators to perform differently than they are today.

Existing infrastructure becomes inadequate to fully access the diverse resources across the MISO footprint. Grid technology needs to evolve as renewable penetration increases. Storage paired with renewables and transmission can help optimize energy delivery.

Research to explore solutions, risks and incentives is needed, along with stakeholder education.

Operating Reliability

Resource location and system conditions cause transmission risk shifting to spring and fall and increasing in frequency.

Analysis shows risk shifting to summer shoulder load periods during high solar output. Regional energy transfer increases in magnitude and becomes more variable, leading to a need for increased extra-high voltage transfer capabilities.

Regional energy transfer will increase in magnitude and become more variable, leading to need for more extra-high voltage transmission.

Dynamic stability

Concerning voltage and converter-driven stability, the assessment demonstrates that as inverter-based resources increase in penetration, there is a corresponding decrease in the online thermal generation, which intensifies reliability issues.

Operating stability

Power delivery from ‘weak grid’ areas may need dynamic support capabilities.

Stability issues increase in severity after 30 percent renewable penetration, requiring power system stabilizers. Research on new methods to stabilize the grid are needed.

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Grid operators under scrutiny following regional electric outages

Unusually severe mid-February weather led to power outages on the Electric Reliability Council of Texas (ERCOT) grid and led to rolling outages on the Southwest Power Pool (SPP) system. The tentacles of these rolling outages reached into western Minnesota.

ERCOT, which manages about 90 percent of the Texas electric load, Feb. 15 entered emergency conditions and initiated rotating outages at 1:25 a.m.

About 10,500 MW of customer load was shed at the highest point. This is enough power to serve approximately two million homes.

Weather conditions caused many generating units—across fuel types—to trip offline and become unavailable. Approximately 34,000 MW of generation was forced off the system during this event.

By Feb. 18, ERCOT reported significant progress restoring customer power, although some outages remained. A little over 40,000 MW of generation remained on forced outage. Of that, 23,500 MW was thermal generation and the rest was wind and solar.

ERCOT ceased emergency conditions Feb. 19. As of 7:30 a.m., approximately 34,000 MW of generation remained on forced outage due to this winter weather event. Of that, nearly 20,000 MW is thermal generation and the rest is wind and solar.

Wholesale prices soar

Wholesale electricity prices on the ERCOT power grid



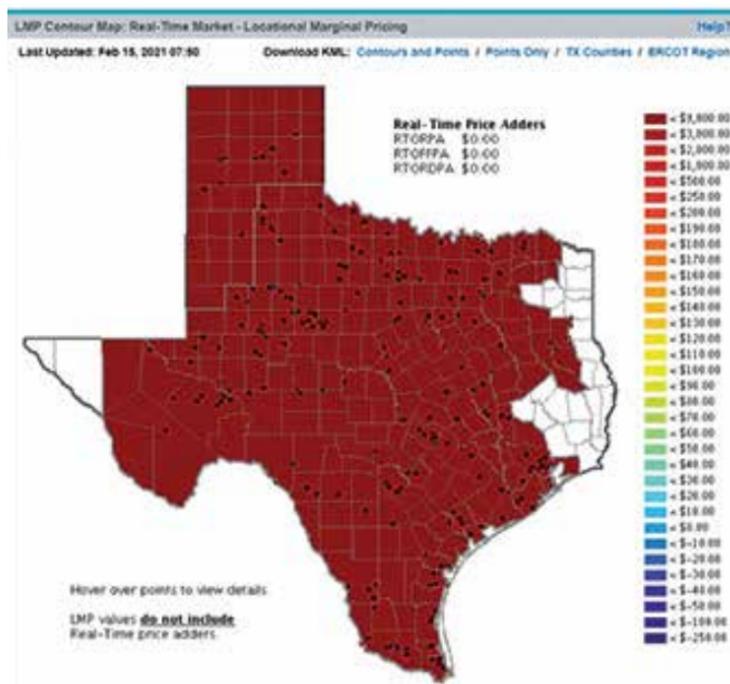
Electric power markets in the U.S., graphic courtesy of the Federal Energy Regulatory Commission. The Southwest Power Pool, which ordered rolling blackouts which affected far western Minnesota, is SPP.

spiked more than 10,000 percent Monday, Feb. 15 as temperatures plummeted and rolling outages were instituted.

Wholesale market prices on the ERCOT grid were more than \$9,000 per megawatt hour late that morning, compared with pre-storm prices of less than \$50 per megawatt hour.

SPP orders rolling outages

The Southwest Power Pool (SPP) Feb. 14 asked customers to conserve electricity use, and said weather drove high demand for natural gas used to heat homes and businesses, straining the gas supply available to generate electricity and noted icy conditions made availability of wind



Locational Marginal Pricing map from ERCOT at 7:50 a.m., Monday, Feb. 15 shows prices of over \$9,000 per megawatt-hour across the bulk of the state.

generation uncertain.

The SPP call to conserve energy reached into the Dakotas, western Iowa and even western Minnesota, through

various utility power suppliers. The Level 3 alert meant that reserve levels had fallen below required minimums and outages and/or planned

blackouts were possible.

SPP Feb. 16 declared an Energy Emergency Alert (EEA) Level 3 starting Feb. 16 at 6:15 a.m. Electric generation in the region was not sufficient to meet the demand. SPP began rolling blackouts to reduce demand.

The rolling outages included 14 states, largely in middle America, including western parts of Minnesota

SPP said the rolling outages were “a last resort” to preserve the electric system as a whole.

“Systemwide generating capacity has dropped below our current load of ~42 GW due to extremely low temperatures and inadequate supplies of natural gas,” SPP said.

SPP warned people in the region should take steps to conserve energy use and follow their local utilities’ instructions.

As of 9:30 a.m., Feb. 18, SPP announced it was no longer under an emergency alert. Due to continuing high loads and other implications of severe cold weather, it remained in a period of conservative operations until 10 p.m. Central time, Feb. 20.

SPP is a Regional Transmission Organization (RTO) that oversees the bulk electric grid and wholesale power market on behalf of utilities and transmission companies.

The temporary outages, noted the grid operators, help protect the grid from longer, more sustained outages.

Investigation in 2011

In the wake of the recent ERCOT, SPP debacle a number of investigations have been launched, including a joint investigation by the Federal Energy Regulatory Commission (FERC) and the North American Electric Reliability Corporation (NERC).

FERC and NERC also issued a joint report and recommendations after an arctic cold front that descended on the Southwest during February 2011. The geographic area hit was also extensive, complicating efforts to obtain power and natural gas from neighboring regions.

The report noted the 2011 storm was not without precedent. There were prior severe cold weather events in the Southwest in 1983, 1989, 2003, 2006, 2008, and 2010. In 1989, ERCOT first resorted to system-wide rolling blackouts to prevent more widespread customer outages. In all of those prior years, the natural gas delivery system experienced production declines.

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Gas prices:

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called for a federal investigation.

The MPUC investigation will dovetail with other existing regulatory dockets, including one prohibiting the disconnection of gas customers during the pandemic emergency.

Regulatory documents prepared in advance of the MPUC meeting noted that on Friday, Feb. 12, reports indicated natural prices increased from approximately

\$3 per dekatherm to more than \$200 per dekatherm.

Most of this increase in price for gas delivered to Minnesota appears to have been weather and demand related.

Market dynamics were unprecedented, a CenterPoint spokesperson said at the hearing. Frigid weather triggered electric blackouts in Texas, which forced gas wells and processing plants to cease operation. There was high demand and a drastic drop in market supply. Prices skyrocketed.

On Feb. 26 a joint meeting of the Minnesota Senate

Committee on Energy and Utilities Finance and Policy and the House Committee on Climate and Energy Finance & Policy also explored the impact of the gas pricing crisis. Jack Kegel and Kent Sulem of MMUA testified regarding the impact of the unprecedented prices on municipal gas utilities. Also testifying were Center Point Energy and Xcel Energy, Attorney General Keith Ellison, Commerce Commissioner Grace Arnold, Minnesota Public Utilities Commission Chair Katie Sieben, and PUC Commissioner Joe Sullivan.

Municipals affected

It appears that the cost impact in Minnesota will be highest for those systems on the Northern Natural Pipeline, which originates in the Southern U.S., where there was great increase in demand and some loss of supply. Preliminary information indicates that gas systems on the Viking and Great Lakes pipelines, which originate in Canada, will see more modest impacts. For those on the Northern Natural system, these unprecedented and virtually unpredictable increases wreaked havoc with the budgets of gas utilities large and small, private and public.

For one Minnesota municipal gas utility, three days of purchasing gas at such prices meant that barely six weeks into the year it had spent more than its entire year's budget for gas purchases. Similar budget impacts are being felt by many gas utilities in the state, said MMUA Chief Executive Officer Jack Kegel.

Most utilities prudently hedged their gas supply price by obtaining a fixed price for most of their gas while paying

daily rates for the rest. But even a well-crafted hedging strategy could not blunt the impact of the runaway prices.

As an example, one municipal gas utility had 70 percent of its normal winter volumes hedged on fixed-price deals. But because of the additional gas it had to purchase due to the unusually cold weather, the utility wound up only 40 percent hedged, with 60 percent of their gas exposed to the extremely high market prices during the cold snap.

How utilities will pay for bills millions of dollars higher than budgeted for is an obvious concern.

Some utilities may be able to cover expenses with reserves, but that could leave them having no safety net in another crisis. Some cities may make intra-budget transfers from other accounts.

Some may need to borrow money. All ultimately must determine what impact these extreme cost overruns will have on customers in terms of higher rates.

Like the investor-owned utilities, the municipal utilities will be studying plans to spread the cost out over time.

MMUA is in contact with the Minnesota Department of Commerce, the Governor's office, and other State leaders, Kegel noted, and also with the American Public Gas Association and American Public Power Association to explore best practices for dealing with these budget breaking prices, as well as what needs to be done long term to prevent another occurrence of this type of problem. "We need to develop market mechanisms that can put the brakes on runaway prices," Kegel said.



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Solar, wind projects mostly unopposed during Minnesota regulatory process

The Minnesota Public Utilities Commission (MPUC) Jan. 28 granted exemptions and a variance to the Andyville Solar Project, LLC, which had applied for a certificate of need for an up to 100-megawatt (MW) project in Mower County.

The proposed project would be located on 1,000 acres. The developer indicated that the power generated from the project will be offered for sale to wholesale customers, including in-state and out-of-state utilities and cooperatives; however, it had not secured a power purchase agreement.

The developer filed a Request for Exemption from Certificate of Need content requirements, arguing that it

is an independent power producer and not a Minnesota public utility with rates regulated by the MPUC.

The developer pointed out that the requested exemptions are consistent with relief previously granted to other independent power producers. Andyville requested exemption from certificate of need application data requirements, including a discussion of the availability of alternatives to the facility.

The developer asserted these data requirements are not applicable because:

- it is an independent power producer and does not purchase power;

- it has no existing facilities in Minnesota for which it might seek improved operat-

ing efficiency, and

- it has no plans to become involved in owning or operating transmission lines beyond what could be needed for interconnection of the project.

The developer also said it need not comply with a requirement to provide “details regarding alternatives,” because it is a renewable energy project.

Wind plant actions

At its Feb. 4 meeting the MPUC:

- required filings regarding a noise complaint directed at the Blazing Star Wind Farm, which was requesting a Site Permit for the up to 200 Megawatt Blazing Star Wind Project in Lincoln County.

- referred to an administrative law judge the application of Big Bend Wind, LLC for a Certificate of Need, Site Permit for the 308 MW Large Wind Energy Conversion System and a Route Permit for the 161 kV Transmission Line in Cottonwood, Martin, and Watonwan Counties, Minnesota.

Indigenous and historic preservation advocates are objecting to plans for the Big Bend project, which would be near the Jeffers petroglyphs.

The petroglyphs are a collection of rock carvings listed on the National Register of Historic Places. The carvings date back 7,000 years and are considered sacred.

- referred to the office of

administrative hearings the application of Red Rock Solar, LLC for a certificate of need for the up to 60 MW Red Rock Solar project in Cottonwood County.

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Municipal plants:

continued from front page

head Public Service (MPS).

The Tyler substation was temporarily out of service as part of the larger grid response.

The City of Luverne and MPS, both Missouri River Energy Services (MRES) members, generated from midnight Sunday, Feb. 14 through the mid-morning of Thursday, Feb. 18.

Luverne and MPS are the only two MRES Minnesota members in the Southwest Power Pool (SPP) footprint. Most Minnesota utilities are in the Midcontinent System Operator (MISO) footprint.

Upon instructions by the Reliability Coordinator of SPP, Western Area Power Administration (WAPA) began to curtail power to substations within the MRES membership, causing power outages in certain communities.

Moorhead rolling outage

The Moorhead Centennial Generating Station, which houses five, 2-megawatt

(MW) diesel engine generator sets, was built 10 years ago, prior to the demolition of the old municipal power plant located on the banks of the Red River.

With an inkling that its generation might be called on, MPS staff the afternoon of Sunday, Feb. 14 prepared to generate, including procuring an on-going supply of diesel fuel. The engines were started at about 10 p.m. The generation was put on-line at 11:30 p.m. Sunday night and ran for 82 hours straight.

In an unprecedented event, at 9:20 a.m. Tuesday, Feb. 16, MPS received a phone call from WAPA that gave the municipal utility 30 minutes notice to shed 20 MW of load. WAPA, on behalf of SPP, had never before imposed rolling blackouts.

Utility staff opened a substation transmission breaker, cutting power to half of the city for 30 minutes. Approximately 9,800 customers were affected. The temperature was 8 degree below zero Fahrenheit, with a wind chill ranging to 40 degrees below zero.

Thankfully, no further outages were imposed.



The Glencoe Light & Power power plant once again proved its worth as part of a reliable electrical grid, by generating electricity at the height of the power supply emergency. This partial view of the plant was taken during a recent MMUA Generation School.

“It was a 30-minute ordeal,” said MPS General Manager Travis Schmidt. The rest of that Tuesday was “touch and go.”

Wednesday and Thursday were relatively calm (except for a water main break late Wednesday night), and MPS was told to shut down generation at 10 a.m. Thursday morning. The electric grid was still strained, and MPS was again called on to generate from 10 p.m. Thursday until the early morning hours of Friday. Utility staff made adjustments and modifications as necessary and despite the frigid temperatures MPS generated without a glitch.

“It was a long week,” Schmidt said.

A local transmission loop expedited the MPS load shedding planning, which divided the city into sections. The last

major multi-day outage in Moorhead occurred approximately 50 years ago, which led the utility to obtain a second transmission feed into the city.

The utility’s wind and solar generation had a negligible impact as it covers less than 1 percent of the system load.

While staff handled technical issues with aplomb, Schmidt, an electrical engineer by training, was also tasked with handling communications. And with the short notification from SPP, MPS had “no ability to give customers fair warning.”

Improving communication will be an area of focus going forward. The City of Moorhead hired a communications person the day of the outage, so the entities are discussing how they can work together on public relations issues.



Detail from the Windom municipal power plant.

Numerous utilities generated

Southern Minnesota Municipal Power Agency member units were called on by MISO to run during the cold snap. Units running include in Grand Marais, Litchfield, Preston, Saint Peter, Mora, New Prague, North Branch, Wells, Princeton, Blooming Prairie, Redwood Falls and Spring Valley. Rochester Public Utilities was among the other municipal utilities that also generated.

Central Minnesota Municipal Power Agency member units in Glencoe and Windom racked up significant hours of operation during the emergency, particularly on Feb. 17. Units in Kenyon and Granite Falls also generated.

The municipal power plants helped reduce the impact to the overall grid.

Natural gas supply was tight and expensive, so that also became a factor in which electric generators were called on.

The municipal utilities can be proud of how the units have run and the great job the employees at our member utilities have done in running them under tough conditions at all hours. The municipal power plants again proved the value of dispatchable local generation in maintaining system reliability.

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MMUA resumes in-person training with Meter School and Pre-Conference

MMUA held its annual Basic Metering Pre-Conference Feb. 9-10 and Meter School Feb. 10-12. The schools were held at the MMUA Training Center in Marshall.

While the COVID held our numbers down it also afforded an opportunity for more personal instruction. Twenty-four people attended the Pre-Conference and 28 the Meter School.

The schools interspersed classroom and hands-on instruction with a wide variety of electric metering equipment.

The Pre-Conference served as a refresher course on basic metering, or as an introductory course for those with little metering experience.

Meter School participants selected either a Basic/Intermediate or Advanced level of instruction. The Advanced Class included an exam that participants self-corrected to



MMUA's Training Center provides a spacious, if spartan, area for indoor training. Social distancing was no problem at the school. Note the various work stations for hands-on training in the foreground.

help focus training needs.

Both classes were flexible and allowed participants to progress at a pace that fit their motivation and abilities.

Students had the opportunity to troubleshoot problems on more than 15 different workstations. This allowed them to work through scenarios encountered at their own utility.

As with all MMUA trainings, the school offered ample opportunity for discussion among the participants and questions and answers with the instructors.

Main instructors were Larry Chapman of Chapman Metering along with his staff, and John Pollard of TSTM, Inc. MMUA staff members Cody Raveling, James Monroe and Bruce Westergaard also helped supply instruction.

April 15 deadline set for MMUA Tom Bovitz Scholarship contest

The deadline is April 15 for utilities to forward local winners in the Tom Bovitz Memorial Scholarship Award contest to MMUA.

Local deadlines will need to be set earlier, to allow the local governing board (or its designee) time to review the entries. Many members, with necessary local political support, award their own scholarships locally to encourage participation.

A group of MMUA members will select the first, second, third and fourth place winners statewide. MMUA will announce the winners by mid-May.

Our \$5,000 annual fund is split into four prizes and awarded to essay contest winners who plan to attend a post-secondary educational institution.

The local governing body of the utility picks a local winner. Every MMUA member may then enter the one local essay contest winner to the state contest.

This program was created as a public relations tool to increase the awareness of public power and create goodwill in your city for your utility.

Students can find resource materials at the MMUA website, the American Public Power Association website, and often from the local utility.

Please contact Steve at MMUA if you have any questions or comments. Thank you for helping make this program a success.



James Monroe, Brady Swanson of Fosston, Hunter Connelly of Delano and Judd Guida of Tyler (from left to right) inspected a work station. Monroe, MMUA's apprentice training instructor, works with each of the men on their home systems during his travels around the state through MMUA's On-site Apprentice Lineworker Training Program.



photos by Steve Downer

Fairmont's Wade Williams (left) and Jesse Lloyd participated in the Advanced track at the Meter School.

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Austin Utilities (AU) issued a natural gas peak alert Feb. 15 through Feb. 17. AU asked its customers to turn their thermostats down to 68 degrees during the day and even more at night.

The rare alert was issued as widespread cold reached from the northern plains to Texas and the East Coast. Increased demand pinched supplies and increased prices.

Owatonna Public Utilities issued a similar alert, through Feb. 18.

Sustained below zero temperatures and low snow cover contributed to frozen water lines and water main breaks in Minnesota in mid-February.

Around the State

Shelly Carlson in the new mayor of **Moorhead**.

Carlson was appointed to the job of mayor following the resignation of Johnathan Judd. Judd left the post to take a Minnesota District Court judgeship.

Carlson was elected to the Moorhead City Council in November of 2018.

Luke Peterson is the new general manager of **Hibbing Public Utilities**.

Peterson for the previous five years was a key accounts

It is not unusual for municipal utility people to eventually 'pass the torch' to a successor. At Willmar Municipal Utilities, however, Commissioner Carol Laumer recently passed the hard hat to Bruce DeBlick. Laumer left the Commission, per its term limit rule, after serving her third three-year term. DeBlick, with a long history of service on the city council and Commission, is currently serving his second three-year Commission term. DeBlick also replaced Laumer on the MMUA board last year.



sited adjacent to HUC's Plant No. 2, on the city's eastern edge.

The **Willmar City Council** Feb. 16 approved the minutes of the Feb. 8 Willmar Municipal Utilities Commission meeting, thereby giving the go-ahead to demolish the 96-year-old Willmar Municipal Utilities power plant. The policy boards left the window open until Sept. 1 for last minute proposals to re-purpose the building.

Demolition cost is pegged at \$3.7 million. The work is likely to occur next year.

representative for Minnesota Power (MP). Prior to that, he worked for a decade as a financial analyst for Allete, the parent company of MP.

Peterson started with Hibbing on March 1.

Charyl Ulferts is the new finance director for the **City of Windom**. Ulferts comes to Windom with 17 years of government accounting and municipal utility knowledge, most recently with the City of Lakefield.

Henry Tweten, 97, passed away Sunday, Jan. 31.

Tweten, an attorney, served on the **East Grand Forks** city council from 2012-18 along with two terms in the 1960s. He also served on the Water & Light Commission from 1996-2001.

Tweten served in the U.S. Army during World War II and received a Purple Heart.

Detroit Lakes Public Utilities has pledged up to \$100,000 for operational support in each of the next three years to the Detroit Lakes Community & Cultural Center. The Center was forced to close its doors for half of 2020 due to state-mandated safety precautions designed to slow the spread of COVID-19.

With the **City of Baxter** water treatment plant undergoing a weeks-worth of repairs, Brainerd Public Utilities stepped up to supply water to its neighboring city.

The **Hutchinson Utilities Commission (HUC)** recently awarded a bid for a 766-kilowatt solar array at an installed cost of just under \$1 million. The turnkey project includes all necessary equipment, materials and design, manufacturing and installation services for the ground-mounted system, capable of producing an estimated 1,100,000 kilowatt-hours/alternating current annually.

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Power transfer capacity between Western markets subject of concern this year

Editor's note: Though our climates are much different, the set of issues policymakers wrestle with in California and the Midwest are much the same. As it was when retail electric competition foundered on the rocks of Enron and a 2000-2001 electric supply crisis in California, it is our hope that we learn lessons from past experience.

California is counting on electricity imports from other regions to maintain electric service this summer. A recent report casts doubt, however, on the ability of the neighboring Desert Southwest region to supply electricity in a time of need.

That conclusion can be

drawn from the Western Assessment of Resource Adequacy Subregional Spotlight: Desert Southwest (DSW), a report released Jan. 29 by the Western Electric Coordinating Council (WECC).

WECC divides the Western Interconnection into five subregions to account for geographic, operational, and system diversity. The DSW region includes Arizona, New Mexico and the southwestern tip of Texas.

The DSW regional electric system, said the report, "needs external assistance to maintain resource adequacy" and this year "could experience as many as 415 hours in which the One Day in Ten

Years (ODITY) threshold of resource adequacy is not maintained."

Even with all planned resource additions and importing excess energy from other subregions, noted the report, the DSW subregion is "at risk for unserved energy."

Along with analysis, the report makes several findings.

As more variable resources are added, a larger planning reserve margin is needed to compensate for variability in the system and remain resource adequate.

For 2021, an annual planning reserve margin of 16 percent is enough to maintain the median resource adequacy ODITY threshold for the DSW subregion. However, in the months when variability in energy supply and demand is highest (March and December), a planning reserve margin near 27 percent may be needed to maintain the ODITY threshold.

In 2021 and beyond, even with all planned resource additions, the DSW subregion needs external assistance to maintain resource adequacy.

The number of hours at risk increases for between 2022 and 2024.

As more demand or consumer-side programs, such as home batteries, electric vehicles, roof-top solar, or demand response programs are added to the interconnection, variability in demand will continue to grow.

Increased variability means more uncertainty in demand forecasts, which may affect resource adequacy for the entire interconnection.

Baseload resources account for about 85 percent of the available generation in 2021 and remain relatively stable through 2025. The amount of available generation for the peak demand hour is expected to remain relatively stable over the next five years, but solar resources are expected to increase 35 percent. In future years, as more variable resources are added, the variability of the overall resource portfolio is expected to increase.

The DSW subregion's resource portfolio is less variable than other subregions, though it is still subject to a range of availability based on the probability distribution across the subregion. In rare cases in which generation availability could be extremely low, meeting demand while maintaining operating reserves may be difficult.

External assistance, or energy that is available to import from other subregions, can only be counted on when

the energy and transmission are actually available.

If all the WECC subregions experience low resource availability at the same time, the potential for them to provide imports is reduced by more than 75 percent from about 20 GW to about 5 GW. If all the other subregions experience high demand and low resource availability at the same time, imports into the DSW subregion may not be available.

Conclusion

The assessment indicates that, to maintain the ODITY threshold, entities in the DSW

subregion need to build the resources currently included in the construction queue.

At times, the subregion will also depend on imports from other subregions to maintain resource adequacy.

The growing variability in both supply and demand across the Western Interconnection increases the risk that imports may not be available to maintain the ODITY threshold. Therefore, the subregion should consider the degree to which it plans to rely on imports from other subregions and consider supplementing its own resources to remain resource adequate.



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Moody's affirms Heartland Consumers Power District rating with stable outlook

From APPA

Moody's Investors Service has released its latest credit opinion of South Dakota-based Heartland Consumers Power District with a rating

of A2 and a stable outlook.

Moody's previously upgraded Heartland's rating to A2 from A3 in 2018, shortly after Heartland divested of ownership in the Missouri

Basin Power Project (MBPP), namely 51 megawatts from Laramie River Station.

"This rating reflects not only the actions Heartland has taken to bolster our profile and create a stable future,

but also the sound financial metrics of our customers," said Heartland Chief Financial Officer Mike Malone.

The ratings reflect the weighted average credit quality of Heartland's 27 full and

supplemental requirements members. It also reflects the steps taken by Heartland to "right-size" its existing generation capacity through divestiture of capacity assets, including the stake in MBPP.

The sale of MBPP allowed Heartland to pay down outstanding credit line drawings related to bringing Laramie River Station into compliance with environmental standards, Heartland noted.

Heartland's current base-load resource, Whelan Energy Center Unit 2 (WEC2), is in compliance with existing regulatory standards and not anticipating any environmental capital expenditures in the near future, it said.

Moody's recognized other actions Heartland has taken to strengthen their position and decrease costs.

Heartland issued \$35 million in taxable debt in 2018 to buy-out a transmission service agreement. The buy-out led to the stabilization of transmission costs and resulted in cash flow savings.

Moody's also noted Heartland's fairly diverse capacity available, with about 27 percent being coal-based from WEC2.

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With outside supply disrupted, Moose Lake plant generates power for 16 days

A portion of Moose Lake was plunged into darkness approximately 7:30 p.m., Monday, Feb. 8 when a regulator failed in one of the utility's two substations. Water & Light personnel responded promptly to the emergency, and began generating power at a municipal power plant. Electric service was restored at 1:45 a.m.

In the meantime, a temporary shelter had been established at a nearby school. Temperatures that night plunged to approximately 29 degrees below zero Fahrenheit.

Necessary replacement equipment was quickly sourced (MMUA assisted with this task). Electricity started flowing through the repaired substation to customers the morning of Feb. 25, with the outside supply taking over from the municipal generation.

The failure occurred at the North Substation, across the street from the historic municipal power plant. This substation was improved in 2016 with a new control house, controls and underground feeders.

The utility also operates the South Substation, which



Moose Lake Water & Light's North Substation is visible to the right of the original municipal power plant in this 2016 MMUA photo. The power plant, which dates to 1933, has been expanded and upgraded over the years, including in 2013. The substation was substantially improved in 2016.

feeds the Minnesota Correctional Facility, a hospital and other customers.

In 2003 the municipal generation received a \$2.25 million upgrade, including three new Caterpillar 2,250-kilowatt engine-generator sets. One engine was placed in the downtown power plant and two engines adjacent to the South Substation. The South Substation and ancillary support infrastructure were also improved at this time.

Moose Lake buys power at wholesale from Lake Country Power Cooperative (Great River Energy) and receives capacity payments to keep municipal generation at the ready.

The municipal power plant first went into service in August 1933. Moose Lake was connected to the electric grid in 1979, when a 69,000 volt line connected to the power plant substation. The power plant, which has been remod-

eled and upgraded over the years, went on a standby basis at that time.

The cause of the February failure is under study. Further improvements to the municipal system will be considered in light of lessons learned from the episode. A natural gas line filter froze in sub-zero temperatures and generation switched to diesel fuel, said Superintendent Harlan Schmeling. Strength-

ening ties between the substations will also be considered.

One thing that became clear during the interruption of outside power supply was the skill and dedication of the Water & Light employees, including the five lineworkers and superintendent who manned the power plant around the clock for the duration of the approximately 16-day event.

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The Wright County (Minn.) Board Jan. 26 approved a moratorium on solar projects. The moratorium could last up to a year. The county has 15-20 solar sites and has worked with numerous developers. The county adopted a solar ordinance five years ago. Issues brought up by citizens include weeds allowed to grow around structures, water runoff problems and the cost of removing structures when they are past their useful life.

Unpaid bills for four California investor-owned utilities reportedly surpassed \$1 billion in December, an increase of more than \$650 million from the February 2020 level.

The California Public Utilities Commission imposed a moratorium on disconnections for non-payment last spring, and recently extended those measures through summer.

A rulemaking on how to work out of the predicament is underway.

Evergy, the provider of electricity for most of the Kansas City region, Feb. 14 asked customers to conserve electricity use "as much as possible" until Wednesday, Feb. 17 to avoid possible power outages.

The company suggested customers turn their thermostats between 68 and 65 degrees and turn off unnecessary lights, among other things.

The National Wildlife Refuge Association along with other groups filed a federal lawsuit Feb. 10 against the Rural Utilities Service and the U.S. Fish and Wildlife Service over the Cardinal-Hickory Creek power line, according to a release from the Environmental Law & Policy Center.

The suit alleges the agency failed to consider alternatives to the high-voltage line.

The line is operated by the American Transmission Company and partners Dairyland Power Cooperative and ITC Midwest. It was approved by the Wisconsin Public Service Commission.

The Cleveland (Ohio) City Council issued two Feb. 12 subpoenas to the Delaware and Ohio subsidiaries of Generation Now, a nonprofit

see facing page please

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that pleaded guilty to racketeering charges in a \$60 million bribery scandal that has embroiled the Ohio legislature. The council seeks to identify the funding sources of Consumers Against Deceptive Fees, a non-profit entity that sought to undercut the municipal utility

So many Decorah, Iowa residents are putting up solar panels and installing small turbines that Alliant Energy, which serves the city of 7,700, said it is nearing the limit of how much distributed energy it can host without degrading the quality of electricity.

The utility is installing a \$2.5 million battery system to store the energy and regulate voltage.

Alliant Energy announced Feb. 2 that it will shut down the Columbia Energy Center by 2025. The 1,100-megawatt coal-fired power plant, located near Portage, Wisc., has been in service 45 years. The move allows the utility to avoid an estimated \$250 million in maintenance and upgrade costs, while allowing the utility to transition to renewable energy sources.

Madison County, Iowa supervisors in December limited the number of wind turbines in the county at 51 — the current figure.

In 2019, the supervisors passed a year-long moratorium on new solar and wind development that ended last October. The county held numerous meetings and forums, and it was clear there was substantial opposition to further wind energy development.

MidAmerican Energy filed a late January lawsuit, charging the ordinance would prevent construction of a 52-turbine wind project.

Iowa generated 42 percent of its electricity from wind in 2019, the largest share of wind power for any state nationally, the U.S. Energy Information Administration says. The state ranks second in the U.S. to Texas for its of wind-generating capacity.

The Tennessee Valley Authority has proposed six new natural gas combustion turbines with a combined generating capacity of 1,500 megawatts at two plants. The new gas units would replace older, less efficient gas fired generators, which have a combined generating capacity of 1,400 MW. The plants identified for the work originally burned coal.

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1 www.bls.gov/oes/current/oes499051.htm | 2 www.bls.gov/oes/2017/may/oes499052.htm
 3 www.bls.gov/oes/2017/may/oes472152.htm

MMUA adapts to situation, holds annual Legislative Rally in virtual format

MMUA held its annual Legislative Conference Feb. 10. The meeting was held virtually, after being cancelled in 2020 during the onset of the COVID-19 pandemic.

Minnesota Pollution Control Agency (MPCA) Commissioner Laura Bishop started the program with an overview of the Governor's sub-cabinet on Climate Change, which she chairs.

Commissioner Bishop was followed by Sen. David Senjem and Rep. Jaime Long, who chair the committees with jurisdiction over energy issues in their respective chambers. Both gave strong support for passage of the Energy Conservation and Opti-

mization (ECO) Act, and both expressed a desire to find a reasonable compromise on a Clean Energy First bill, although they differ as to what should be considered clean.

Jessica Burdette from the Division of Energy Resources at the Department of Commerce provided an overview of the Administration's energy legislation objectives and also discussed a proposed change in the start and end dates for the Cold Weather Rule.

The conference wrapped following an update by the MMUA Government Relations team on specific bills MMUA is working on and how they relate to the position statements approved by

the Government Relations Committee at the end of 2020.

Approximately 75 municipal utility officials participated in the online event. A

sincere thank you to all who attended.

As in 2019, the event was held during what turned out to be the coldest week of the

year. Regrettably, the dates of the conference are dictated by the dates of the regular legislative session.

Thirteen graduate from Firstline Supervision program

Thirteen municipal employees in recent months graduated from the MMUA-Central Lakes College Firstline Supervision program. The final session was held virtually.

Graduates from January include: Wendy Neu, Delano Municipal Utilities; Michelle Canterbury, Elk River Municipal Utilities; Brian Clausen, Owatonna Public Utilities;

Joel Trites, Owatonna Public Utilities; Scott Bunke, St. Charles Light & Water; Jacob Yushta, St. Peter Municipal Electric.

February graduates include:

Mike Engelen, City of Chaska Electric Dept.; Chris Anderson, City of Granite Falls; Nick Price, New Ulm Public Utilities; Curtis Thompson,

St. Peter Municipal Electric; Jamie VonBank, Shakopee Public Utilities; Justin Steinbrink, Thief River Falls Municipal Utilities; Chad Schultz, City of Two Harbors.

MMUA congratulates our recent graduates and thanks the cities and utilities that sent them.

Upcoming Events

There is hope for a relatively normal year in 2021, with more known about COVID-19 and the rollout of vaccines. We do not know the impact of the pandemic and state-imposed restrictions going forward, but we are moving ahead with our meeting/training schedules. Some meetings and training are better held in person, and the deeper into the schedule we look, the more positive we are that these get-togethers will occur as scheduled.

Substation School

April 6-8, Anoka

In addition to classroom instruction on a variety of substation-related topics, participants will also tour two of Anoka Municipal Utilities' substations, plus Federal® Cartridge (tentative).



Who Should Attend?

This School can benefit anyone who works in a substation environment or those interested in learning more. Topics and presenters include:

Substation Maintenance and Inspections

Paul Schlies, Energis High Voltage Resources

Learn about the industry's best practices on a variety of operational concepts and maintenance issues.

Proper Switching Techniques

Jamie Sieren, Power System Engineering

Gain a better understanding of the steps that need to be taken, within your substation, when dealing with switching procedures.

Your Substation: The Importance of Understanding Your Equipment

Dave Krause, Krause Power Engineering, LLC

Increase your understanding of the major systems and their associate components typically found in your substations.

Tours – Enterprise and Garfield Substations

Following a safety briefing, we'll travel to two of Anoka Municipal Utilities' substations to learn about some recently completed updates.

The Ins and Outs of a Portable Power Substation

Learn what goes into a mobile substation and the benefits of portability or as a temporary or backup power solution.



Deadline to register is March 12!

Generation School

April 20-22, Princeton, Elk River and additional locations

Along with instruction from knowledgeable speakers, participants receive hands-on instruction on either Fairbanks Morse or Cooper Bessemer engine sets, on a variety of topics.



Classroom instruction on April 20 and April 22 will be held at the Mille Lacs Historical Society, adjacent to the Princeton Public Utilities. Following training on April 20, attendees will tour Connexus Energy's Ramsey Renewable Resource Station and Elk River's Waste Reclamation (landfill gas generation) Plant.

Hands-on instruction on April 21 takes place at the following locations:

- Fairbanks Morse - Princeton Power Plant
- Cooper Bessemer - Elk River Power Plant

Bussing provided for tours. Register before March 19 for best rate!

Underground School

May 11-14, MMUA Training Center, Marshall

Minnesota Municipal Utilities Association and our partners—Minnesota Rural Electric Association and American Public Power Association—are pleased to offer the 2021 Underground School.



The Underground School offers a hands-on training track with a variety of training sessions and an advanced technical course.

Multi-session courses include: Troubleshooting Primary Outages & Implementing Switching Procedures; Directional Drill Operations; Troubleshooting Secondary; and 600-Amp Terminations. The Advanced Course will focus on Key Considerations When Choosing an AMI Metering System.

Register by April 9 for best rate.

MN Public Power Walleye Tournament

June 6, Rush Lake,

See the MMUA website for more information.