



WISCONSIN WORK

Company helps turn site into renewed heart of Ashland

XTRA

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Content

4 Innovator and I Deliver Awards

The most recent winners are announced, along with descriptions of their award-winning work.

6 Demand Response

New demand-response programs are helping balance the supply and demand of electricity.

9 Ashland Project

A massive company effort is now wrapping up in Wisconsin thanks to the work of an award-winning internal team.

14 STEP Program

The utility industry has developed a nationwide program to help maintain the reliability of the U.S. electric grid.

16 Carbon Report

Company's vision to deliver 100 percent carbon-free electricity to customers is now backed by a scientific study.

18 People

The most recent Friends We'll Miss and Retirements.

On the Cover

After years of discussion and work, Xcel Energy has helped turn a site along the shores of Lake Superior into the renewed heart of Ashland, Wisconsin. Pictured here, an overview of the project, with operations occurring both in the bay and on land. For more information, please see page nine.





Stepping up to the challenge

(Editor's Note: Ben Fowke, chairman, president and CEO, periodically writes a blog on XpressNet, as well as other articles and communications. *Xtra* features Fowke's comments on a recurring basis to share his thoughts with a wider audience.)

When customers need us the most, Xcel Energy employees step up to the challenge. Whether it's responding to a gas emergency or an ice storm that knocks out part of the grid, we work hard to safely and quickly restore electricity or natural gas service.

Look at a recent outage in Moorhead, Minnesota from a customer point of view. It is 20 degrees below zero, and natural gas service has been disrupted to your home and almost 1,000 others. You don't care that a snow plow damaged a gas meter – an outage is an outage. What you care about is the answers to two questions: 1.) When will the gas be restored? and 2.) Will my water pipes freeze in the interim?

In this scenario, our teams stepped up, provided space heaters to customers who needed them and restored service to nearly 1,000 homes within 24 hours – outstanding work done in extremely challenging conditions.

As I reflected on this event and a few others during this frigid winter, it occurred to me that as an organization we do a great job of recognizing our teams that respond quickly in challenging conditions like the one in Moorhead this winter or Puerto Rico last year. From a recognition standpoint, we can sometimes overlook our teams who work day after day ensuring reliable service and preventing outages from occurring in the first place, but it's important to recognize those teams as well.

So many employees are needed to deliver on our promise of outstanding reliability...our coal yard supervisors who work outside when the wind is

howling, our system and control room operators who make sure the plants are operating effectively, and the substation engineers who make sure the energy correctly flows from high-voltage transmission wires to our distribution network.

We have more than 7,500 employees and thousands of contractors working in Operations. Kent Larson, who is responsible for all of this work, has a lot on his plate. Earlier this year, Kent provided me a report of all the work Operations executed last year. This, of course, is in addition to keeping the lights on more than 99 percent of the time. I want to share a few highlights with you:

- Completed significant foundational work in Colorado for the Advanced Grid Intelligence and Security initiative.
- Completed remediation projects in Ashland, Wisconsin and Fargo, North Dakota that date back decades to predecessor companies.
- Began construction on several wind farms throughout our service territory.
- Through the Supply Chain department, provided \$315 million in benefits to the organization, primarily through sourcing savings.
- Placed more than 530 miles of new transmission lines and 18 new substations into service, a majority coming in the Southwest.
- Received approval from the FAA to inspect transmission lines using drones flown beyond the operator's visual line of sight.

This is far from an exhaustive list. There are countless projects under way in Operations to help lead the clean energy transition, enhance the customer experience and keep bills low. All of that work, of course, is in addition to balancing the system and keeping the lights on every day.

Please know that the efforts of Operations' employees are appreciated – even if we don't say thank you as often as we should. ←

Innovator and I Delive



(Editor's Note: Innovator and I Deliver awards at Xcel Energy reward performance when teams and employees deliver greater-than-expected results. These award opportunities are designed to help fuel collaboration, innovation, continuous improvement and an enhanced customer experience. Xtra is running a series of articles on select winners.)

Innovator Awards

Electric Vehicles

A 14-member, cross-functional team recently developed various new innovative efforts regarding electric vehicles (EVs) by using a fast-paced, product-development process. The team created an offering to customers of a suite of EV-related products and services, placing the company in the EV marketplace both today and tomorrow.

The effort also fosters load growth through the electrification of transportation and creates earnings opportunities. Through the effort, Xcel Energy will partner with several large customers, along with others, to work toward joint sustainability targets.

The initial investment opportunity is \$20 million of new capital that can be placed into rate base. By establishing a positive regulatory precedent, this number could grow, possibly in short order.



Command Center

A seven-member, cross-functional team led the effort to create the Enterprise Command Center (ECC), which centralizes monitoring, reporting and incident-response functions across the company. Rather than just duplicating existing functions, analysts assigned to the ECC "watch" correlate multiple data sources into a single, common operating picture, which provides senior decision makers a near-real-time understanding of an event, its impacts and other potential issues across the company.

This initiative promises to result in operational improvements through faster recovery and response times, as well as increased security and employee safety. For instance, there recently was a rapid employee notification of a potential active

shooter in a facility located next to the 1800 Larimer office in Denver, as well as warnings of extremely hazardous weather conditions to employees traveling outside the service territory.

Additionally, the integration of the ECC with the Security Operations Center, Cyber Defense Center, IT Operations Center, Network Operations Center and other operations lays the groundwork for future capabilities to monitor real-time operations and technology incidents – and then correlate events to quickly identify significant threats or risks, and improve response and recovery from business impacts.



Transmission O&M

A 12-member team completed a more than 30 percent productivity-improvement effort that equaled between \$6 million and \$8 million in annual O&M savings. The effort came as a result of bottom-up innovation and a "let's get better every day" continuous-improvement culture. In addition, the improvements identified will materially enhance safety, compliance and reliability.

Through the XE1 effort, the team implemented process and productivity improvements worth 127,000 labor hours – a savings opportunity of 32 percent of all hours worked. The improvements were the result of more than 150 specific ideas, with every single employee in the department involved.



er Awards announced

New lean-methodology approaches were used to identify and create value. These new tools included daily huddles, pull planning and a focus on reducing waste.

Some specific areas of work included reducing overtime and contractor labor; eliminating preventative and corrective maintenance backlogs; and moving a small number of frontline employees to dedicated safety roles.

I Deliver Awards



Mankato Energy Center

A cross-functional team helped lead the Mankato Energy Center acquisition process through time-sensitive negotiations, data analysis and the preparation of the associated regulatory filing.

When Xcel Energy learned that owner Southern Power was interested in selling the facility, the team

faced a short timeframe in order to reach a potential purchase agreement. The effort required quickly putting together an internal team to evaluate the facility and finalize an agreement.

A regulatory filing also was required after a purchase agreement was reached. The team also worked in short order to complete the filing on time.

The team recognized the importance of the effort to the company and made a commitment to get it done. Team members went the extra mile and worked well together with the end result in mind.

The Mankato Energy Center currently provides power to Xcel Energy customers under a power purchase agreement. The purchase will save more than \$100 million over the life of the PPA.

The Mankato Energy Center is a natural gas combined-cycle plant. A second generating unit, now under construction, will bring total capacity at the plant to 760 megawatts. Xcel Energy's purchase of the facility is dependent on regulatory approval.

Security Escape Rooms

Security Escape Rooms were brought into Xcel Energy as an innovative approach to training, allowing participants to gain hands-on experience identifying security threats and applying good security practices.

A 21-member team of employees from across Enterprise Security Services helped run more than 100 groups through the escape rooms last fall.

In addition to teaching employees more about security, the rooms also allow ESS staff to connect with small groups of employees from across the company. The discussions led by ESS help employees understand how to apply security principles at work and at home, and how to recognize and respond to security threats.

This approach to training also takes participants out of the computer-based training environment, and into a tangible and interactive training arena. And groups going through the escape rooms practice teamwork, communication and problem-solving skills.

Texas Environmental Management

Seeing an opportunity to improve a process, an environmental analyst in Texas worked to design a data analysis tool to streamline data extraction and reduce the time needed to



synthesize large amounts of data.

The analyst created a workbook to automatically pull emissions data from one central database, which contains emissions data for all the monitored generating units in the Texas-New Mexico region. This capability allows for the efficient review of the data across multiple units and facilities.

With the process improvement, emissions data can now be pulled within minutes, freeing up much needed time to analyze the information across the 21 generating units in the region that follow the process.

Power plant analysts are required by the U.S. Environmental Protection Agency to review data from continuous-emissions-monitoring systems to ensure systems are operating within federal and state air emission standards.

The process is completed at least weekly at every power plant and has historically been a large sink of productive time for plant analysts as the analysts would have to log in to each individual unit to review data. The analyst is now working with other regions to roll out the new tool to increase efficiency.

Comanche Wireless Technology

A senior controls engineer recently undertook a number of process-improvement projects, leading to innovative solutions.

In one example, the engineer led the installation of wireless flow transmitters at Comanche Generating Station Units One and Two in Colorado. The flow transmitters are a requirement of the U.S. Clean Water Act, which requires cooling tower structures to have integrated designs that minimize adverse impacts to water ecology.

The introduction of the new technology enabled the company to monitor flow measurements, meeting regulatory requirements and saving more than \$25,000 in signal cabling and labor costs. It also opened the door for future enhancements at Comanche. ←





DEMAND RESPONSE

Award-winning team creates new programs

On hot summer days as the demand for energy hits its peak, many utilities offer demand-response programs, which ask customers to reduce their energy use in exchange for any number of incentives and provide utilities with improved system reliability.

Demand response provides customers an opportunity to play a role in the operation of the electric grid by reducing or shifting their energy use during peak periods, helping balance the supply and demand of electricity.

Xcel Energy's Demand Response team recently won an "I Deliver" award for its work to create new programs, among other successes. The team moved five new programs into production last year – creating positive impacts for 40 commercial and more than 6,200 residential customers.

The launch of another five programs is planned this year. They will positively impact another 2,400 commercial customers and help the company manage a sizeable load of 600 megawatts – roughly the power generated by a large generating unit, said Brian Doyle, Demand Response team lead.

The programs launched in 2018 included: Peak Partner Rewards, Critical Peak Pricing, Load Management Standard Offer and AC Rewards (in both Minnesota and Colorado).

For instance, AC Rewards relies on the use of a smart thermostat, instead of the older Savers Switch box placed

on the outside of air-conditioning units. The program allows temperatures in participants' homes to rise by four degrees, instead of simply shutting off cooling for defined periods of time, he explained, providing a better customer experience.

Under Peak Partner Rewards, small- to medium-size commercial customers receive a modest upfront and monthly payment for agreeing to curtail their energy use during peak-use periods. If they are curtailed, however, they are paid well for their help and inconvenience.

"We get a reduced rate throughout the year, and then in the summer, when Xcel Energy calls a load-reducing event, we shut off as much manufacturing as we can to help reduce the load," said one customer. "When they call, we reduce."

"We're buying flexibility, and our customers are saving money," Doyle added.

The team also implemented a new system to track demand response programs' use and effectiveness, called appropriately the Demand Response Management System (DRMS). The system entails new software, and leveraging this new tool is allowing for the expansion of new demand response programs, Doyle said.

The first phase of the project involved getting the new software installed and configured. The second phase will entail integrating existing company systems into the new system.



Customer Help
Demand response provides customers an opportunity to play a role in the operation of the electric grid. For instance, AC Rewards relies on the use of a smart thermostat (top of page six) instead of the older Savers Switch box (above), which was placed on the outside of air-conditioning units.

The team’s project responsibilities – conducted in conjunction with and in addition to their daily responsibilities – included testing, user training, customer meetings, system development, call-center education and account-management instruction.

“The DRMS project is important to our future success because the growing demand response business couldn’t be supported by our existing legacy systems and processes, unless we significantly increased headcount or invested more time and money in aging technology,” he said. “The new system will complement our advanced-grid efforts and can work via automated signals from the distribution system.”

Demand response programs have been used since the 1980s, but about a decade ago, the environment for demand response programs began to change nationally. Xcel Energy needed to evolve to meet market conditions, and a team was formed to take on that task in 2016.

The company’s six-member team manages all demand response residential programs, as well as all commercial and industrial programs, including new efforts to reach mid-market, small- and medium-size businesses.

“We are continuing to evolve our business through a robust product-development plan,” Doyle said. “We have around 25 new programs set to launch between 2018 and 2021 under the idea of appealing to many different types of customers.

Overall, the evolving thinking around residential-based demand response is that utility companies need to educate customers when to consume energy, he said.

“You can’t expect customers to change their consumption behavior unless you give them the information and tools to do so,” Doyle said. “In the end, we want to provide simple, easy-to-participate-in programs where the customer doesn’t have to do or know a lot – and can use energy at the right times with our assistance, and in turn help us better manage the grid.” ←

Xcel Energy a ‘Most Admired Company’ once again

Xcel Energy has been recognized by Fortune Magazine as one of the World’s Most Admired Companies for the fifth consecutive year. This year, the company ranked as the second most admired electric and gas company in the nation.

“We’re honored to be recognized as an industry leader by Fortune magazine,” said Ben Fowke, chairman, president and CEO. “This shows that industry peers recognize the value we bring to our customers, and is a direct reflection of our employees’ dedication to delivering clean, reliable and affordable energy to the communities we serve.”

Xcel Energy recently announced its vision to achieve 100 percent carbon-free electricity by 2050, the first utility in the nation to do so. It also plans to reduce carbon emissions 80 percent from 2005 levels by 2030, while keeping bills low for customers.

The magazine surveys executives, directors and industry analysts about companies in their industry. The rankings are based on nine attributes such as investment value, social responsibility, ability to attract talent, and quality of management and products.

Fortune collaborated with Korn Ferry on this reputational survey of the 1,000 largest U.S. companies ranked by revenue, along with non-U.S. companies in Fortune’s Global 500 database with revenues of more than \$10 billion.

Online *Xtra* subscription available for employees and retirees

Employee readers of *Xtra* can opt out of receiving the print version of Xcel Energy’s employee and retiree publication, and instead read the online version on XpressNet or via a portal on the company’s website at xcelenergy.com.

To complete the opt-out process, employees need to fill out a form on the *Xtra* homepage of XpressNet, providing their name, employee ID and company email address. Those who choose to opt out will receive an email when a new issue is available for online viewing.

The opt-out form and online versions of *Xtra* can be found by clicking on the “*Xtra* Online” link, located at the bottom of the XpressNet homepage. The online edition of *Xtra* also can be found at xcelenergy.com/Xtra – or from the home page, look under Community/Community Involvement/Retiree Directory.

In addition, retirees can opt out of receiving the print version, or request address changes regarding home delivery of the print edition, by calling the Human Resources Service Center at 800-689-7662. They also are invited to visit the webpage noted above (or xcelenergy.com/Retirees) to view the latest issue, as well as a number of back issues of *Xtra*.

Chippewa Falls Hydro debuts new lighting display

For the first time in 91 years, Chippewa Falls Hydro in Wisconsin is awash in color. The new LED lighting was revealed in conjunction with a “Paint the Town Red” community event last month.

Mark Stoering, president of Xcel Energy—Wisconsin and Michigan, and Greg Hoffman, mayor of

Chippewa Falls, were among the speakers at the event.

“This is another exciting event for us here in Chippewa Falls, and I think you’re going to like what you’re about to see,” Stoering told the crowd. “We appreciate the partnership with the chamber and city, and all of the hard work by our Hydro Operations team and contractors. I’m confident that the lights will be another great addition

for the community and enhancement to the park.”

The new LED lighting, which faces the Chippewa Riverfront Park, will be on display every evening from sundown until midnight. There are 12 lights mounted on top of the facility, each capable of providing multi-color displays. The colors will change throughout the year to match the seasons and holidays, or to highlight events in the community.

Prior to the lighting event, nearly 50 people took the opportunity to tour the Chippewa Falls Hydro. The 24-megawatt facility was built in 1928 on the site of the former Chippewa Lumber & Boom Co., the largest sawmill in the world under one roof.

The debut of the new LED lights follows the relighting of the facility’s historic NSP sign in December 2016, which had gone dark a few decades ago. Hydro Maintenance refurbished the sign, and it now shines brightly and efficiently with LED lights.

News Brief

Photo Op



Cloud Lines

Paul Storm, senior specialty designer with Substation Engineering Design, took this photo of a 230-kilovolt transmission line running along a bicycle trail beside the South Platte River trail, close to downtown Denver.

Editor’s Note: “Photo Op” is a standing feature in Xtra. Each issue, a photo submitted by a reader or produced by a member of Corporate Communications will be published. Please submit high-resolution digital photos to the editor at the email address listed on the back page of this publication. By submitting images for “Photo Op,” employees give Xtra permission to run the photos.

THE ASHLAND LAKEFRONT PROJECT

Innovative approaches used on
massive Lake Superior effort



After three decades of discussion and a decade of work – along with a few trials and tribulations – Xcel Energy has helped turn a Superfund site along the shores of Lake Superior into the renewed heart of Ashland, Wisconsin.

In the early 1900s, the area was home to one of the nation's busiest industrial ports. Lumber, mining, railroad and utility companies used the shoreline for operations, and later a municipal-owned dump and wastewater-treatment facility operated there.

In 2010, the U.S. Environmental Protection Agency established methods to remediate or remove impacted soils, debris, groundwater and waste wood from the area. Xcel Energy, having purchased a predecessor company that operated a manufactured gas plant in the area years before, was given the responsibility to design and complete the \$200 million-plus cleanup effort.

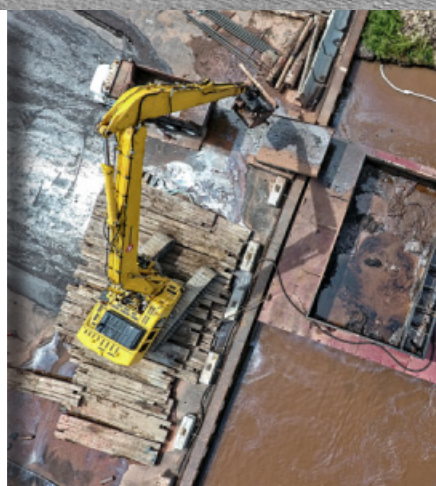
During the project, the company successfully recovered some costs from other potentially responsible parties and their insurers. However, the majority of the costs were paid by Xcel Energy natural gas customers in Wisconsin.

The massive company effort is now wrapping up thanks to the work of an internal team that employed first-of-a-kind, innovative strategies and technologies to safely complete the project. For its efforts, the team recently received the company's coveted Innovator Award.

Working closely with EPA and the Wisconsin Department of Natural Resources, the cross-functional employee team ensured that the goals of the project's "record of decision" were achieved. It developed and completed a project that was safe, environmentally sound and economically balanced, said Mark Stoering, president of Xcel Energy–Wisconsin and Michigan.

"This is a significant milestone that will allow the Ashland community to move forward with its waterfront-redevelopment plans and use the area as a valuable community asset," Stoering said. "This project required many groups to work together and develop innovative approaches to achieve success.

"Our employees and contractors met all the challenges they faced, and I commend them for a job well done," he added. "And we appreciate the community's support throughout as we addressed each phase of the project."



And now, as Paul Harvey used to say, “The rest of the story.” And it is... quite a story.

After a history of heavy industrial operations in Ashland along the shores of the world’s largest body of fresh water, a petition to name the area a Superfund site was filed by a local resident in 2005. After much discussion and planning, the cleanup project began in 2012, headed by Xcel Energy, which had no previous experience with a remediation project of this significance and magnitude.

Phase One of the effort involved large excavators working on shore to process and clean the soil, said Terry Coss, director of Environmental Services. In addition, wells were installed to treat the groundwater, which will continue operating for years to come. That was the easy part.

Phase Two operations involved working on near-shore and offshore sediments in the lake itself – in open-water marine conditions similar to an ocean environment. A dry-dredge approach initially was proposed by the EPA.

This would involve cordoning off small portions of the lake with sheet-pile walls to uncover the lake floor for the cleaning

of sediments and waste materials. These boxes of metal would then move from spot to spot, while trying to keep out a rather large amount of lake water.

“This, however, was not the company’s preferred method, due to significant safety issues, costs and the dangers it posed in terms of wall failures and other potential issues,” Coss said. “Our team worked to negotiate a change in methods. Eventually, the EPA agreed that the alternative wet-dredge process we proposed could be used, provided we could prove the method worked by first completing a pilot project.”

Unfortunately, that pilot project was halted in 2014 before dredging even began, due to a major storm with high winds and 10-foot waves that crashed into the protective barges, damaged equipment and upended operations. The solution to this problem then involved – in less than a year – designing, permitting and constructing a 1,000-foot breakwater of rock to protect the area (a significant structure that will benefit the community for years to come).

“Through this part of the effort, however, we were able to build goodwill and credibility with the EPA by showing we were





ready and able to complete the agreed-upon work," said Brian Elwood, general manager of Customer and Community Service.

With a breakwater in place, a second pilot project soon proved successful, and a comprehensive, wet-dredge effort moved ahead in 2017. The wet dredging involved using barges with excavators that could dig up the lake bottom to remove sediments and waste materials.

The materials were hauled to shore. Large pieces such as railroad ties and entire logs were hauled away, while the sediments were moved through a processing tent on shore for dewatering before being sent to a landfill.

Water in the bay, stirred up during the dredging, also was treated on an ongoing basis. Crews used multiple layers of protective curtains to separate the dredge area from the rest of the bay, and air and water monitors were used to ensure the safety of the workers, community and the environment.

The final step of the dredging involved a hydraulic dredge,

which functioned like a vacuum to sweep up any remaining residuals on the lakebed redeposited during the prior phases of the project.

"Two years of this wet dredging in essence completed the most challenging remediation portion of the project," Coss said. "And in the end, all project requirements were met or exceeded."

The effort led to the removal of more than 240,000 tons of sediment and debris, requiring more than 11,500 truckloads. And nearly 130 million gallons of water were treated and returned to the bay, with no exceedances. In addition, 480,000 hours were safely worked by contractors and employees, with only one recordable incident – a minor muscle strain.

"The ability of our team to focus on the right things for our customers and communities – and our willingness to both question and trust each other – led to the best possible results," Elwood said. "We had support from leadership and all the right

Ashland Effort

A massive company effort along the shores of Lake Superior in Ashland, Wisconsin, is now wrapping up thanks to the work of an internal team, which for its efforts recently received the company's coveted Innovator Award. The large black and white photo on pages 9, 10 and 11 is of the Ashland harbor in 1940. Other photos show various aspects and angles of the work involved to complete the project.



players on the team to help lead us to a successful result.”

The Ashland project is now of international interest, Coss said, and environmental-remediation seminars hold the project up as an example to follow. Many of the new innovative techniques used during the effort will be repeated in other applications around the world.

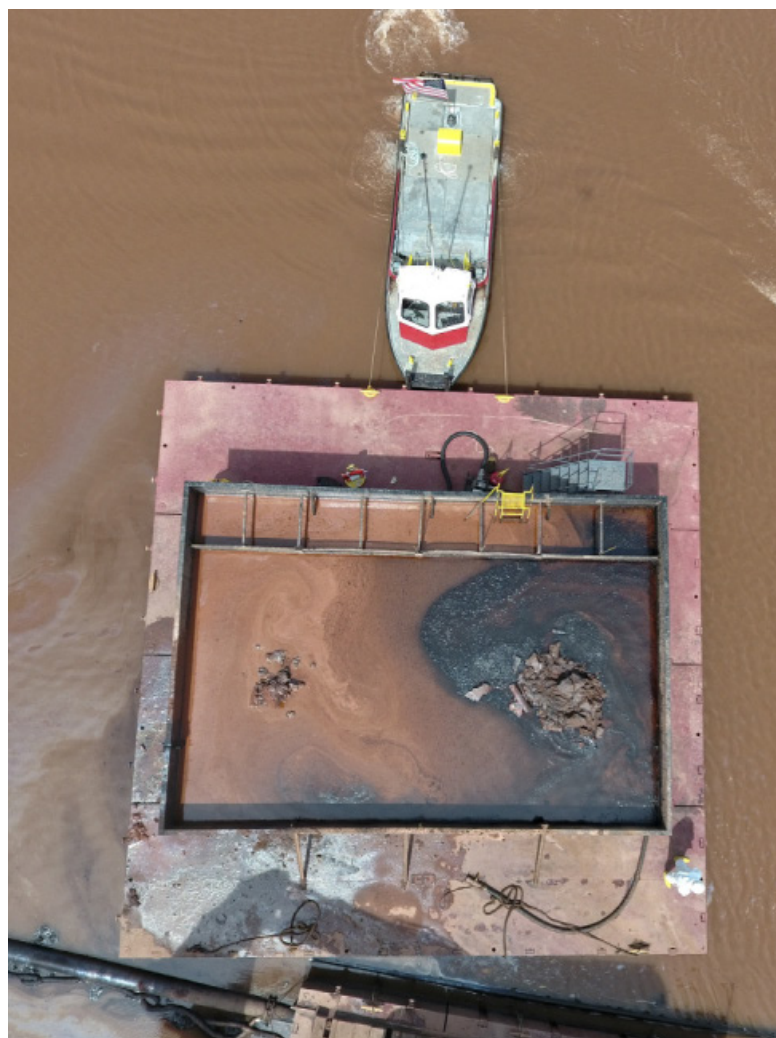
“We set out to do it right, safely and cost effectively – and it proved successful,” Coss said. “It took a long time, but could have taken a lot longer. And it cost a lot, but could have cost a lot more.”

Focusing on and serving the Ashland community also was a crucial part of the overall effort, said Mike BeBeau, community service manager and native of Ashland, who served as the local contact, as well as project manager over the past several years. The company successfully worked with neighbors, a nearby school and others to mitigate noise and odors – and the project became an economic boon for the area.

Admitting that his role proved stressful at times, BeBeau said there was plenty of back-and-forth communications with the city council, county board and other parts of the community. The company also participated in every public information meeting held for the project.

“We were always transparent and above board, and worked to minimize the cost, duration and impact to the community,” BeBeau said. “There is now a real sense of accomplishment, but I wouldn’t wish the work on anyone else in the company.

“In the end, the community respected us for our role in the project and appreciated our efforts,” he added. “It went as well or better than anyone expected. We safely and successfully completed the project for both people and the environment in a professional manner.” ←



STEPping Up

Company part of national EEI effort to support grid

The utility industry has developed a nationwide program to help maintain the reliability of the U.S. electric grid in the event of a terrorist attack that destroys large power transformers.

The Spare Transformer Equipment Program (STEP) is designed to support the transmission system by ensuring spare-transformer capacity is available – in case an affected participating company needs to restore its system following a triggering event, said Dan Fleischman, manager of Transmission System Performance.

“Following the 9/11 attacks, the electric utility industry decided to focus on additional ways to improve the resiliency of the electric grid,” he said. “Transformers were identified as one of the key vulnerable components of the grid.”

Organized by the Edison Electric Institute (EEI), the STEP program provides a way for participating companies to quickly purchase and acquire power transformers in the event of a terrorist attack, he said. It does not, however, address routine failures or events that may cause localized outages in distribution service.

The STEP contract – negotiated by more than 50 energy companies through a multi-year, consensus-building process – provides each participating company with legally-enforceable rights to access readily-available, spare-transformer capacity that has been committed to the program.

Xcel Energy has been part of the program since its beginning, said Jake Bluem, staff engineer and the company’s official STEP representative. EEI, a number of U.S. utilities and several federal government agencies began studying the various issues involved in recovering from a potential attack on the nation’s

electric grid in 2002.

Transformers were identified as a key vulnerable component of the grid, he said. The massive units can take up to 18 months to manufacture and deliver, and can cost millions of dollars apiece. In an emergency situation, where power is down and a replacement transformer is needed, this lead time is obviously unacceptable.

Two years later, EEI presented a proposal to industry leaders concerning the development of the transformer-sharing program. At the end of 2005, a binding sharing agreement was presented to the industry for approval, and STEP then became operational in 2006.

Bluem recently attended the semi-annual STEP meeting for all participating members. Utility representatives meet to discuss security issues and transportation methods, he said, including ongoing and updated obligations under the program. They also elect a new executive committee and representatives for the different transformer voltage classes used in the program.

In addition, an intensive drill is held each year during one of the meetings. It involves both security and transportation issues, he said, and tests the program’s call-out systems among participating utilities to acquire needed equipment.

For instance, if three substations have been taken out in a disaster scenario, where will the transformers come from, and how will they get there?

Each member utility selects at least one voltage class to join. Xcel Energy currently participates in two voltage classes – 345-115 kilovolt and 230-115 kilovolt – and has at least one of each type of transformer on hand and ready, if needed.



Because of broad-based industry participation in the program, its capacity is geographically dispersed across the country. And because the FERC has approved the transfers contemplated by STEP – and all participating companies have secured all required state commission approvals – no additional regulatory approvals are required to access the capacity.

Each year, participating companies' existing inventories and system needs are analyzed to determine the amount of transformer MVA that must be committed to STEP by each member, Bluem said. MVA means mega-volt amperes, and transformers are designed and cataloged by MVA ratings. A transformer's MVA rating indicates its maximum power-output capacity, and the higher the rating, the larger the transformer.

If a triggering event occurs, and the affected utility is unable to recover its system using other means, it is entitled to exercise call rights to acquire any of the spare transformers committed under the program in the relevant voltage class. Unlike a voluntary mutual-aid program, these rights are legally enforceable.

As a result, STEP provides a participating company with legal rights to access an amount of MVA that is multiple times more than the amount of MVA represented by its owned spare transformer inventory. This represents a significant increase in resiliency at a fraction of the capital cost, he said.

On average, STEP participants with the highest needs have legal rights to access approximately seven times the amount of MVA that is represented by the spare transformers that they own.

Having legal rights to access this kind of spare capacity over directly-owned transformers represents a significant improvement to system resiliency, he said. The program represents a way to greatly improve system resiliency in a manner that is cost-effective for both customers and other stakeholders.

"You hope you never have to use it," Bluem said. "But it's there if you need it." ←



Transformers

The utility industry's Spare Transformer Equipment Program is designed to support the nation's transmission system by ensuring spare-transformer capacity is available in case an affected participating company needs to restore its system following a triggering event.

COMPANY'S AMBITIOUS CARBON VISION SUPPORTED BY SCIENCE



New report outlines path to carbon reductions

Xcel Energy's vision to deliver 100 percent carbon-free electricity to customers is now backed by a scientific study.

The company recently announced that it verified its groundbreaking carbon goals in a newly published report – an industry first for in-depth analysis. It partnered with climate scientists from the University of Denver to confirm its vision is consistent with temperature goals of the Paris climate agreement.

As a national leader in clean energy, Xcel Energy is on a quest to deliver carbon-free electricity by 2050. In 2018, the company reduced carbon emissions by 38 percent from 2005 levels, as it aims to cut carbon emissions 80 percent by 2030 company-wide.

This significant progress comes as the company adds new wind and solar to its energy portfolio, while retiring coal plants and transitioning with cleaner natural gas, said Ben Fowke, chairman, president and CEO.

"We are well positioned for the future, and are focused on putting the right technology and policies in place to make our vision a reality," Fowke said. "Our 2018 carbon results demonstrate the significant gains we're making in the transition to clean energy while still maintaining safe, reliable and affordable service for our customers."

A newly published report, titled "Building a Carbon-Free Future," outlines the company's path to achieving its ambitious carbon reductions, as well as the results of the scientific study. The climate modeling experts concluded the company's emissions-reduction trajectory under its carbon vision is consistent with electric-sector emissions in scenarios likely to achieve the temperature goals of the Paris climate agreement.

In 2018, Xcel Energy cut carbon emissions an additional 3

percent in one year. This reduction is notable because according to the U.S. Energy Information Administration, carbon emissions for the overall electric power sector increased 2 percent in 2018.

Xcel Energy's lower emissions are the result of continued high performance from the company's nuclear plants, reduced coal generation and an increase in generation from natural gas and some renewables, he said. Xcel Energy's new 600-megawatt Rush Creek wind farm in Colorado also came online last year – the company's largest wind project to date.

Xcel Energy studied many pathways for achieving its goals, and its carbon report identifies key elements for reducing carbon emissions 80 percent by 2030. These elements include:

- Adding thousands of megawatts of wind and solar power to its system.
- Incorporating both natural gas generation and battery storage to help balance high levels of renewables.
- Retiring more coal units or changing coal unit operations to reduce emissions.
- Operating its nuclear plants through their licenses.
- Supporting the strategic electrification of certain end uses, such as transportation, to create flexible demand.
- Investing in critical infrastructure, such as transmission and advanced-grid technology, for the distribution system.

Beyond 2030, the company will need new 24/7 carbon-free technologies that are not yet commercially available at the cost and scale required, he said. To serve customers with 100 percent carbon-free electricity by 2050, the company is calling for more research, innovation and demonstration of advanced carbon-free technologies, such as seasonal energy storage, advanced nuclear or small modular reactors, carbon capture and storage, deep rock geothermal, or other technologies. ←

Letters

'Their positive attitude was unbelievable'

Dear Xcel Energy:

I just want to thank you for the timely response to our gas outage. Your crew was very professional and made sure the system got back up and running.

I cannot tell you enough how impressed I was with them and their service. Their positive attitude was unbelievable considering the extreme cold and long hours that I know they must have put in. Great job Xcel Energy!

—**Beverly, Roseville, Minn.**

'We were elated'

Dear Xcel Energy:

I just wanted to thank your crew who recently worked on the power outage in west Bloomington. We woke to the power going out at midnight. And we were told by text that the power was expected back on at 3:45 a.m.

Instead, the power came back on at 1:15 a.m. Huddled under our blankets with all of our clothes on in case we needed to leave the house, we were elated.

Please thank the crew who braved the minus-20 degree temperatures to fix our electric outage.

—**David, Bloomington, Minn.**

'They went above and beyond in frigid temperatures'

Dear Xcel Energy:

January 30 – the coldest day in the Twin Cities in 20 years – and our neighborhood lost gas supply. Within a reasonable time, several Xcel Energy vehicles and workers arrived.

They stayed in our neighborhood overnight to continue to ensure the issue was resolved. Our neighbors are very thankful for the dedication of this crew! They went above and beyond in frigid temperatures. Thank you!

—**Minnesota Customer**

Xcel Energy moves into new Canyon Service Center

Xcel Energy is now occupying a new and much larger service center in Canyon, Texas, to help the company better serve the high level of growth in its Canyon operations district.

"We've experienced a high rate of growth as our commercial and industrial customer base expands and new home development booms," said Mike Grant, manager for Community and Economic Development in the Canyon and Hereford area. "We can better serve our Canyon-area customers from a larger and more accessible location."

The new service center, located on close to 10 acres, is comprised of a 7,700 square-foot office building and a 14,000 square-foot warehouse, for a total floorplan of almost 22,000 square feet.

In addition to providing a comfortable work setting, the new Canyon Service Center is a model for energy-efficient construction. It is equipped with LED lighting

inside and out, a highly efficient heating and cooling system, water-saving flush valves and highly efficient plumbing fixtures.

Trees and shrubs outside are irrigated through a water-saving soaking system, and the native grass lawn is watered through water-saving sprinkler heads. Total investment in the new service center is around \$6.5 million.

Electricity first came to Canyon in 1908 when the city granted a franchise to the Canyon Power Co. Texas Utilities Co. (later known as Texas-New Mexico Utilities Co.) purchased the Canyon system in 1924.

Southwestern Public Service Co., which had its origins in Roswell, New Mexico, in 1904, purchased the Canyon system from Texas-New Mexico Utilities in 1942.

News Brief

Friends We'll Miss

Jeffrey Andreen, 76, building foreman, Facilities Operations and Maintenance, Lookout Center, Golden, Colo., died on Jan. 23, 2019. He worked for PSCo from 1965 to 2000.

People

Robert Bain, 89, meter reader thereafter, Meter Reading, Arvada Service Center, Arvada, Colo., died on Jan. 20, 2019. He worked for PSCo from 1957 to 1986.

Jeanette Bellanger, 76, receipt processor, Receipts Processing, 414 Nicollet Mall, Minneapolis, Minn., died on Jan. 10, 2019. She worked for Xcel Energy from 2008 until the time of her death.

Terry Borron, 63, senior associate, Southeast Metro Gas Operations, Vanetia Service Center, Denver, Colo., died on Jan. 15, 2019. He worked for PSCo from 1981 until 2019.

Gregory Brevig, 70, nuclear fleet assessor, Monticello Nuclear Generating Plant, Monticello, Minn., died on June 2, 2017. He worked for NSP from 1989 to 2014.

Donald Bruley, 87, warehouseman in charge, Central Stores, Wisconsin, died on Dec. 22, 2018. He worked for NSP from 1960 to 1992.

Donald Brungardt, 91, senior right of way agent, Denver, Colo., died on Dec. 25, 2018. He worked for PSCo from 1948 to 1986.

Charles Bunch, 78, storekeeper, Construction Operations, Carlsbad Service Center, Carlsbad, N.M., died on Oct. 3, 2018. He worked for SPS from 1960 to 2000.

Sheldon Carlson, 78, electric meter specialist, Meter Department, Chestnut Service Center, Minneapolis, Minn., died on Dec. 18, 2018. He worked for NSP from 1970 to 2000.

Paul Carvalho, 87, pipeline engineer, Colorado, died on Jan. 24, 2019. He worked for PSCo from 1964 to 1994.

Donald Caton, 91, senior internal auditor, Audit Services, 414 Nicollet Mall, Minneapolis, Minn., died on Jan. 26, 2019. He worked for NSP from 1953 to 1988.

James Correll, 86, regional operations manager, Southeast Region, Minnesota, died on Dec. 22, 2018. He worked for NSP from 1953 to 1990.

Carla Daniels, 71, senior field operations associate, Maple Grove Materials Complex, Maple Grove, Minn., died on Jan. 1, 2019. She worked for NSP from 1981 to 2010.

Myron Davis, 80, emergency planner, Power Supply Training, Training Center, Monticello Nuclear Generating Plant, Monticello, Minn., died on Jan. 18, 2019. He worked for NSP from 1964 to 1996.

Nancy Davison, 72, credit and collection representative, Credit Call Center, Amarillo Call Center, Amarillo, Texas, died on Dec. 30, 2018. She worked for Xcel Energy from 1986 to 2009.

Robert Doran, 83, instrument specialist, Technical Services, Sherco Plant, Becker, Minn., died on Jan. 15, 2019. He worked for NSP from 1971 to 1994.

Jerry Dustman, 82, garage working foreman, Transportation, Roswell Garage, Roswell Service Center, Roswell, N.M., died on Dec. 26, 2018. He worked for SPS from 1974 to 2000.

Gaylen Enerson, 73, instrument supervisor, King Generating Plant, Bayport, Minn., died on Jan. 21, 2019. He worked for NSP from 1968 to 2002.

Mary Engeltjes, 70, supply chain director, Nuclear Supply Chain, Marquette Plaza, Minneapolis, Minn., died on Jan. 3, 2019. She worked for NSP from 2001 to 2011.

Richard Fenlason, 89, tree trimming foreman, St. Cloud Service Center, St. Cloud, Minn., died on Jan. 11, 2019. He worked for NSP from 1951 to 1992.

Gerald Fjerstad, 76, electric meter technician, Electric Meter Shop, Rice Street Service Center, St. Paul, Minn., died on Dec. 30, 2018. He worked for NSP from 1962 to 1995.

Donald Fonda, 92, order reader thereafter, Meter Reading Department, Kipling Service Center, Lakewood, Colo., died on Jan. 12, 2019. He worked for PSCo from 1949 to 1991.

Richard Fuchs, 84, construction superintendent, Production Services, Monticello Nuclear Generating Plant, Monticello, Minn., died on Dec. 22, 2018. He worked for NSP from 1983 to 1999.

John Garvey, 92, Minneapolis, Minn., died on Jan. 1, 2019. He worked for NSP from 1951 to 1988.

Donald Gilbert, 94, working trouble foreman, Electric Distribution Operations, Colorado, died on Jan. 17, 2019. He worked for PSCo from 1952 to 1986.

Harlene Hardt, 80, Construction Operations, Valenia Service Center, Denver, Colo., died on Dec. 17, 2018. She worked for PSCo from 1969 to 1994.

David Hedstrom, 82, troubleman-repairman, Northern Electric Line, Fort Collins Customer Center, Fort Collins, Colo., died on Dec. 20, 2018. He worked for PSCo from 1963 to 1994.

Billy Henry, 90, died on Dec. 17, 2018. He worked for SPS from 1958 to 1990.

William Howie, 83, lead property accountant, Property Accounting, Headquarters Office Building, Denver, Colo., died on Jan. 5, 2019. He worked for PSCo from 1969 to 1994.

Richard Hullsiek, 88, drafting specialist, Overhead, Minnesota, died on Dec. 22, 2018. He worked for NSP from 1962 to 1988.

Wayne Jude, 77, line clearance coordinator, Tree Trimming, Paynesville District Office, Paynesville, Minn., died on Jan. 5, 2019. He worked for NSP from 1960 to 1996.

Robert Jurmu, 82, shop foreman, Meter Management and Support, Chestnut Service Center, Minneapolis, Minn., died on Jan. 19, 2019. He worked for NSP from 1956 to 1995.

Theodore Lind, 78, representative, BSC, Seventeenth St. Plaza Headquarters, Denver, Colo., died on Jan. 8, 2019. He worked for Xcel Energy from 1966 to 2001.

Jack Martin, 89, inspector trainer, Transportation, Lipan Transportation Center, Denver, Colo., died on Jan. 7, 2019. He worked for PSCo from 1958 to 1994.

Wayne McFetridge, 83, working foreman, Transportation, Kipling Service Center, Lakewood, Colo., died on Dec. 27, 2018. He worked for PSCo from 1965 to 1994.

Roger Moen, 61, lead splicer mechanic, Underground Construction, Chestnut Service Center, Minneapolis, Minn., died on Oct. 22, 2018. He worked for NSP from 1978 to 2014.

Kevin O'Keefe, 65, dispatcher, Operations, Rice Street Service Center, St. Paul, Minn., died on Jan. 22, 2019. He worked for NSP from 1974 to 2012.

Thomas Pepin, 85, senior accountant, Tax Services, Colorado, died on Dec. 17, 2018. He worked for PSCo from 1959 to 1991.

Thomas Peters, 80, gas service supervisor, Utilization, Rice Street Service Center, St. Paul, Minn., died on Aug. 13, 2018. He worked for NSP from 1960 to 1994.

Ronald Phinny, 77, environmental analyst, Environmental Waste and Remediation, SPS Tower, Amarillo, Texas, died on Dec. 6, 2018. He worked for Xcel Energy from 1964 to 2002.

Constantine Psihos, 87, trouble foreman, Overhead, Chestnut Service Center, Minneapolis, Minn., died on July 20, 2018. He worked for NSP from 1951 to 1992.

Robert Purvis, 84, district supervisor, Mesa County Operations Center, Grand Junction, Colo., died on Jan. 13, 2019. He worked for PSCo from 1953 to 1994.

Harold Reed, 80, Electric Distribution Engineering, SPS Tower, Amarillo, Texas, died on Nov. 18, 2018. He worked for Xcel Energy from 1972 to 2002.

Betty Renfandt, 87, credit collection clerk, Business Operations, Minot Office, Minot, N.D., died on Jan. 9, 2019. She worked for NSP from 1958 to 1988.

Barbara Sanford, 77, administrative assistant, Utility Engineering (UE), Amarillo, Texas, died on Dec. 13, 2018. She worked for SPS from 1990 to 2003.

Barry Schafhauser, 85, Corporate Transportation, Chestnut Service Center, Minneapolis, Minn., died on Jan. 1, 2019. He worked for NSP from 1957 to 1992.

Willie Sexton, 84, died on Jan. 26, 2019. He worked for SPS from 1963 to 1996.

Larry Thiesen, 77, overhead working foreman, North Metro Electric Operations, Arvada Service Center, Arvada, Colo., died on Dec. 26, 2018. He worked for PSCo from 1966 to 2006.

John Trebtoske, 88, utilization foreman, Gas Operations, St. Cloud Service Center, St. Cloud, Minn., died on Jan. 25, 2019. He worked for NSP from 1956 to 1992.

Dean Turnberg, 91, supervisor, Relay Maintenance, Electric Protection, Chestnut Service Center, Minneapolis, Minn., died on Dec. 20, 2018. He worked for NSP from 1947 to 1988.

James Ulrich, 80, line crew foreman, Overhead Construction, Chestnut Service Center, Minneapolis, Minn., died on Jan. 24, 2019. He worked for NSP from 1962 to 2000.

Maryann Wagner, 69, field operations supervisor, North Metro Electric Operations, Arvada Service Center, Arvada, Colo., died on Jan. 26, 2019. She worked for PSCo from 1978 to 2015.

Theodore Wall, 90, switchboard wireman, General Office Division, Minnesota, died on Dec. 31, 2018. He worked for NSP from 1948 to 1983.

Thomas Williams, 85, lineman, Metro West Electric Service, Minnesota, died on Dec. 18, 2018. He worked for NSP from 1956 to 1995.

Buford Yarbrough, 87, service scheduler, Building Management Services, Headquarters Office Building, Denver, Colo., died on Dec. 31, 2018. He worked for PSCo from 1958 to 1994.

Retiring

Wayne Bauer, instrument and control specialist, Technical Services, Sherco Generating Plant, Becker, Minn., retired on March 1, 2019. He worked for Xcel Energy for 32 years.

Emerson Blunt, senior process controls analyst, Plant Engineering, Sherco Plant, Becker, Minn., retired on March 22, 2019. He worked for Xcel Energy for 31 years.

Beverly Brown (beverly.brown99@gmail.com), director, Diversity and Inclusion, 1800 Larimer, Denver, Colo., retired on March 18, 2019. She worked for Xcel Energy for 41 years.

Bob Cochran, operating engineer, Transmission Operations-South, Transmission Control Center, Amarillo, Texas, retired on March 1, 2019. He worked for Xcel Energy for 40 years.

Bradley DeLaBarre (toolman@ecentral.com), designer, Design, Valentia Service Center, Denver, Colo., retired on Feb. 19, 2019. He worked for Xcel Energy for 39 years.

Wayne Eppen (weppen@comcast.net), shift manager, Operations, Prairie Island Nuclear Generating Plant, retired on Dec. 14, 2018. He worked for Xcel Energy for 40 years.

Colleen Estrada, rate information supervisor, Regulatory Administration, Denver, Colo., retired on Feb. 28, 2019. She worked for Xcel Energy for 30 years.

Verle Eyer (v.eyer@yahoo.com), journeyman mechanic, Maintenance, Harrington Station, Amarillo, Texas, retired on Feb. 21, 2019. He worked for Xcel Energy for 40 years.

Kenny Francis (kennyandmarge@gmail.com), senior system chemist, Chemistry Resources, System Lab, Amarillo, Texas, retired on Feb. 15, 2019. He worked for Xcel Energy for 38 years.

Kenny Getz, overhead working foreman, Electric Line, Fort Collins, Colo., retired on Jan. 4, 2019. He worked for Xcel Energy for 39 years.

Robert Lee Goulet, foreman, Substation Construction, retired on Feb. 22, 2019. He worked for Xcel Energy for 32 years.

John Gurney (jgurney57@gmail.com), mechanical maintenance resource supervisor, Mechanical Maintenance, Monticello Nuclear Generating Plant, Monticello, Minn., retired on Feb. 1, 2019. He worked for Xcel Energy for 35 years.

Gary Hedlund (gthed4@gmail.com), material and procurement specialist, Warehouse and Stockroom, Sherco Generating Plant, Becker, Minn., retired on March 29, 2019. He worked for Xcel Energy for 32 years.

Greg Hood, lead welder, Gas Department, Boulder Service Center, Boulder, Colo., retired on March 29, 2019. He worked for Xcel Energy for 36 years.

Ann Kechter (jaam6878@aol.com), balancing authority operator, Transmission, Lookout Center, Golden, Colo., retired on Feb. 7, 2019. She worked for Xcel Energy for 23 years.

Keith LaRue (keithlarue@alumni.utexas.net), technical supervisor, Distribution Design, Southwest Service Center, Amarillo, Texas, retired on Feb. 28, 2019. He worked for Xcel Energy for 41 years.

Bruce LeBlanc (brewski1@charter.net), APEO Operations, Sherco Plant, Becker, Minn., retired on Feb. 26, 2019. He worked for Xcel Energy for 32 years.

Phil Lindberg, manager, Site Routine Projects, Project Management Office, Prairie Island Nuclear Generating Plant, Welch, Minn., retired on March 29, 2019. He worked for Xcel Energy for 38 years.

Randy Linnen, plant planner, Maintenance, Comanche Station, Pueblo, Colo., retired on Aug. 2, 2017. He worked for Xcel Energy for 36 years.

David Mason, senior service fitter, Operations, Boulder Service Center, Boulder, Colo., retired on March 8, 2019. He worked for Xcel Energy for 37 years.

Joe Massey, overhead working foreman, Electric Construction, Mesa County Operations Center, Grand Junction, Colo., retired on Feb. 8, 2019. He worked for Xcel Energy for 37 years.

Richard Mauldin, lineman journeyman, Line Department, Roswell, N.M., retired on Jan. 31, 2019. He worked for Xcel Energy for 36 years.

Janice Moser, consultant, Retirement Benefit Programs, Human Resources, 1800 Larimer, Denver, Colo., retired on March 29, 2019. She worked for Xcel Energy for 20 years.

Richard Pearson (richdianepearson@comcast.net), engineering supervisor, Design Engineering, Prairie Island Nuclear Generating Plant, retired on Jan. 15, 2019. He worked for Xcel Energy for 43 years.

Thomas Thode, operations manager, Denver Underground, Lipan Distribution Center, Denver, Colo., retired on April 5, 2019. He worked for Xcel Energy for 40 years.

Jo Dell Tigrett (j.tigrett@sudenlink.com), commercial credit specialist, Customer Care Center, Amarillo, Texas, retired on Feb. 1, 2019. She worked for Xcel Energy for 37 years.

Daniel Trujillo, lead telecommunications technician, Business Systems, Roswell Service Center, Roswell, N.M., retired on Feb. 15, 2019. He worked for Xcel Energy for 43 years.

Debra Werle (dmwerle@gmail.com), warehouseman in charge, Logistics, Winona Service Center, Winona, Minn., retired on March 1, 2019. She worked for Xcel Energy for 35 years.

Scott Whitson (whitson1978@msn.com), simulation software engineer, Nuclear Training, Training Center, Prairie Island Nuclear Generating Plant, Welch, Minn., retired on April 1, 2019. He worked for Xcel Energy for 39 years.

Stephen Wilkins (wilkins2006@comcast.net), senior specialist thereafter, Corrosion Control, Gas Technical Services, Denver, Colo., retired on Jan. 31, 2019. He worked for Xcel Energy for 27 years.

Laura Wing (lazwing@comcast.net), assistant, General Counsel, Denver, Colo., retired on Feb. 15, 2019. She worked for Xcel Energy for 21 years.

William Zawacki (wpz110@charter.net), director, Regional Generation, Western Avenue Service Center, Eau Claire, Wis., retired on March 4, 2019. He worked for Xcel Energy for 33 years.

XTRA

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