MISSION POSSIBLE
Unmanned aircraft systems taking off at Xcel Energy
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On the Cover: Xcel Energy continues to push into the world of drones, or Unmanned Aircraft Systems. One “proof of concept” mission, pictured here in a photo taken by Troy Foos, recently took place in Amarillo, Texas. For more information, please see page eight.
Military veteran recruiting pays off

(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.)

You’ve all heard me talk about our workforce transition and how hiring military veterans is the right move for Xcel Energy. We know that our vets bring all the right stuff to the job: leadership, teamwork and dedication.

Last year, we exceeded our annual military veteran hiring goal for external hires – hiring three percent more veterans than we did in 2014. And in the first quarter of 2016, Xcel Energy hired 35 veterans – 15 percent of all new hires.

One veteran who will count in the second quarter numbers is our new CFO Bob Frenzel, who served in the U.S. Navy for six years.

Our efforts are getting noticed, and CivilianJobs.com recently named Xcel Energy a 2016 “Most Valuable Employer for Military” for the fourth time. Earlier this year, Military Times ranked us for the third time as one of the best places in the country for military members to work.

But it’s not about the recognition, and it’s not enough just to hire veterans. We need to make sure we provide the resources and support they need to be successful.

That’s why we work with all branches of the military on ways to help our vets successfully transition from military service to the civilian workforce. Last year, we launched Value of a Veteran, a computer-based training program to help recruiters and hiring managers better understand how military skills and experience translate to critical Xcel Energy career opportunities.

“Last year, we exceeded our annual military veteran hiring goal for external hires – hiring three percent more veterans than we did in 2014.”

Xcel Energy now employs nearly 1,000 veterans – or just over eight percent of our workforce – from all branches of service. I encourage our hiring managers to consider the skills our vets bring to the job when looking to fill openings on their teams. You won’t regret it.

And thank you to all our veterans for their service to our country and their ongoing service to Xcel Energy.
The theme “The Right Mix” illustrates the balance Xcel Energy needs to succeed in all aspects of its business.

At the company’s annual meeting, held May 18 in Eau Claire, Wis., Ben Fowke presented the company’s vision of a right mix to a gathering of shareholders, leaders and regional stakeholders.

“Whether blending renewables and traditional fuel sources within our energy portfolio, managing customer costs while ensuring quality service, advocating for regulatory frameworks to better meet customer and community needs, or attracting the best talent to move our enterprise forward, we are constantly striving for ‘The Right Mix’ to power the lives of our customers and our communities,” said Fowke, chairman, president and CEO.

The first step to achieving that mix is solid financial results, he said, adding that he is proud of the strong and consistent financial performance the company has achieved.

“Compared to our peers, we delivered great value in 2015 – producing the fourth-highest total shareholder return among our peer group at 3.8 percent in a year when the average performance of our peer group was negative,” Fowke said. “Our five-year total shareholder return is an impressive 85 percent, compared with 71 percent for the EEI utility index.”

Last year also marked the 11th consecutive year Xcel Energy has met or exceeded its earnings guidance. Since 2005, the company has achieved annual ongoing earnings growth of 6.2 percent, he said, and has now increased the dividend for a 12th consecutive year.

Building from those financial results, the company is working to create The Right Mix in all areas of its operations. Those include:

- Decarbonizing the energy supply while keeping prices affordable.
- Strengthening the grid with new investments and technologies while enhancing security.
- Further earning the trust and loyalty of customers to be prepared for a more competitive energy future.
- And transitioning the workforce as more employees retire and new or different skills are required.

Fowke then highlighted a number of 2015 accomplishments in these areas, starting with the company’s continued strides in making its energy mix cleaner while keeping prices affordable.

“We completed projects that replaced or repowered aging coal plants with natural gas, such as our Colorado Clean Air/Clean Jobs program, and we are proposing a transition from coal in the Upper Midwest through our resource plan,” he said. “We invested to keep our nuclear operations strong for another 20 years.

“We also developed new solar projects, both large scale to serve all customers and community projects for customer subscription,” he said. “And we significantly increased the amount of wind energy on our system, including several new wind farms that we own and operate.”

The time is right for Xcel Energy to continue down this path, he added, as low natural gas prices allow it to continue to transition away from coal. That, combined with low-cost renewables, is allowing the company to achieve an even cleaner energy mix.

“Our thoughtful, proactive approach is getting noticed,”
Fowke told shareholders. “The Environmental Protection Agency in March presented us with a Climate Leadership Award for reducing carbon dioxide emissions by 20 percent from 2005 to 2014. That’s six years ahead of schedule. And our bold plans for the future in both the Upper Midwest and Colorado will keep us on the forefront of environmental leadership while delivering affordable energy.”

The Right Mix of energy also requires a strong and resilient grid to deliver it to customers, and the company is making sizable investments to provide it, he said. For instance, more than 700 miles of new lines went into service during 2015.

“Now, all of the above helps us to better serve our customers – but it is not enough,” Fowke explained. “We need to excel in operations, offer valuable options and convenience, and provide expert advice to help our customers achieve their goals. And nowhere is our customer commitment more clear than our storm response. Frankly, no one in the industry does it better.”

In December, for example, severe storms in Texas and New Mexico caused widespread outages. Despite the extreme and dangerous weather, dedicated company employees delivered, he said. “They safely restored power to 84 percent of customers within 12 hours, and to 98 percent of customers within 24 hours,” he said. “We had a similar strong response in Colorado in March of this year following the worst blizzard to hit the state in a decade. I’m proud of how our employees step up and selflessly serve our customers when they need us the most.”

“Clean energy, a resilient grid, excellent operations – all at an affordable price,” Fowke said in wrapping up his remarks. “Sounds like ‘The Right Mix’ to me. And one that will keep delivering value for you.”

In recent years, Xcel Energy has taken its annual meeting on the road to various sites. Previous meetings have been held across the company’s service territory, including Minneapolis, Denver, Amarillo, Fargo and Sioux Falls.

In addition to the annual meeting, Fowke and other Xcel Energy leaders spent time with employees, community organizations and business leaders while in the Eau Claire area.

The day prior to the meeting, Fowke and Mark Stoering, president of Xcel Energy – Wisconsin and Michigan, hosted employee meetings at the company’s Western Avenue and Sky Park facilities in Eau Claire. The meetings included a brief overview of the annual meeting, an update on key projects and an opportunity to ask questions.

Fowke and Stoering also presented a check for $175,000 to the United Way of the Greater Chippewa Valley. Joining Fowke and Stoering for a check presentation were 2015 United Way employee co-chairs in Wisconsin, Andie Auna with Customer Care and Kyle Neidermire in Transmission.

And while in nearby Chippewa Falls, Fowke and Stoering toured the Jacob Leinenkugel Brewing Co. with Dick Leinenkugel himself, a fifth-generation owner of the seventh-oldest operating brewery in the country. Founded in 1867, Leinenkugels is one of Xcel Energy’s largest business customers in Chippewa Falls.

“The tour just reinforced the importance of the work we do,” Stoering said. “And how businesses rely on us to power their operations and keep commerce moving forward.”
Xcel Energy is moving forward with development of Wisconsin’s largest community solar garden program. As part of Solar*Connect Community, the company will purchase the electricity produced by a pair of one-megawatt solar gardens. One will be built in the city of Eau Claire and the other in La Crosse County. The solar gardens will be constructed by Pristine Sun, a San Francisco-based leading developer of solar projects.

The city of Eau Claire recently signed a lease with Pristine Sun to build the Eau Claire solar array on 7.5 acres of an abandoned landfill near the company’s Wisconsin headquarters at the Sky Park Industrial Park. The landfill operated as a municipal waste facility from 1948 to 1965.

“Solar is an excellent reuse strategy for this idle landfill, and the project is another great example of how the private and public sectors can work together for economic development, and in this case, provide a clean energy solution to the public,” said Dale Peters, Eau Claire city manager.

Xcel Energy received a strong showing of customer interest since beginning to offer Solar*Connect Community subscriptions in late February and expects the program to be substantially subscribed by the end of the year.

“We are pleased to offer an option for customers who want to support locally sourced solar power, and to collaborate with the city of Eau Claire on a prime location for one of our first community solar gardens,” said Mark Stoering, president of Xcel Energy – Wisconsin and Michigan. “Securing this very visible location is an exciting step in the process, and we look forward to breaking ground later this year.”

With community solar programs, customers share in the benefits of solar energy without the need to install solar panels on their own roofs or maintain their own solar arrays. Through Solar*Connect Community, customers choose their own subscription level, pay a one-time fee to subscribe and receive a monthly credit on their electric bill based on their portion of the solar energy produced.

In addition to the solar garden in Eau Claire, Pristine Sun will construct a similar-sized facility on private land in La Crosse County. Xcel Energy also may opt to build up to one megawatt of additional community solar that could be operational in 2017.

The two community solar gardens are expected to be operational by the end of 2016.

“We are enthusiastic that Xcel Energy is developing solar gardens in western and northern Wisconsin,” says Jeff Rich, executive director of GL Envision-Gundersen Health System. “The goal of providing clean, carbon-free electricity in local communities is commendable.”

Initially after the program’s announcement, Xcel Energy worked with the Midwest Renewable Energy Association to host numerous town-hall-style meetings throughout western and northern Wisconsin. At these “Solar Power Hours,” customers learned more about the benefits of community solar and were able to sign up for subscriptions.

“Since 1990, the association has worked to educate and demonstrate the benefits of solar power, and we were excited to partner with Xcel Energy to promote the Solar*Connect Community program,” said Doug Single, the association’s development director. “The program will offer affordable solar-power options to all electricity customers in the service area, and we look forward to working with Xcel Energy to grow solar in Wisconsin.”

Solar*Connect Community
Company receives strong showing of interest in Wisconsin
Company achieves top-quartile safety performance

Xcel Energy achieved top-quartile safety performance in 2015, according to the Edison Electric Institute (EEI). The Safety department recently completed validation of the company’s 2015 OSHA recordable incident rate of 0.90 (the number of employees per 100 full-time employees that have been involved in a recordable injury or illness). That result placed Xcel Energy in EEI’s top quartile (top 25 percent of U.S. investor-owned electric and nuclear companies) for 2015 safety performance.

“Achieving EEI top quartile performance is a tremendous accomplishment for our entire company,” said Ben Fowke, chairman, president and CEO. “It confirms Xcel Energy’s status as a top safety performer among peer utilities. This wouldn’t be possible without our employees’ commitment to work safely and ensure we all go home injury-free every day.”

EEI is the association that represents all U.S. investor-owned electric companies. Established in 1933, the organization provides public policy leadership, strategic business intelligence, and conferences and forums.

Xcel Energy finished 2015 with its eighth straight best year ever for safety, as 12 fewer employees went home injured compared to 2014. The company’s OSHA Recordable Incident Rate has steadily dropped every year since 2008, when 279 employees were injured. In 2015, there were 111 employee injuries, meaning 700 fewer employees went home hurt these past eight years.

“Safety has certainly become a value for Xcel Energy employees,” added Gary Lakey, vice president of Safety and Workforce Relations. “It’s nice to be recognized at the industry level for working safely. We’re off to a tremendous start for safety in 2016 and on target to achieve top quartile for the second consecutive year.”

Over the past eight years, Xcel Energy has implemented a series of programs to keep the focus on overall safety, as well as personal safety responsibility at work and at home. They include: Safety Leadership Training Program, 24/7 Safety, Ergonomic Safety, Rules to Live By, Safety Intervention and Stop Work Responsibility, Managing Safety Performance, and the Work Injury Helpline.

Xcel Energy named among Fortune magazine’s ‘World’s Most Admired’

For the second consecutive year, Xcel Energy has been listed on Fortune’s “World’s Most Admired Companies” list, ranking among the top five in Utilities: Gas and Electric.

To establish each year’s list, Fortune partners with Korn Ferry Hay Group to ask executives, directors and analysts to rank companies in their industry, using nine distinct criteria.

This year, Xcel Energy ranked highest in social responsibility, followed by use of corporate assets, people management, innovation and financial soundness.

“I’m proud of the reputation we’ve built as an energy-industry leader, and it’s an honor to be recognized among some of the most successful companies in the world,” said Ben Fowke, chairman, president and CEO. “The World’s Most Admired Companies rankings validate our strengths and highlight clear opportunities for us to continue on our path to become a more competitive and customer-focused organization.”

Prager named to Executive Team

Frank Prager, vice president of Policy and Federal Affairs, is now reporting directly to Ben Fowke, chairman, president and CEO.

“Frank and his team are responsible for advancing Xcel Energy’s public policy and ensuring the company’s positions create value for the corporation, our customers and our many stakeholders,” Fowke said. “With a rapidly evolving policy environment on the federal level, I believe it is important to have this role on the Executive Team and as an advisor to me.”

The Emerging Technology Team now under Prager has moved to Corporate Strategy and Planning, under Emily Ahachich.

Understanding and responding to new technologies is an important part of the company’s strategy, and this realignment will further strengthen this tie, he said. The rest of Prager’s current team will remain unchanged.

“Frank has been with Xcel Energy for almost 21 years and has vast experience that will serve the company well in his new role,” Fowke said. “Previously, he was Xcel Energy’s vice president of Strategy and Policy. He also served as vice president of Environmental Policy and Services where he was responsible for the company’s environmental compliance and policy.”

Company receives strong showing of interest in Wisconsin
Xcel Energy continues to push into world of drones, or Unmanned Aircraft Systems (UAS), as part of its ongoing pursuit of cost savings and operational excellence — both key elements of the company’s Strategic Call to Action.

In fact, a team in Texas recently completed the company’s first “beyond line of sight” mission. In doing so, Xcel Energy became the first utility in the United States to receive approval from the U.S. Federal Aviation Administration and perform a beyond-line-of-sight flight.

In another move toward the technology, the company recently announced the formation of a UAS Program Office, with Eileen Lockhart now heading up the effort. Early uses of the technology indicate a significant business value, said Michael Lamb, vice president of Operating Services, and the office is looking to work with the various business units to grow UAS missions and capture maximum efficiency gains.

“Eileen has been involved with the development of this initiative, which began in 2013, and has played an instrumental role with moving the UAS program forward,” Lamb said. “She has acted as the interim program manager and has led a cross-functional, enterprise-wide UAS team since 2014.”

In her role as program lead, Lockhart is working to develop company UAS procedures, contracts, budgets, business cases, best practices, training certifications and strategic plans, he
said. She is now working with each business unit to validate and formalize UAS team membership and goals.

“UAS ‘proof of concept’ missions over the past 18 months have clearly demonstrated opportunities for significant productivity improvements, as well as a reduction in hazardous conditions,” Lockhart said. “This rapidly evolving technology has the potential to materially change inspection and maintenance processes. We look forward to making UAS missions a more regular part of our day-to-day business.”

The UAS program will evolve over time, she said, growing the number of missions performed at a pace that makes sense for the company.

“We want to be prepared and remain an industry leader for the ongoing evolution of this technology, as more and more use cases are being developed,” Lockhart said. “We want to enable our business areas to fly as far and as fast as possible in pursuit of efficiency gains.”

Next up for a new type of UAS mission is a “post-storm assessment” test mission in North Dakota. Xcel Energy and several partners, including the University of North Dakota, the Center for Innovation, Elbit Systems of America and General Electric, have joined together and applied for a state grant to complete the mission, and presented findings to the state utility commission in June.
Previously, proof-of-concept missions have been undertaken involving numerous company facilities, including substations, transmission lines, gas pipelines, ash piles, wind turbines and various indoor locations at power plants (see related article on the following page).

For the Texas flight, the UAS team flew and inspected 20 miles of a 69-kilovolt transmission line northwest of Amarillo, said Brian Long, manager of Transmission Line Performance. “Safety is one reason we are interested in his technology,” he said. “People are safer on the ground than in the air, and a UAS offers the advantage of an aerial perspective controlled from the ground.”

Another potential advantage is reduced cost and efficiency over a helicopter or fixed-wing aircraft. While UAS technology may not totally replace other inspection methods, it could be an important part of the mix, Long said.

Yet another benefit is the opportunity to make significant improvements in data quality and gathering — requiring a close partnership with Business Systems.

“As a team responsible for transmission line reliability and performance, we’re interested in acquiring the most useful data in the most effective ways possible,” he said. “And from a competitive business perspective, UASs offer the potential to reduce costs, work more efficiently, and improve the health and performance of our assets.”

In Minnesota, a recent mission was conducted at the company’s Grand Meadow wind facility in the southern part of the state. During the mission, a UAS was used to inspect the condition of wind turbine blades, lightning protection systems and protective gel-coat paint.

“We flew along the blades, covering three angles per blade, looking for leading-edge corrosion and cracking of the coating,” said Tony Mallizzio, engineer and mission lead. “The only other way to effectively do this is to have someone roped up and hanging by the blades — and we don’t like to do that. But completing inspections are worthwhile, and this technology will prove useful in the wind power world.”

For the natural gas side of the business, recent missions focused on pipeline inspections that are typically difficult for employees to reach due to access or safety concerns, Lockhart said. The missions performed included inspection of exposed distribution gas pipeline on an abandoned bridge crossing over a river in Western Colorado and an inspection of an exposed section of a high-pressure gas pipeline in Southwest Colorado.

The UAS was used to evaluate vegetation encroachment, erosion around the exposed pipe and the condition of the pipe. A gas leak detection sensor was mounted to the UAS, to determine if the sensor could pick up a simulated gas leak. The UAS performed well on all counts, she said.

“We believe leveraging UAS technology will improve employee and public safety, and will enhance productivity and system reliability,” Lockhart said. “And the number of possible uses for UAS technology just keeps expanding.”

“Proof of Concept’ Flights

On pages eight and nine, and above left, a team in Texas recently completed the company’s first “beyond line of sight” mission, making Xcel Energy the first utility in the United States to receive approval from the U.S. Federal Aviation Administration and perform a beyond-line-of-sight flight. Above right, a UAS in flight inspecting a Grand Meadow wind turbine in Minnesota, and at top, a UAS used for various types of work.
Although Energy Supply launched the use of drones, or unmanned aircraft systems (UAS), in boiler inspections almost two years ago, it has since completed a variety of different missions across the fleet—such as flying in heat-recovery steam generators, scrubber modules and other components.

UAS even has been used to find components stacked high in a plant warehouse. And that could be just scratching the surface for applications, said Scott Wambeke, principal engineer. Technical Resources and Compliance group has acquired drones for all three of Energy Supply’s regions. And guidelines and training have been established to foster safe and effective use of UAS indoors to support plant operations.

The price of a small drone—about $1,000—versus the cost of erecting scaffolding to conduct a boiler inspection is economical, Wambeke said. And the results from quickly obtained video capture of equipment have yielded further savings.

For example, at Sherco Generating Station in Becker, Minn., a series of short flights to inspect the Unit Two burners resulted in a decrease in the number of burner parts that needed to be ordered.

Flying indoors is a lot different than flying out in the open, Wambeke noted, so the Technical Resources group also has developed training to assist indoor drone navigators and handlers. It’s not just the tight quarters and limited line of sight that present a challenge, he said, but flying inside thousands of pounds of steel tends to affect drone instrumentation.

Those affects can include the gyroscope that stabilizes the device and compass that guides its flight. Air drafts inside plant components also can affect flight.

“In a boiler, there is no autopilot, so the operator has to be in control at all times,” Wambeke said. “And since operators sometimes don’t have direct line of site they frequently have to fly from the camera screen. Flying drones sounds like a lot of fun, but it really can be rather stressful at times.”

Because Energy Supply is on the ground floor of indoor UAS technology, Technical Resources employees largely have had to develop their own operating guidelines and training program because there are no best practices in place yet in the industry, he said.

Other innovation also is occurring in the evolution of the technology. For example, the indoor UAS team has developed a few different styles of cages and propeller guards to enable flights close to objects and help prevent crashes.

The team recently purchased a 3-D printer to create UAS cages and other parts. Tom Stegge, an engineering intern at Minnesota’s Black Dog Generating Station, produces parts from the printer and has designed a cage intended to be maneuvered against a wall and then rolled up the side of a wall for stack or boiler water wall inspections.

Stegge first was exposed to UAS technology in a class at the University of Wisconsin-Eau Claire in a geography mapping project. He embraced the technology and is considering developing an indoor drone navigation system for his senior engineering project, now at the University of Minnesota. He even races drones.

“I didn’t think I would be working with drones here at Xcel Energy, but it has worked out well,” Stegge said. “We are continually experimenting with new part designs and prototypes with the 3-D printer.”
Understanding what customers value helps drives Xcel Energy’s “Compete for Customers” strategy – a key element of the Four Pillar Plan for delivering on the Strategic Call to Action.

One component of that strategy is using key customer insights to develop new products and services. Gauging customer interest and potential participation through the use of those customer insights is an important first step when considering the launch of new offerings. And products and services also must be thoroughly tested to ensure their effectiveness, practicality and durability.

To that end, a new team has been created to streamline those critical processes while ensuring operational efficiency, said Dan Nygaard, vice president of Customer Solutions. The Product Strategy and Development Pilot team formed last September as part of the Customer Solutions reorganization.

“We know what our customers want and must use that insight to build products and loyalty,” Nygaard said. “One priority we are focused on is delivering choices that our customers value, and this team plays a big role in that.”

The new team is charged with exploring new technologies that offer customers new ways to save energy, and determining customer interest in new products and services, said Colin Lamb, team lead of the Product Strategy and Development Pilot team.

Through carefully designed pilot programs, the team thoroughly tests and markets new energy-efficiency and customer-choice options for Xcel Energy customers, often working hand-in-hand with third-party partners.

“Pilot programs tend to have research questions that we need answered before we take the program to a broader customer base,” Lamb explained. “Technology testing, customer and stakeholder interest, and business-model and regulatory questions could all be reasons for a new program to go through our pilot process.

“The benefit is having a team focused on starting up new products and letting the development team continue its early-stage development work,” he added, “while also not burdening the product management team with something that may not ultimately deploy to a full program.”

The team is looking at new customer-facing programs to provide choices to customers for managing their energy use. For example, Customer Solutions is partnering with several national retailers as part of the U.S. Environmental Protection Agency’s Energy Star retail products platform.

This initiative is important because retailers don’t always promote the most energy-efficient products and services for a number of reasons, Lamb said. Promoting efficient products might add complexity or cost to retail operations. And for some products, cost-effective consumer incentives such as rebates may not influence purchasing behavior.

In Colorado and Minnesota, for instance, Best Buy, Home Depot and Sears are partnering with Xcel Energy for this innovative approach to energy efficient product adoption.

Another innovative pilot – the Multi-Family Building Efficiency program – is exploring ways to offer a streamlined...
approach to tapping energy savings for multi-unit buildings. The program starts with an extensive, whole-building energy audit to look for energy-saving possibilities, he said, including the use of LED lighting in common areas and exit signs, faucet aerators, showerheads and other energy-efficient improvements.

If needed, consulting support for improvements that require retrofitting, engineering or new equipment is also available under the program. Building owners receive a detailed assessment of potential savings in energy use before making any improvements, and they enjoy the convenience of a single point of contact to keep things simple.

Other Xcel Energy programs currently in the pilot process include residential smart thermostats in Colorado, Minnesota and New Mexico, and Energy Information Systems software to help large commercial and industrial customers identify opportunities for efficiencies.

Lamb is pleased with the progress made since the team was formed.

“Things are going well, especially considering we are testing a lot of new ideas,” he said. “We are constantly challenged because we are standing up new processes internally, along with vendors and customers. We tend to encounter technical challenges most often,” he added. “But there have been many everyday successes, as well, like those that help the pilot projects run more efficiently, meet customer needs in new and different ways, and prove out proposed technology fixes.”

One notable success has been the creation of the Xcel Energy Store, which is now offering instant rebates to customers who buy new technologies such as smart thermostats. The new thermostats allow customers to control system settings like temperature, scheduling and other key functions from their computer, tablet or smartphone.

All smart thermostats in the company store (see xcelenergystore.com) are eligible for the company’s $50 instant rebate. The offer is available to Xcel Energy residential customers with gas and electric accounts and central air conditioning in Colorado, and residential electric customers with central air conditioning in Minnesota.

“The Xcel Energy store is the primary channel for customers to enroll in the residential smart thermostat pilots, with no paperwork to fill out or mail in, and no need to wait for a rebate check,” Lamb said. “We will continue testing and monitoring energy-saving benefits, customer use and potential load management with the new thermostats.”

Already there has been a great deal of customer interest in the thermostat rebate program, he added, and the team is now shifting efforts to test demand-response opportunities for this summer’s cooling season. In addition, a small business smart-thermostat pilot is under way to evaluate the use of the products in small commercial settings.

“All of these current and future programs that our team is testing and implementing are helping customers use energy more efficiently,” Lamb said. “That not only helps them spend less to meet their energy needs, but also reduces the environmental impacts of energy use.”

Product Strategy
A new team in Customer Solutions is exploring new technologies that offer customers new ways to save energy, and determining customer interest in new products and services. Included in the effort are smart thermostat programs and (above) the Panasonic-Peña Station micro-grid demonstration project involving battery storage.
A new pilot program is using software that helps save money for large commercial customers – allowing them to evaluate, manage and reduce their energy use.

The software, called Predictive Energy Optimization (PEO), works alongside a facility’s existing building management system to control HVAC temperature and airflow. The software automatically runs daily analytics based upon occupant comfort, building characteristics, historical data, weather forecasts and utility signals to predict daily load usage.

The software can then make real-time changes in order to reduce energy use when load demand is high, allowing Xcel Energy to avoid needing to purchase or produce additional power. During periods of high demand, participating buildings may be called upon by the company to assist in system load relief, said Anne Kraft, pilot program manager with Customer Solutions.

“This energy-efficiency and demand-response product could prove to be a valuable addition to our successful Demand-Side Management portfolio,” she said. “This platform offers a unique way to combine energy efficiency and demand response in one package.”

The software was developed by energy-management software company, BuildingIQ. It can be installed quickly and seamlessly to optimize a building’s existing infrastructure, and create a 10 to 25 percent reduction in HVAC energy use, said Michael Nark, CEO of BuildingIQ.

“Our platform combines energy efficiency with demand response into one solution,” Nark said. “Buildings with our technology will benefit from daily reductions in operating costs, as well as the ability to participate in demand-response events automatically, allowing customers to take control of their energy costs and reduce environmental impact.”

The BuildingIQ software is compatible with a variety of building management systems, which is one of the reasons why Xcel Energy selected the vendor for the pilot program, Kraft said, increasing the opportunity for qualified commercial customers to participate.

The pilot, started last August in the Colorado market, is targeting approximately 2.5 million square feet of large commercial office space, and customers with an average summer peak load of 500 kilowatt hours or more. Commercial customers who participate receive the software subscription at 25 percent of full cost for the duration of the two-year pilot.

“The hope is that the energy savings the customer sees will fully cover this cost and result in additional savings beyond that cost,” Kraft said. “And we’ll pay the remaining 75 percent of the software subscription cost for the duration of the pilot.”

The pilot is designed to determine whether the software can benefit both customers and the company via energy-efficiency cost savings and load relief, respectively. Several questions will be answered as part of this effort, she said, including:

- What level of demand response does the technology deliver?
- Can this demand response be reliably and repeatedly deployed?
- Can the software be used for short-notice events?
- What level of energy savings can be attributed to optimization software?
- And is the value of energy savings sufficient for customers to subscribe to the software?

Xcel Energy would like to achieve 500 kilowatts of demand response on a peak day through the pilot. If the technology proves to be beneficial to customers as a cost-effective method to drive energy savings and demand response, Kraft said the company may transition the pilot into an ongoing rebate program for this type of “Software-as-a-Service” through its Demand Side Management portfolio.
Xcel Energy's commitment to clean energy is benefiting customers and the environment in the communities it serves, and information related to that commitment is featured in the company's annual Corporate Responsibility Report (CRR).

By adding wind and solar power, retiring aging coal plants and expanding energy efficiency programs, the company has significantly reduced emissions and water consumption across its operations, according to the CRR.

"Customers today want clean, reliable and affordable energy solutions, and the significant emission reductions we’ve achieved show we’re committed to delivering it," said Ben Fowke, chairman, president and CEO. "I’m pleased with our results, which show that our efforts to ensure public safety, drive economic growth in the communities we serve, protect the environment, and provide safe, clean reliable energy at a competitive price are making a difference."

In 2015, Xcel Energy’s mercury emissions declined 85 percent. And since 2005, sulfur dioxide and nitrogen oxide emissions have declined 67 percent at its plants. Xcel Energy is on track to reduce carbon dioxide emissions by more than 30 percent by 2020 and also has cut water consumption by 30 percent at its operations, according to the report.

In 2015, carbon-free energy sources made up 34 percent of Xcel Energy’s electricity supply, and the company plans to grow its carbon-free energy sources to 43 percent by 2020. As the nation’s No. 1 utility wind energy provider for 12 consecutive years, Xcel Energy added four new wind farms in 2015, increasing its wind capacity by 15 percent.

The company expects wind to make up 24 percent of its electricity supply by 2020. And Xcel Energy also expects to triple the solar energy on its system by 2020.

Xcel Energy also ended coal operations at Black Dog Generating Station in Minnesota and the Cherokee Generating Station’s Unit Three in Colorado, as the company continues to work to reduce 25 percent of the coal-fueled capacity it owns by 2018, the CRR stated.

In addition, Xcel Energy offers 160 programs to manage electricity and natural gas use. In 2015 alone, customers saved more than one billion kilowatt hours of electricity, enough to power more than 137,000 homes annually, and 1.7 million dekatherms of natural gas, or enough to fuel more than 20,000 homes a year.

The CRR also details the company’s corporate citizenship. Xcel Energy contributed nearly $60 million in 2015 through grants, energy assistance and volunteer efforts. Other highlights from the report include:

- Storm response that is among the best in the industry, with the company managing more than 50 major storm events in 2015 and restoring service to 90 percent of customers within 12 hours.
- A focus on military hiring, with veterans making up nine percent of the company’s workforce in 2015, and 10 percent of newly hired employees for the year.
- Improved employee safety with employee injuries down approximately 50 percent since 2010.
Brown named chief security officer

Steve Brown has been named the new leader of its combined security organization as chief security officer (CSO). Brown was most recently at HP as the vice president of Operations and Cyber Intelligence Center in its Global Cyber Security organization.

“We have been moving forward with the creation of a new, consolidated security organization – an organization that combines physical security, cyber security, enterprise continuity and our data protection functions into a single organization,” said Marvin McDaniel, executive vice president and group president, Utilities and CAO.

First quarter 2016 earnings announced

Xcel Energy recently reported 2016 first quarter GAAP and ongoing earnings of $241 million, or $0.47 per share, compared with GAAP earnings of $152 million, or $0.30 per share, and ongoing earnings of $231 million, or $0.46 per share, in the same period in 2015.

Electric and gas margins rose in the first quarter of 2016 primarily due to an increase in retail electric and natural gas rates across various jurisdictions, non-fuel riders and a reduction in operating and maintenance expenses, said Ben Fowke, chairman, president and CEO. These positive factors were partially offset by higher depreciation, interest charges, property taxes and the negative impact of weather.

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“The goal of this new group will be to continue to expand our capability to protect our company, our employees and our assets — all with our customers and shareholders in mind,” he added. “We face new threats every day, and I’m excited about meeting this challenge.”

Brown brings strong leadership and security experience to Xcel Energy, McDaniel said. Including his previous role at HP, he was deputy CISO and had a 13-year career at Wells Fargo in Minneapolis, leaving as senior vice president of Enterprise Information Security Threat Management.

Brown started his career in the U.S. Navy, where he spent 20 years in information warfare, signals intelligence and network operations. He also spent a few years at the National Reconnaissance Office and sat on the board of directors for Information Technology-Information Sharing Analysis Center.

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Lineman Silhouette

John Gardner, an engineer with Electric Distribution Design in Lubbock, Texas, took this photo of Oscar Osornio, lineman journeyman from Levelland, Texas, with a blue sky streaked with clouds behind him, at South Elementary School in Levelland on a Friday morning.

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.
Xcel Energy is seeking to build, own and operate what would be the largest wind facility in Colorado, as well as one the state’s most cost effective wind projects.

The project also would be “Made in Colorado” – with the proposed 300 Vestas turbines being designed and manufactured in the cities of Pueblo, Brighton and Windsor. The effort would boost the capacity of Vestas turbines operating in the state today by nearly three times.

The Rush Creek Wind Project proposal, according to a filing made with the Colorado Public Utilities Commission (CPUC), includes 600 megawatts of new wind power and a corresponding 345-kilovolt transmission line of approximately 90 miles, which would be built in parts of five counties. The transmission line would be constructed to connect and carry the wind power from the turbines to the company’s Missile Site Substation in Deer Trail, Colo.

“We know our Colorado customers and communities want affordable energy from increasingly clean energy sources, and it is our goal is to provide what they value,” said David Eves, president of Xcel Energy-Colorado. “The Rush Creek Wind Project would provide them with the lowest-cost wind energy on our Colorado system.”

Invenergy, with a regional office in the state, has successfully developed renewable projects in Colorado and would act as the project’s lead developer, he said. And Vestas, one of the world’s leading wind turbine manufacturers, would produce all of the wind turbines at its Colorado manufacturing plants, where the company employs approximately 3,600 people.

“We are excited to partner with Xcel Energy on this important project that will support the local economy with meaningful jobs and provide renewable energy to Colorado consumers,” said Mick Baird, Invenergy’s vice president of Business Development for the Western Region. “Invenergy applauds both Xcel Energy and the State of Colorado on their renewable energy leadership.”

“We appreciate it and we’re honored,” said Chris Brown, president of Vestas Americas. “It’s nice to build for the state you’re in.”

As noted, the Rush Creek Wind Project must be approved by state regulators and granted land-use permits by each county. If approved by the CPUC and the counties, the project is expected to begin construction in late 2017, with anticipated commercial operations set for late 2018.

The Rush Creek Wind Project is expected to create substantial employment and economic development opportunities in eastern Colorado, Eves said, including approximately 350 jobs during construction and a $1 billion injection into the region’s economy.
Xcel Energy customers also will benefit from the project. By taking advantage of federal tax incentives known as Production Tax Credits (PTCs) for construction, Xcel Energy can reduce capital costs and directly pass these savings along to its Colorado customers, saving residents and businesses more than $400 million on a net-present-value basis over the 25-year life of the project.

According to a study by the Leeds School of Business at the University of Colorado, the proposed wind facility will result in more than 7,000 job years in Colorado over the 25-year period. The wind facility also will result in lower spending on electric generation fuel, and operation and maintenance costs, the study stated, resulting in lower electricity rates.

The project is a key component of Xcel Energy’s “Our Energy Future” vision for the state, focused on business strategies and opportunities to power new technologies, power the economy and empower customer choice.

“The Rush Creek Wind Project is an outstanding value for our customers and communities,” Eves said. “In fact, the forecasted cost of energy generated at Rush Creek is less than three cents per kilowatt hour. “And integration of new wind power will eliminate one million tons of carbon emissions each year,” he added. “We see wind as a vital resource for the state.”

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**Rush Creek Wind Project**

A quick glance at our proposal to deliver more low-cost, carbon-free wind power to Colorado and inject $1 billion into the region’s economy

**Largest wind project in the state**

600 megawatts of clean, renewable energy to customers

That’s enough to power more than 325,000 homes

90 miles of transmission line to connect and carry wind power output from the turbines to our existing Missile Site Substation

**Choices customers want**

Will provide the lowest-cost wind power on our system at less than three cents per kilowatt hour

Projected to reduce one million tons of carbon each year

**Powering the economy**

Up to 240 wind farm development jobs

Up to 100 transmission line construction jobs

Up to 30 substation construction jobs

“Made in Colorado” 300 Vestas wind turbines to be designed and manufactured in Brighton, Pueblo, and Windsor

Will benefit landowners in five counties: Arapahoe, Cheyenne, Elbert, Kit Carson, and Lincoln

$180 million in landowner lease payments and property taxes

Will save customers: $800 million over the next 25 years

Majority of savings occurs in first 10 years of operation

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Thanks sent for 35 years of METRIGS Dinners

To the Editor:

I would like to send my thanks to Bob “Sweed” Nielsen, who organized the METRIGS (Metro Employees, Transferees, Retirees in Gas Service) Dinner for Denver Gas Metro for the past 35 years (usually at a local Elks Lodge for both office and field personnel). He has decided not to do the dinner any longer after all these years. I am sure a lot of people will miss it, as I will.

I have known Sweed for more than 40 years, and he is a lot of fun to be around. Thanks again, Sweed. You’re the best.

—Tanya McLeod

‘Wow, was that nice of them’

Dear Xcel Energy:
At about 8:20 a.m., I had a flat tire going east on Myrtle Street and leaving Stillwater, Minn. One of your service trucks and two male workers stopped and offered to change my tire. My husband was on his way, so I turned down the offer. But wow, was that nice of them! Just wanted to say thanks.

—Betty

‘Delighted to see glorious array’

Dear Xcel Energy:

Thank you, thank you, thank you for your splendid work!

After a necessary upheaval of gardens to complete underground electrical work, your company said you would return in the spring. One day in May, your experts appeared and prepared the ground perfectly. Then we went away for the Memorial Day weekend. When we returned, we were delighted to see a glorious array of several varieties of plants – all in a lovely arrangement. They are thriving, and we are grateful for your fine work. Thank you!

—Jeannette and Stan

Online Xtra subscription available for employees and retirees

Employee readers of Xtra can now 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.

As a reminder, Xcel Energy’s main phone number is 800-328-8226. Just hit “0” for an operator to contact various departments and employees.

Fowke named to NIAC by President Obama

Ben Fowke, chairman, president and CEO, has been appointed to the National Infrastructure Advisory Council (NIAC) by President Barack Obama.

“I am honored to represent the energy industry as part of the NIAC,” Fowke said. “These kinds of public-private partnerships are an important part of helping to mitigate potential risks to our industry and ensuring the integrity of our nation’s critical infrastructure.”

Established in 2001, the NIAC is charged with improving the cooperation and partnership between the public and private sectors. It advises government agencies on policies and strategies that range from risk assessment and management to information sharing to protective strategies and clarification on roles and responsibilities between government and industry.
We’ve all heard the adage, “If it isn’t broke, don’t fix it.” Tied to those words of wisdom, however, is the idea of keeping things from breaking, as well.

And one way of doing that is through careful monitoring and maintenance in order to avoid problems.

Both of those practices are coming together in the new Heat Rate Monitoring program in Energy Supply, aimed at minimizing fuel costs, maximizing power-plant efficiencies and avoiding unplanned outages.

“Zeroing in on the heat rates of our generating facilities is an important way for us to get the most out of the amount of fuel consumed by our power plants,” said Mark Fox, general manager of Power Production in Colorado, who is leading the cross-region, multi-department team.

“Because fuel to run our units constitutes close to 90 percent of our operating costs,” he added, “any improvements to our heat rates can lead to a significant reduction in those costs.”

A generating unit’s heat rate is the amount of heat input into a system, divided by the amount of power generated by that system. “Design heat rate” is a tool that provides a definable benchmark for comparison and trending purposes.

One of the most important goals of the new monitoring program is the “best achievable heat rate,” he said, or the net heat rate obtained from a unit when its equipment was new and operated at optimum performance.

A one percent improvement in a generating station’s heat rate reduces fuel consumption by one percent, thus reducing fuel costs, as well as dropping emissions by one percent.

Monitoring heat rates also offers the advantage of identifying potential problems or changes to power plant systems – and allowing proactive maintenance to restore them to optimal operating conditions.

Understanding heat rates is critical not only in terms of maximizing fuel efficiency, but also in gaining a better understanding of power plant equipment’s “state of health,” Fox said.

Numerous controllable parameters, such as a turbine’s main steam temperature, can provide crews with vital data on when equipment might need adjustments or replacement.

The benefits of regular documentation of heat rates, then, are numerous and invaluable in terms of power-plant efficiency, he said. And that can relate to lower overall fuel costs, reduced chemical costs, increased generation capabilities, higher unit availability and a reduction in levels of emissions.

“Basically power plants use fuel to create heat, which is then used to generate energy,” Fox explained. “So our Heat Rate Monitoring program helps us develop policies and procedures that allow us to do that at the lowest cost possible across our fleet.

“We started by determining how to best achieve that goal,”
he added. “And careful, systematic heat rate monitoring became an obvious, best-case alternative.

“Our customers want us to repair or replace equipment when needed, of course, to ensure reliability and cut costs by avoiding catastrophic outages,” he said. “But just as with an automobile, you don’t want to overspend on maintenance – replacing parts before their useful lifetime.

The Heat Rate Monitoring program came together through a coordinated effort, with representation and participation from both Energy Supply’s Operations and Technical Services organizations.

The program was developed to identify, develop, communicate, train, coordinate and execute heat rate monitoring activities, which will be executed by Energy Supply employees on all generating units, he said. That training began at the end of 2015 and went into full implementation in January.

Running the monthly tests requires 90 to 120 minutes also began in January. And all of Xcel Energy’s conventional steam, combined-cycle and combustion-turbine units are now undergoing the monthly heat rate tests.

Five major systems will be evaluated during the tests, including boilers, turbines, condensers, feed-water heaters and cooling towers.

Each month, Valves Wide Open (VWO) test data is being collected for each generating unit via standardized processes. After monitoring, test data is added to the VWO tracking sheets, Fox said. That data is then evaluated and reviewed by plant staff, working in cross-departmental teams.

Those teams will determine and evaluate variances in the data, then make appropriate recommendations and generate any needed work orders. Teams will review and follow up, as needed, continuing to monitor the results of actions taken.

“The teams’ work, as well as all of the training, has gone very well,” Fox said. “Meeting our schedule was challenging, at times, but we did meet our timeline.

“And we are confident that this program will bring very significant benefits to our customers, and to the company as a whole – by finding the most effective and efficient balance of maintaining performance and avoiding problems.”
The successful and efficient operation of power plants is closely tied to a facility’s chemistry makeup and maintenance. But the careful monitoring and management of those diverse chemical compounds is generally defined by “non-events” and so can be easily overlooked.

It’s worthwhile, then, to highlight some ongoing successes brought about by members of Energy Supply’s System Chemistry group to understand the importance of their work.

The central support group is made up of three chemists in the Upper Midwest, three in the Texas/New Mexico region and two in Colorado. They provide oversight and support for the system chemistry programs at their respective region’s power plants.

“Central chemistry planning is essential to efficient long-term power plant performance,” said Bernie Wieck, consulting system chemist in Amarillo. “Small contamination events over a long period can greatly reduce the life expectancy and reliability of a boiler, for instance, which is often the weakest link in a plant’s forced-outage rate.

“Central chemistry planning is essential to efficient long-term power plant performance,” said Bernie Wieck, consulting system chemist in Amarillo. “Small contamination events over a long period can greatly reduce the life expectancy and reliability of a boiler, for instance, which is often the weakest link in a plant’s forced-outage rate.

“Good chemistry performance is measured by events that don’t take place,” he added. “Therefore, it can be easily overlooked when evaluating reliability improvement.”

Xcel Energy’s System Chemistry group has a long history of identifying and evaluating new and emerging technologies that could prove beneficial to the company’s power plants, said Andrew Howell, senior system chemist in Denver.

“And this is frequently done in cooperation with or even led by our plant chemists as they become aware of these technologies,” he said.

There have been a number of significant industry changes and improvements in chemistry-management strategies over the years, Howell said, and the alignment of each plant’s online instrumentation for chemistry monitoring with top industry standards has been completed at the company.

“We provide inspection services to evaluate water-touched surfaces for evidence of corrosion, scaling or biological fouling, collect samples to evaluate water, lubrication oils and insulating oils, and research new methods” Wieck explained. “Like your physician uses testing and evaluation, we also use a variety of methods to help evaluate the condition of our patient— the power plant.”

For power plant operations, chemistry treatment programs are crucial to avoid potential damage to boiler and turbine components, said John Heisick, senior system chemist in Minneapolis. Chemistry surveillance systems continually monitor conditions, for example, and sophisticated instrumentation capable of measuring trace concentrations is used to detect contamination.

The group has tested new online technologies that offer big improvements and then implemented them throughout the company as the new standard. The ability to remotely access plant data allows for monitoring of current chemistry condi-
Chemistry control is preventive maintenance, meaning success is defined by 'what did not happen,'” Heisick said. “So it’s often difficult to quantify in cost savings, except by benchmarking with industry experience.”

The System Chemistry group’s efforts recently have brought some impressive results at various power plants throughout the Xcel Energy fleet. For example, it successfully tested magnesium-oxide additions at Tolk Generating Station, which significantly reduced silica concentrations in the effluent. And as a result, this practice is now being used throughout the plant’s water treatment system, helping minimize water use.

And a methodical chemistry approach – based on an industry best practice – has been successfully applied at Valmont Generating Station to resolve a problem with persistent turbine deposition that had resulted in a five-megawatt deficit. The resulting generation benefit has exceeded $1 million a year.

At Pawnee Generating Station, replacement of feed-water heaters to deal with high copper concentrations has improved startup time by nearly half, with a generation benefit estimated at up to $4.2 million over four years.

Other recent improvements by the System Chemistry include assisting with new plant-chemistry plans and components, particularly regarding the challenging chemistry for Comanche Generating Station’s unique Unit Three cooling system. The team also has been working to identify the optimal chemistry management for generating units that cycle on and off frequently, which can disrupt chemistry stability.

In addition, System Chemistry develops policies and procedures for adapting to changes in ongoing environmental restrictions on water discharges. And online chemistry instruments are frequently replaced when upgrades are deemed beneficial.

Throughout our development of new processes and procedures, collaborating with industry groups has been a tremendous help for adopting state-of-art practices,” Howell said. “The Electric Power Research Institute has been at the forefront with these groups, providing cutting-edge concepts and proving them for plant use.

“In addition, trade meetings are excellent sources of information and contacts,” he added. “And System Chemistry has a primary role in participating in such meetings and transferring our knowledge gained to plant chemistry personnel.”

“In 2004, we began to track key chemistry-index indicators in our plants,” Heisick added. “The effort aimed at improving plant-chemistry performance to achieve 90 percent compliance of boiler and feed-water chemistry. We have since initiated several improvements over the last 10 years, and our compliance is now at more than 98 percent.”
KnowledgeKeeper tool retains and transfers important knowledge
Knowing what to do is often a matter of remembering how to do it. But if that can impact safety or service reliability, guessing just won’t do.

That’s one of the reasons why a new knowledge tool at Xcel Energy is proving so useful.

“KnowledgeKeeper is a video library with programs to show employees how to do a task correctly,” said Cris Zimmerman, manager of Transmission Technical Compliance Training. “We also can re-create an event and show what happened and why — giving us another way to learn from each other. It’s an important way for the company to retain and transfer knowledge as we create a competitive workforce.”

The tool also helps Xcel Energy stay in compliance with North American Electric Reliability Corporation (NERC) Critical Infrastructure Protection and other standards.

“We actually learned about KnowledgeKeeper at a NERC conference,” said Zimmerman. “And we immediately saw how this could be a very useful tool for us.”

Recently, for example, an employee was assigned to calibrate settings at a substation. The task was not a routine one, and it had been several years since the employee had performed it. So before traveling to the substation, he watched a video as a refresher and successfully changed the settings.

Had KnowledgeKeeper not been available, he would likely have had to ask someone to provide step-by-step instructions to him over the telephone, Zimmerman said. Not only would that have taken more time, but the employee would have been working in an energized setting longer, as well.

“Human performance is all about how you do your job and do it correctly — consistently in a safe and reliable way,” explained Justin Shelton, senior technical instructor in Transmission. “KnowledgeKeeper is a tool to help us achieve that. Human performance tools are part of employees’ mental personal protective equipment, keeping them safe and keeping our operations going 24/7.”

The KnowledgeKeeper tool has been piloted in Transmission for more than two years. Some of the factors in assessing its value include security of content, ease of use by field workers and alignment with the Productivity through Technology (PTT) mobility strategy.

As a cloud-based subscription service, an employee only needs to connect to the Internet and have authorized access to view the video collection on a laptop, tablet or smartphone.

The videos are similar to the short and simply narrated programs on YouTube, with lengths ranging from five to 10 minutes. Various security levels are built in to the tool, as well as geo-tagging and search capabilities.

Footage can be taken using any high-definition camera, including iPhones, GoPro and regular hand-held video cameras. The footage and sound or narration tracks are edited, if needed, reviewed and approved, and then uploaded to the KnowledgeKeeper site.

At the start of the pilot, Transmission had approximately 125 site licenses, used primarily by relay protection technicians, Shelton said. Recently the number of licenses was increased to 1,500 — at very little additional cost — so nearly anyone in Transmission can view the programs.

“There are more than 70 videos in the library now, with programs for relay, substation and breaker work, electric systems and construction,” Shelton said. “Most of the programs are generic enough to be applicable across all our operating companies. And with geo-tagging, a person can travel to a facility and pull up every video that pertains to a specific substation or location.”

How are topics for videos selected? Several factors are considered, including the difficulty, importance and frequency of the task, Zimmerman said.

“If a task is difficult and important, but performed infrequently, it’s likely that workers can forget how to do it,” he said. “That makes it a safety and reliability risk, and could point to a need for a video.”

Once a need is found, Zimmerman and his team identify a subject matter expert, such as a journeyman who can share his experience and knowledge. The employee might be the “talent” in front of the camera or explain the job from behind the camera.

While Transmission piloted the use of KnowledgeKeeper, other departments can set up and produce their video libraries, too. With a storage limit of 5,000 programs, the tool can be a part of Xcel Energy’s knowledge transfer and safety processes for years to come.
Friends We'll Miss


Charles BessOn, 90, senior technician, Gas Engineering, Colorado, died on April 19, 2016. He worked for PSCO from 1964 to 1986.

Stanley Bettis, 90, district foreman, Minnesota, died on March 20, 2016. He worked for NSP from 1960 to 1993.


Fred Curtis, 90, customer service specialist, Distribution Engineering, Minnesota, died on April 24, 2016. He worked for NSP from 1952 to 1987.


Thelma Diedrichs, 84, business clerk, Corporate Facilities and Real Estate, Colorado, died on Nov. 27, 2015. She worked for PSCO from 1980 to 1997.

Harold Dill, 96, facilities locator, Gas Distribution, Lipan Service Center, Denver, Colo., died on Nov. 8, 2014. He worked for PSCO from 1960 to 1986.

Gerald Doran, 67, auto mechanic, Fleet, Amarillo Substation Transmission, Amarillo, Texas, died on April 7, 2016. He worked for SPS from 1982 to 2013.


Lawrence Evans, 95, lead appliance serviceman, Colorado, died on April 12, 2016. He worked for PSCO from 1941 to 1983.


Lawrence Gilety, 85, line truck operator, Line Construction, Colorado, died on March 20, 2016. He worked for PSCO from 1953 to 1986.

James Gilroy, 67, senior pricing analyst, Regulatory, 401 Nicollet Mall, Minneapolis, Minn., died on April 19, 2016. He worked for NSP from 1979 until the time of his death.

Robert Haefner, 89, general account supervisor, Accounting, Minneapolis, died on March 27, 2016. He worked for NSP from 1956 to 1987.


John Howard, 64, mechanic specialist, Maintenance, Hayden Station, Hayden, Colo., died on March 16, 2016. He worked for PSCO from 1990 until the time of his death.

Helal Islam, 78, senior engineer, Transmission Planning South, Amarillo Tower, Amarillo, Texas, died on April 2, 2016. He worked for Xcel Energy from 2008 until the time of his death.


Don Klaus, 77, senior computer analyst, Denver West Office Complex, Denver, Colo., died on April 27, 2016. He worked for PSCO from 1965 to 1994.


Lawrence Lam{ar, 69, storekeeper, Material Logistics, Mesa County Operations Center, Grand Junction, Colo., died on March 30, 2016. He worked for PSCO from 1981 to 2009.


Harry Newton, 77, heavy equipment operator, Regional Production, Pawnee Station, Brush, Colo., died on April 1, 2016. He worked for PSCO from 1988 to 1994.


Stanton Olson, 89, senior design supervisor, Information Management, General Office, Minneapolis, Minn., died on April 15, 2016. He worked for NSP from 1949 to 1988.


David Sandstrom, 74, overhead working foreman, Kipling Service Center, Lakewood, Colo., died on March 5, 2016. He worked for PSCO from 1963 to 2003.

Max Schlav, 76, working gas foreman, Southeast Metro Gas Operations, Valenta Service Center, Denver, Colo., died on April 11, 2016. He worked for PSCO from 1951 to 1998.


James Talbot, 93, order reader, Meter Reading, Colorado, died on April 12, 2016. He worked for PSCO from 1954 to 1986.

Roy Terry, 74, working foreman, Panhandle Metering South, Northeast Service Center, Texas, died on March 25, 2016. He worked for SPS from 1964 to 2004.


Lois Vevle, 92, gas distribution coordinator, Gas, Faribault Service Center, Faribault, Minn., died on April 2, 2016. She worked for NSP from 1948 to 1985.

Madeline Webb, 95, Texas, died on March 17, 2016. She worked for SPS from 1954 to 1986.

David Winter, 70, senior hazardous waste technician, Environmental and Regulatory Affairs, Chestnut Service Center, Minneapolis, Minn., died on March 15, 2016. He worked for NSP from 1982 to 2014.

George Yangita, 80, technical services manager, General Office, Minneapolis, Minn., died on Feb. 22, 2016. He worked for NSP from 1947 to 1982.

Retiring

Marty Apodaca (papadacal@comcast.net), lead fitter B, Gas Construction, Arvada Service Center, Arvada, Colo., retired June 10, 2016. He worked for Xcel Energy for 36 years.
John Bass, working foreman, Line Department, Arvada Service Center, Denver, Colo., retired May 12, 2016. He worked for Xcel Energy for 35 years.

Aurora M. Blechinger (sweetfaceamb@gmail.com), collection specialist, Revenue Recovery and Credit Support, La Crosse, Wis., retired April 29, 2016. She worked for Xcel Energy for 42 years.

Ken Bolin (kerinbolin@gmail.com), senior plant engineer, PETS, Fort St. Vrain, Platteville, Colo., retired May 2, 2016. He worked for Xcel Energy for 25 years.

Laurie L. Borell (Lborell@aol.com), procedure writer, Monticello Nuclear Plant, Monticello, Minn., retired June 3, 2016. She worked for Xcel Energy for 35 years.

Kimberly Buhl, gas meter lead, Gas Meter, Rice Street Service Center, St. Paul, Minn., retired June 30, 2016. She worked for Xcel Energy for 36 years.


Phil Chadwick, service representative, Call Center, Center Pointe, Roseville, Minn., retired April 8, 2016. He worked for Xcel Energy for 14 years.

Anita Champ, senior associate, Kipling Service Center, Lakewood, Colo., retired June 30, 2016. She worked for Xcel Energy for 24 years.

Linda R. Clark, supervisor, Revenue Recovery, La Crosse, Wis., retired May 31, 2016. She worked for Xcel Energy for 28 years.

Janice Collins (georgiapiache@sfglobal.net), customer service representative, Customer Service, Amariillo Call Center, retired April 4, 2016. She worked for Xcel Energy for 14 years.

Alan W. Cragoe, system field technician, Maple Grove Service Center, Maple Grove, Minn., retired May 27, 2016. He worked for Xcel Energy for 35 years.

Scott DeGree, lead gas dispatcher, Gas Dispatch, Rice Street Service Center, St. Paul, Minn., retired May 3, 2016. He worked for Xcel Energy for 33 years.

Thomas L. Elden (kriselden340@comcast.net), foreman trouble, Control Center, St. Paul, Minn., retired April 29, 2016. He worked for Xcel Energy for 47 years.

Wayne Griebel, engineering manager, Energy Supply, SPS Tower, Amarillo, Texas, retired June 3, 2016. He worked for Xcel Energy for 34 years.

Michael Grimsley, operations manager, Operations, Sherco Plant, Becker, Minn., retired June 6, 2016. He worked for Xcel Energy for 36 years.

Ceace (Cecilia) Fehn Haagensen, senior representative, Community Affairs, 401 Nicollet Mall, Minneapolis, Minn., retired June 3, 2016. She worked for Xcel Energy for 44 years.

Mark Haider, lead plant equipment operator, Operations, Sherco Plant, Becker, Minn., retired May 20, 2016. He worked for Xcel Energy for 31 years.

Joyce Harlan (joyhar397@gmail.com), specialist, Accounts Payable, Henderson, Colo., retired April 29, 2016. She worked for Xcel Energy for 37 years.

Keith A. Haugen (sehkah1000@gmail.com), lead repairman welder, Maintenance, Sherco Plant, Becker, Minn., retired May 10, 2016. He worked for Xcel Energy for 37 years.

David Hoo (davidhoo@mchsi.com), operating maintenance technician, Facilities Service, Minnetonka Division, Shorewood Service Center, retired April 15, 2016. He worked for Xcel Energy for 43 years.

Carol N. Johnson (carol.johnson.623cj@gmail.com), specialist, Billing, Fargo, N.D., retired June 3, 2016. She worked for Xcel Energy for 40 years.

David A. Kline, line crew foreman, Overhead, Chestnut Service Center, Minneapolis, Minn., retired May 31, 2016. He worked for Xcel Energy for 36 years.

Kay W. Kries (kKay22@charter.net), representative, Customer Contact Center, Sky Park, Eau Claire, Wis., retired June 1, 2016. She worked for Xcel Energy for 22 years.

Dave Land, control specialist, Operations, Zuni Station, Denver, Colo., retired July 22, 2016. He worked for Xcel Energy for 31 years.


Daniel Lusk (danielglusk@gmail.com), reliability standards and compliance manager, Energy Supply, 1800 Larimer, Denver, Colo., retired April 27, 2016. He worked for Xcel Energy for 36 years.

Fred Mayhew, mechanic, Gateway, Aurora, Colo., retired May 31, 2016. He worked for Xcel Energy for 40 years.

Richard McPherson (melmac2@hotmail.com), instrument and control technician II, PTT, Pawnee Power Plant, retired April 29, 2016. He worked at Xcel Energy for 17 years.

Shane Meek, working foreman, Electric Trouble, Lipan Distribution Center, Denver, Colo., retired May 1, 2016. He worked for Xcel Energy for 39 years.

Elaine Mantano, supervisor, Contracting Services, Arvada Headquarters, Arvada, Colo., retired April 1, 2016. She worked for Xcel Energy for 32 years.

Mike O’Callaghan (mikeoc427@gmail.com), senior natural gas fuel mechanic, High Pressure Gas, Brighton, Colo., retired June 30, 2016. He worked for Xcel Energy for 26 years.

David E. Olson (dolson1555@gmail.com), manager, Budgeting and Reporting, Energy Supply Finance, Material Distribution Center, Henderson, Colo., retired April 29, 2016. He worked for Xcel Energy for 39.5 years.

Lawrence Peluf, technician II, Meter Department, Chestnut Service Center, Minneapolis, Minn., retired May 6, 2016. He worked for Xcel Energy for 34 years.

Milt Perry, representative, Business Solutions Center, 1800 Larimer, Denver, Colo., retired July 1, 2016. He worked for Xcel Energy for 28 years.

Candy Pettit, technician, Design, Southwest Metro Division, Lakewood, Colo., retired May 31, 2016. She worked for Xcel Energy for 38 years.

Mark Rusk, lead electrician, Maintenance, Monticello Nuclear Plant, retired May 13, 2016. He worked for Xcel Energy for 37 years.

Kelly S. Smith (sickdog656@gmail.com), control specialist, Operations, Energy Supply, Pawnee Station, Brush, Colo., retired April 15, 2016. He worked for Xcel Energy for 35 years.

Carol Snyder, senior representative, Business Solutions Center, 1800 Larimer Street, Denver, Colo., retired May 2, 2016. She worked for Xcel Energy for 31 years.

Michael T. Spahn, working foreman, Gas Emergency Response, Lipan Distribution Center, Denver, Colo., retired July 1, 2016. He worked for Xcel Energy for 37 years.


Bob Young (youngcynthia@wwdb.org), working foreman, Northeast Substations, Greeley, Colo., retired May 31, 2016. He worked for Xcel Energy for 33 years.
If energy comes into your home by overhead power lines, you need to be very aware of where those lines are. Always keep yourself, your ladders and tools at least 10 feet away from them. And if you see a line that has come down, stay away from it and call Xcel Energy at 1.800.895.1999.