Minnkota

MESSENGER

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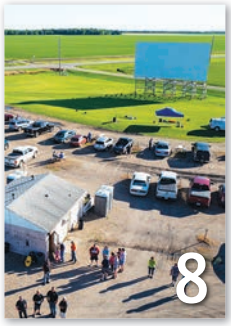
Resilience, responsibility and reliability

Minnkota MESSENGER

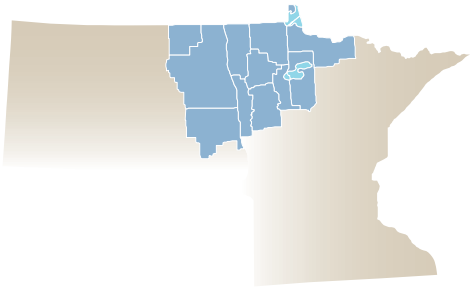
July-August 2020

Contents

Features



On the cover: Minnkota lineworker Shawn Reimers helps string wire on a completely rebuilt section of 69-kilovolt transmission line near Cavalier, N.D. The rebuild project is part of a larger effort to address aging infrastructure and improve reliability for the Minnkota member systems.



Minnkota Power Cooperative is a generation and transmission cooperative headquartered in Grand Forks, N.D. It supplies wholesale electricity to 11 member-owner distribution cooperatives, three in eastern North Dakota and eight in northwestern Minnesota. Minnkota also serves as operating agent for the Northern Municipal Power Agency, an association of 12 municipal utilities in the same service region. Together, the Joint System serves more than 153,000 customers.

Minnkota Messenger is published six times a year by Minnkota Power Cooperative. Its mission is to communicate Minnkota's perspectives and concerns to its members, elected officials, employees and other business audiences. For editorial inquiries, call (701) 795-4282 or email bfladhammer@minnkota.com.

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Minnkota honored for GFPD support

The evening before Officer Cody Holte's memorial service, the Minnkota print shop was bustling with activity.

Employees were working quickly to complete the final printed materials for the June 2 service at Ralph Engelstad Arena. Minnkota provided 5,000 memorial programs and another 5,000 inserts at no cost to the Grand Forks Police Department and Holte family.

Police Chief Mark Nelson recognized Minnkota for its support with a plaque, which was accepted by CEO Mac McLennan on July 22.

"This is a great organization and we're humbled that you stepped up and helped us," Chief Nelson said during the presentation.

GFPD Officer Cody Holte was killed in the line of duty during an incident on May 27. The connection to Minnkota came through Travis Jacobson, safety and physical security supervisor, who formerly served on the GFPD and worked with Officer Holte. A few of Jacobson's friends on the force had mentioned that no local printing options were available on short notice, due in part to COVID-19. Running out of time and options, Jacobson reached out to Minnkota management and the print shop to see if the cooperative could help.

"It was obviously a difficult time," Jacobson said. "It was personally moving for me to see Minnkota step up and support the community and support the police department. It meant a lot to me."


Officer Cody Holte

"There was never any hesitation on anyone's part from the top down," said Troy Ahonen, print and mailing services supervisor. "I feel honored that we were able to pull together and get this done for the family and our law enforcement personnel."

Jacobson was in contact with Ahonen over the weekend and the files began arriving on Monday. At 5 p.m., the print shop received the final materials needed, but errors were soon discovered in the design and text. That's when the Communications group jumped in to proofread and make the appropriate corrections.

Along with Ahonen and Jacobson, help was provided by Rhonda Amundson, Mary Merrill, Monica Hanson and Kaylee Cusack.

By **Ben Fladhammer**

Cooperative spirit shines during annual meetings

RETIRING BOARD MEMBERS RECEIVE FOND FAREWELL

Cloth masks covered the faces of Minnkota Power Cooperative and Square Butte Electric Cooperative directors as they quietly filed into their spots spaced 6 feet apart.

From the start, it was clear the 2020 annual meetings would be like no other in the history of the two organizations.

Although the hearty handshakes and standing-room-only crowds were missing, the cooperative comradery still shined through on July 30 for the 40 in-person attendees and the 100 members and guests who joined online.

The meetings were originally scheduled for April 2, but were postponed as a precaution against the spread of COVID-19. Nearly three months later, significant protections were put in place to hold the meetings on-site for a limited number of attendees.

"What a world we live in," said Mac McLennan, Minnkota president and CEO, as he opened his report to the membership. "If you would have told me last year that I would start this report by taking off a mask and looking into a pretty small crowd, I wouldn't have believed you."

The meeting format was only the beginning of the changes that would unfold during the day. Five longtime directors retired from the Minnkota and Square Butte boards

"It's been a great experience and a valuable education. I'm going to miss it a lot. I'm going to miss the people. Minnkota has great employees, great management and a competent board of directors. I've got no doubt that they will continue to serve us well into the future."

– Collin Jensen, retiring chair of Minnkota board of directors

during the meeting. Not even the masks could hide the emotion as the focus shifted toward the people behind the power.

The membership recognized the significant contributions of the following retiring directors:

- Collin Jensen – 25 years on the Roseau Electric Cooperative board, 21 years on the Minnkota board and 10 years as Minnkota board chair;
- Jeff Folland – 30 years on the PKM Electric Cooperative board and 23 years on the Minnkota board;
- Leroy Riewer – 15 years on the Clearwater-Polk Electric Cooperative board and seven years on the Minnkota board;
- Sid Berg – 17 years on the Cass County Electric Cooperative board and seven years on the Minnkota board; and
- Gary Mathis – 39 years on the Clearwater-Polk Electric Cooperative board and 31 years on the Square Butte board.

"We've been blessed with leaders and not followers," McLennan said as he individually recognized each of the departing directors.

Vice Chair Les Windjue, who was elected as the new board chair after the meeting, thanked Jensen for his dedication to the Minnkota member systems.

"What I respected most about serving on the board with Collin is his commitment to the membership," Windjue said. "He has the unique ability to bring people together who have diverse viewpoints and find cooperative solutions that benefit Minnkota and all the members. Collin's honesty, integrity and sound judgment have established him as an outstanding leader and he will be greatly missed."

A fond farewell

During his final address to the membership, Jensen reminisced on his family history in the rural electric cooperative industry. His grandfather, Henry, was one of the founders of Roseau Electric Cooperative in 1940 and helped build the original distribution system in the area. Collin's father, Jack, carried on the tradition and served on the Roseau Electric board from 1972 to 1994. He also served on the Minnkota board from 1980 to 1994.

Like father, like son, Collin joined the Roseau Electric board in 1994 and has been Roseau's representative on the Minnkota board since 1999. He was elected vice chair in 2002 and then elected chair in 2010.

"It's been a great experience and a valuable education," Jensen said. "I'm going to miss it a lot. I'm going

Five Longtime Directors Retire

Collin Jensen
Minnkota Power Cooperative

Jeff Folland
Minnkota Power Cooperative

Leroy Riewer
Minnkota Power Cooperative

Sid Berg
Minnkota Power Cooperative

Gary Mathis
Square Butte Electric Cooperative

to miss the people. Minnkota has great employees, great management and a competent board of directors. I've got no doubt that they will continue to serve us well into the future."

Before closing his remarks, Jensen was quick to remind the audience that he will continue to be active in his cooperative.

"I'm still a member. I'm going to continue to get my energy through Minnkota and Roseau Electric," Jensen said with a smile.

New leadership

During the reorganizational session, both boards elected new officers to lead Minnkota and Square Butte into the new decade. Windjue, Nodak Electric, was elected as Minnkota board chair and Steve Arnesen, North Star Electric, was elected as vice chair. Colette Kujava, Red Lake Electric, was reelected as secretary-treasurer.

For Square Butte, Paul Aakre, PKM Electric, was elected as president and Larry Sollie, Wild Rice Electric, was elected as vice president. Roger Amundson, Roseau Electric, was reelected as secretary-treasurer, while Tony Ottem, Cavalier Rural Electric, was elected as assistant secretary-treasurer.

In addition to approving the reports and resolutions, the membership also approved changes to Minnkota's bylaws – an effort that the entire membership had worked on over the last year. The changes were made to modernize and clean up inconsistencies, adapt the bylaws to Minnkota's present practices and to better manage risk.

Successful 2019

By most all measures, Minnkota and Square Butte had excellent years in 2019. The cooperatives' generation facilities operated safely and dependably. The power delivery system was bolstered by projects to improve reliability. And both orga-

Electric Hammer Awards

Recognizing 25 years of service as a Minnkota member system director

Michael Hanson
North Star Electric Cooperative

Steve Hart
Cavalier Rural Electric Cooperative

Collin Jensen
Roseau Electric Cooperative

Donald Skjerheim
Cavalier Rural Electric Cooperative

Red Lantern Awards

Recognizing 10 years of service as a Minnkota member system director

Del Gage
Cavalier Rural Electric Cooperative

Steve Goodwin
PKM Electric Cooperative

Judith Honer
Beltrami Electric Cooperative

Colette Kujava
Red Lake Electric Cooperative

Tony Ottem
Cavalier Rural Electric Cooperative

Randy Versdahl
Red Lake Electric Cooperative

nizations are in a solid financial position.

Square Butte President Marcy Svenningsen applauded the Young Station for its strong safety record, which reached 1 million work-hours without a lost-time injury in 2019. The performance was especially impressive during a major maintenance outage on Unit 2 during the fall.

"This culture of safety and security is something that these men and women live and breathe every day, so that they – and their fellow workers – can arrive home healthy after every shift has ended," Svenningsen said.

Stability between Minnkota and Square Butte provides an opportunity for the cooperatives to pursue bold initiatives like Project Tundra, which aims to build the world's largest carbon capture facility in North Dakota. The system would remove more than 90% of the carbon dioxide from the Young Station's Unit 2 generator and permanently store it more than a mile underground in deep geologic formations. Significant research is being conducted to better define the engineering, design and project economics. The Minnkota board is expected to make a decision on whether to continue forward with Project Tundra in mid-2021.

"We continue to see a substantial focus on the environment," McLennan said. "Project Tundra is the potential answer to help address that focus around the world."

As COVID-19 and social changes continue to transform our world, McLennan closed his report with a note of optimism.

"We have a committed membership. We are blessed with dedicated employees. We have a willingness to look ahead and not behind," McLennan said. "I remain optimistic that we will meet the challenges ahead. But it will not come without support from the membership and it won't happen if we don't stay together."

By **Ben Fladhammer** / Photography **Michael Hoeft**

Minnkota Board Officers and New Directors

Les Windjue
Chair
Nodak Electric Cooperative

Steve Arnesen
V. Chair
North Star Electric Cooperative

Colette Kujava
Sec./Treas.
Red Lake Electric Cooperative

Marcy Svenningsen
Cass Couty Electric Cooperative
New director

Greg Spaulding
Clearwater-Polk Electric Cooperative
New director

Tom Woinarowicz
PKM Electric Cooperative
New director

Mike Wahl
Roseau Electric Cooperative
New director

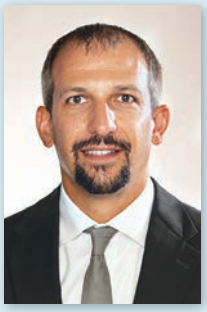
Square Butte Board Officers and New Directors

Paul Aakre
President
PKM Electric Cooperative

Larry Sollie
V. President
Wild Rice Electric Cooperative

Roger Amundson
Sec./Treas.
Roseau Electric Cooperative

Tony Ottem
Asst. Sec./Treas.
Cavalier Rural Electric Cooperative



Kalvin Hoff
Cass County Electric Cooperative
New director

Bill Lanners
Clearwater-Polk Electric Cooperative
New director

Dinos, drive-ins and democracy

PKM ELECTRIC COOPERATIVE SPINS PANDEMIC CONCERNS INTO UNIQUE ANNUAL MEETING ENGAGEMENT

The lot of the Sky-Vu Drive-In Theatre in Warren, Minn., was brimming with vehicles on July 14. Dozens of families had settled into their seats with popcorn in their laps and Pepsi in their cupholders. But "Jurassic Park" wouldn't hit the large, wooden screen until the sun dropped in three hours.

This was PKM Electric Cooperative's showtime.

"If I can have a motion, could somebody honk?" PKM president Tom Woinarowicz's request passed through the 93.1 airwaves of car radios and was met with one quick honk.

"A second?" Honk, honk.

Through a chuckle, Woinarowicz continued. His "All in favor?" was followed by chorus of beeps, and his "All opposed?" drew silence. "There you go, you guys are listening. This is really going good!" he beamed.

The uncommon business meeting was driven not by the desire for fun, but by the need for democracy.

Nostalgia was on the annual meeting agenda as cars and trucks of all makes and models made their way into the drive-in parking area.

Health guidelines spurred by the COVID-19 pandemic forced PKM to postpone its 80th annual meeting scheduled for April. Cooperative bylaws require an annual meeting of the members every year. These meetings allow every member to have a voice in the election of their district directors for the board, to hear the co-op's financial standing and to learn about the milestones of the past year.

"We knew we had to reschedule," said Jeff Rustad, PKM manager of member services. "We talked about the drive-in and how easy it would be to do it here. You can socially distance if you want, and people can stay for a movie. Even if there was no COVID, this would be an awesome place to do it."

A sky view of Sky-Vu Drive-In Theatre in Warren, Minn., as PKM Electric prepares to call its annual business meeting to order on July 14.

Meeting reboot

When Rustad's team received the green light from the PKM board, it was time to plan an entirely new way to celebrate cooperative membership.

"I was thinking, 'How are we going to make this work?' And if this works, we could do it every year," said PKM CEO Mike Schmidt. He added that the co-op had been in a bit of an annual meeting "rut," with the high school serving as the setting year after year.

For the members of many small rural electric cooperatives, the annual meeting is more than business – it's a chance to catch up with neighbors from a few farms over and share a meal with co-op leaders. PKM wanted to ensure that sense of engagement and community continued with any new setup.

"Many of these people live so far out in the country that I don't get to see them on a regular basis," Schmidt said. "I only see them a few times a year, usually at an event like this."

At least 50 PKM members were needed at the meeting to establish a quorum. All sorts of Minnesota-plate-clad cars and trucks started rolling down the entry drive just after 6 p.m., a full half-hour before the gates were to open. A quorum wouldn't be a problem.

"This is just mind-blowing," Schmidt said as dozens of vehicles streamed past the registration tent, where guests were directed to the parking spaces in front of the big screen. By the time the meet-

Mask-clad PKM employees safely handed out goodie bags and registered members as they entered the event.

ing was called to order around 7:15 p.m., 85 members had registered and around 200 attendees had dished up burgers, beans and potato salad.

It was hard to spot many faces (of any age) that weren't smiling at the PKM annual meeting, as guests enjoyed their fill of food, friends and film.

After a short welcome, members were told the rules of voting by car – one honk for a motion, two honks to second a motion and a honk to voice approval or opposition. The president and CEO shared PKM's focus on working safely, maintaining system reliability and using sound financial management.

Woinarowicz took a moment to recognize the years of service of Jeff Folland, a longtime co-op director who had to step down as a board member due to illness. The meeting's peak came as three nominated director candidates (Steve Goodwin, C.J. Peterson and Mike Beaudry) stood before the members and were honked into their new terms.

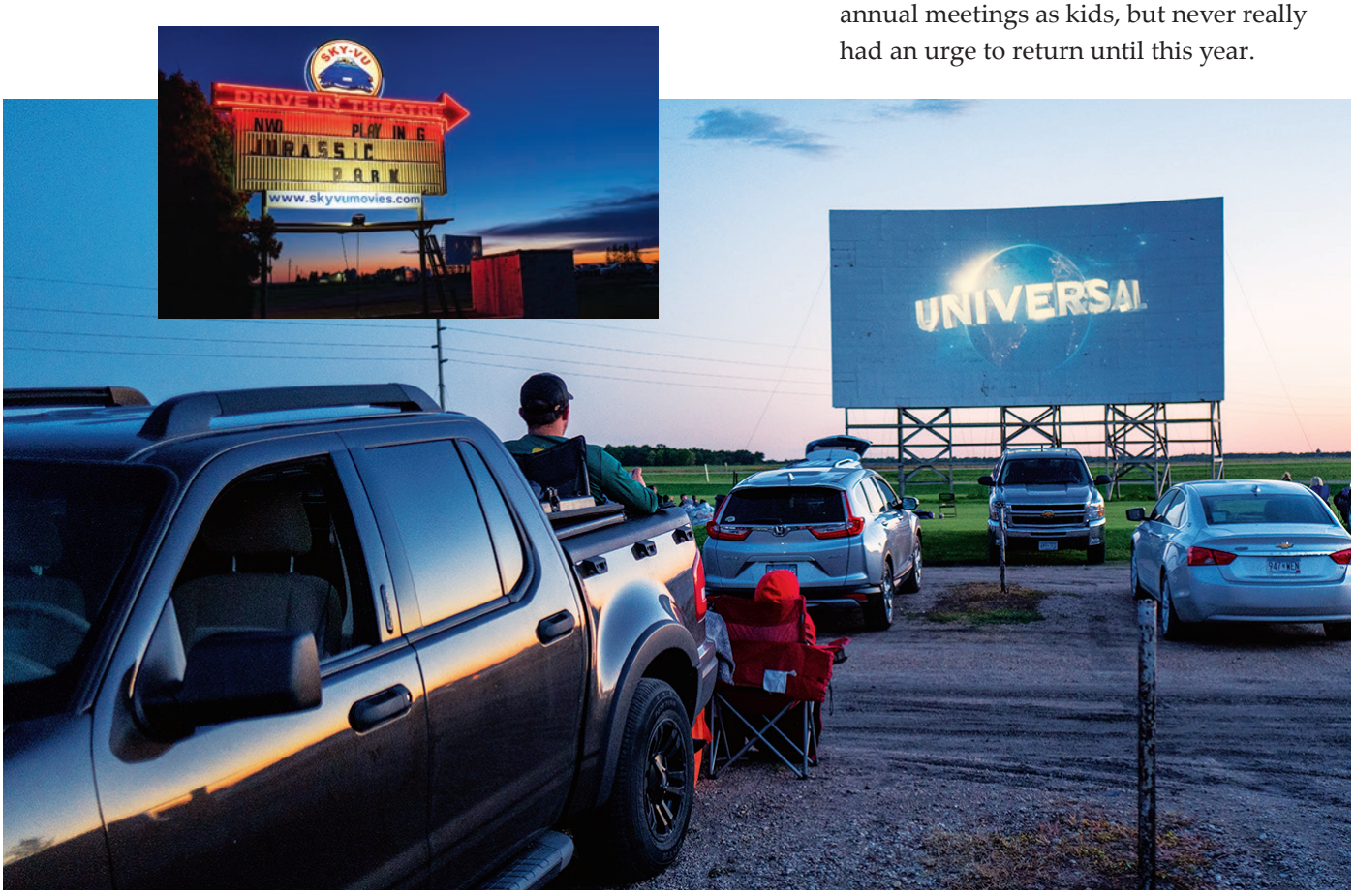
With the meeting's adjournment, Schmidt thanked the PKM staff for its creativity and planning. "We hope you find the meeting to your liking, and we hope you'll stay for the movie," he told the members.

Lemonade out of lemons

Certain industries have experienced a reemergence during a time of social distancing, such as food delivery services, puzzle companies and, of course, drive-in movie theaters. Sky-Vu owner Steve Novak says the drive-in has seen a lot of new business as people try to find ways to connect safely. He's taken inquiries to host graduations, weddings and even funerals.

"Now we have PKM out here for their annual meeting," he said. "Just a lot more opportunities to come out to the drive-in."

The new annual meeting setting sparked interest in people who may not have otherwise marked it on the calendar. Twenty-five-year-old Quentin Pankratz and his sister, Karron, said they remember attending PKM annual meetings as kids, but never really had an urge to return until this year.



When the meeting was adjourned and the sun finally set, PKM members joined other guests for an outdoor showing of the '90s film classic, "Jurassic Park."

"It's important to bring PKM members together, just to ensure our electrical system continues. All the pandemic has done here is give us an excuse to do something unique."

– PKM member Jerome Vanek

PKM members approach the tent to scoop up one of dozens of door prizes awarded after the main meeting – a cooperative tradition.

"We love the drive-in, even though it's an hour away. So we were probably more interested because it was at the drive-in," Quentin said.

Although Shane Dagoberg was born and raised in PKM territory, this was his first annual meeting, with his youngsters Kallie, 7, and Grady, 8, by his side. "It gets people together. And this incorporates what social distancing is about," he said, noting – with a nod to Grady – that the film choice was a bonus. "This one likes dinosaurs."

Cooperative ingenuity

Many cooperatives have moved their annual meetings later in the year, hoping time will diminish COVID-19 concerns. Others have pushed forward, creating virtual meeting experiences to carry out cooperative business.

Cass County Electric Cooperative (CCEC) developed an online portal for its Aug. 25 virtual meeting, complete with prerecorded addresses from leadership and director candidates, a question submission form and more. President and CEO Marshal Albright said the online format allowed the co-op to establish alternative voting methods.

"The change in voting will provide an opportunity for more members to vote," he explained. At previous CCEC annual meetings, 250-300 members would vote for directors. "The new format using absentee and online voting provides the opportunity for over 44,000 members to vote."

Red River Valley Co-op Power also went virtual this year, using YouTube Live to stream its Aug. 5 annual meeting. CEO Rich Whitcomb says the pandemic has forced the co-op to think differently when dealing with adversity.

"I was glad that our by-laws gave us some flexibility to roll with events outside our control," he said. "Flexibility is a good thing during uncertain times, and we are certainly showing flexibility to our membership."

Red River Valley Co-op Power CEO Rich Whitcomb delivers his virtual annual meeting reports from the socially distanced safety of the boardroom.

Whether by movie screen or computer screen, co-op leaders are making sure the pillars of the cooperative – democratic member control, transparency, community – remain strong, even when it feels like the world is weakened.

"It's important to bring PKM members together, just to ensure our electrical system continues," PKM member Jerome Vanek said from the seat of his car. "All the pandemic has done here is give us an excuse to do something unique."

By **Kaylee Cusack** / Photography **Michael Hoeft**

One flight, endless opportunity

MINNKOTA REACHES NEW HEIGHTS WITH LIDAR-BASED SURVEY PROGRAM

A LiDAR-equipped drone hovers near the Park River substation.

Just after lunch on an 85-degree wind-free Tuesday, Seth Simonson found himself in a Park River, N.D. pasture, wiping sweat from his eyes so he could more deftly hopscotch his way around cow pies.

Surprisingly, it wasn't new territory for the vice president and chief operating officer of Precise Sensing, a drone services company out of Fergus Falls, Minn.

Drone pilot Seth Simonson places orange fabric circles around the flight zone to help his GPS-driven LiDAR data pair with the landscape.

"I have been chased before. When you have a big bull hoofing the ground…," he trailed off with a smile.

Simonson was in the process of laying bright orange circles to help calibrate the GPS of his unmanned aerial vehicle (UAV). The DJI M600 Pro drone would fly a LiDAR survey flight over nearly 6 miles of Minnkota 69-kilovolt (kV) power lines that afternoon – one small data-gathering project of many the cooperative has planned with the technology.

LiDAR (Light Detection and Ranging) has emerged as a staple survey method for several industries that need a fast, accurate and (increasingly) cost-effective way to collect detailed information about large land areas and unique structures. Simonson says next to engineering and development, the energy industry is his largest LiDAR client base.

"When it's in the air, the LiDAR is just spinning, sending out a bunch of different lasers," Simonson explained as the LiDAR payload on his drone began to whirl pre-takeoff. "Those lasers will hit and collect

"The amount of information captured in a LiDAR flight is overwhelming sometimes. You honestly have to filter out some points. But to have a 3D model of where things are at just that moment – that's invaluable. It makes you feel confident about any product you're designing."

– Skylar Ertman, Minnkota civil engineer

600-700 thousand points a second. Each laser has its own frequency, so the unit will count how long it takes for the laser to hit the ground and come back."

The technology then uses a speed-of-light formula to determine the distance from the origin to the ground or item the laser hit, while also differentiating if that hit was land, water, a power pole, a building, etc.

"The amount of information captured in a LiDAR flight is overwhelming sometimes. You honestly have to filter out some points," said Skylar Ertman, Minnkota civil engineer for power delivery. "But to have a 3D model of where things are at just that moment – that's invaluable. It makes you feel confident about any product you're designing."

Ertman helped coordinate this drone survey to more accurately assess and design a rebuild of the Mandt-Park River line planned for 2021. It's a small side project of a vigorous LiDAR program Minnkota started in 2019. The program will use a mixture of manned and UAV LiDAR surveys to gather information useful for many areas, including transmission planning, system operations and North American Electric Reliability Corporation (NERC) standards compliance.

Vital for vegetation

One impetus behind Minnkota's most recent LiDAR initiative was the vegetation management program's search for a better way to identify and manage tree trimming work areas.

"LiDAR is an extremely precise surveying tool that is used to collect data points as to 'where in space' our transmission structures and conductor are," explained Brenden LaHaise, Minnkota engineer and vegetation management program lead. "It also detects a variety of other data points, vegetation being one of them."

Minnkota civil engineering manager Wayne Lembke added that his team is able to easily provide vegetation management with information about maximum conductor sag and blowout on lines that have LiDAR and PLS-CADD (Power Line Systems computer-aided design and draft) models available.

"We can look at a specific span and identify if a tree needs to be removed," he said.

Precise Sensing's Seth Simonson (left) prepares his UAV for takeoff as Minnkota civil engineer Skylar Ertman stands by.

"After the initial LiDAR flight and modeling, we can collect vegetation-only LiDAR. We can compare the previous model to the new data and determine vegetation growth or removals that have been completed."

Drone precision

The precision of drone-based LiDAR flights has gone well beyond Minnkota's first manned LiDAR survey back in 2007, when a plane flew the Center-Heskett 230-kV line. Planes must speed over lines and can collect only a few data points in that time. Drones fly slow enough that they can pick up millions of data points, even capturing swinging lines.

During just the first 1,000 feet of Simonson's flight of the Mandt-Park River line, he gathered 30 million points of LiDAR data. Ertman says a ground survey of that same distance would return only 100 points.

"You want to know how close that tree is to that line? Well, from which leaf do you want to know?" Simonson joked as data started to roll into his laptop.

Seth Simonson takes an initial look at the immediate LiDAR data provided by his first flight of the Mandt-Park River line.

Ertman looked over the drone pilot's shoulder to see millions of points forming a 3D cloud of poles, conductor and land. "It's pretty fulfilling when you get stuff like that," he said.

Minnkota engineers receive raw LiDAR data in an XYZ-formatted spreadsheet that uses "feature codes" to determine what each point represents along the line's corridor – 150 feet wide. The engineer brings that data into design software and assigns symbols using those feature codes. The corridor then appears in brilliant 3D, packed with useable, interactive information.

"The benefits are almost endless," Ertman said. "On the engineering front, it's so valuable to us, because we get such a deeply detailed description of what the line corridor looks like. We don't have to assume."

Ertman says the use of LiDAR surveys has given him an extra layer of assurance

What's that in the sky?

A few facts about the UAV used in this story:

- **Model:** DJI Matrice 600 Pro
- **Max speed:** 40 mph
- **Weight:** 22 lbs.
- **Payload:** DSLR camera, inertial measurement unit (IMU), LiDAR sensor
- **Payload weight:** 7-8 lbs.
- **Batteries:** Can fly 18 minutes on a charge
- **Drone cost:** $5,000
- **Entire setup cost:** $170,000

in his designs, as he knows nothing in the corridor will be missed, like a steep riverbank or crossing conductors. "You get ditch bottoms to top of grade on a highway. You know your survey is going to be spot-on," he said.

Future flight

In the past several years, Minnkota has found several ways to innovatively integrate drones into its planning – to increase inspection and survey accuracy, but also to help research the opportunities of the technology. LiDAR has grown into the most valuable of those opportunities, and Ertman believes this is only the beginning of its rise in the industry.

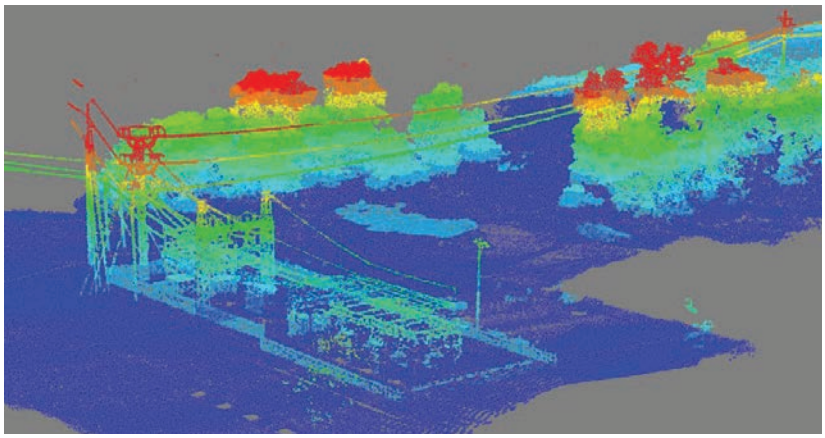
"It's already a standard. If line-of-sight regulations improve, or they figure out more ways to be even more cost-effective with a UAV, it will blow up more than it already has," he said.

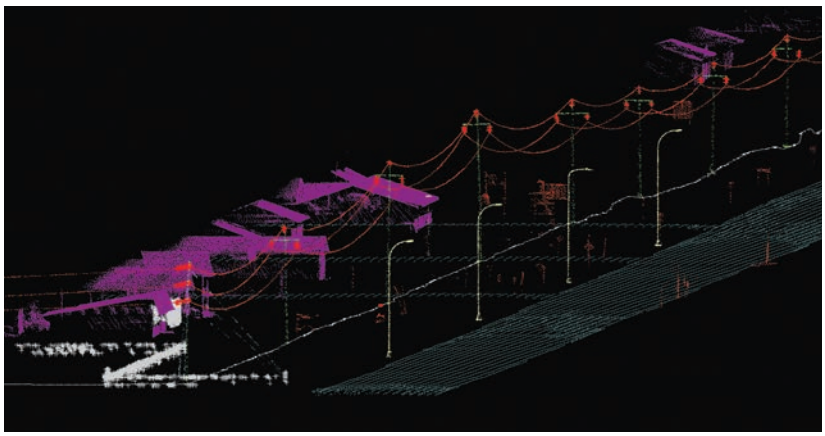
As LiDAR costs decrease, Minnkota will look to incorporate flights even earlier in its planning stages. That proactivity will help the cooperative save money and resources down the road and better plan for the future.

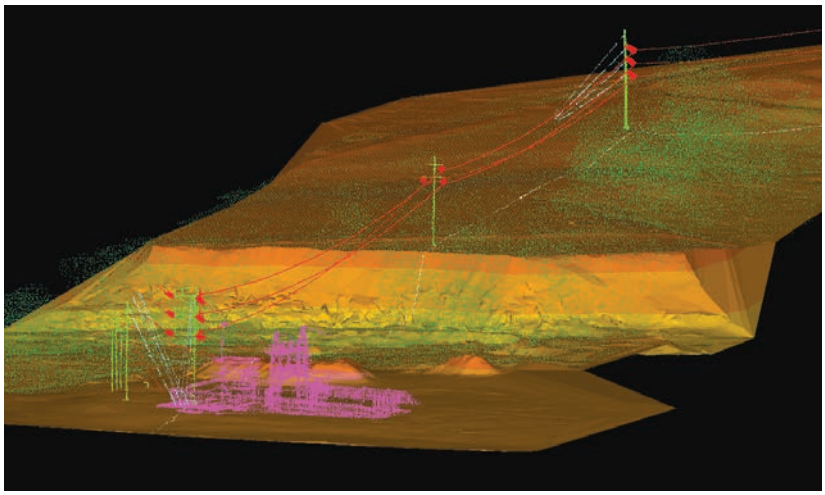
"I see Minnkota continuing to use LiDAR to help prioritize our transmission line rebuild projects," Lembke said. "I also could see using LiDAR to create 3D models of existing substations that may require modifications or expansions."

And for drone pilots like Simonson, the future of LiDAR is worth any obstacle – bovine-based or otherwise – thrown their way. "I enjoy the technology," he said. "It's something that not everyone is doing, and it brings a sense of accomplishment."

By **Kaylee Cusack**







Top: This image shows raw, colorized elevation information collected from the first leg of the Mandt-Park River line LiDAR flight. *Middle:* In this PLS-CADD view of the highway coming into Park River, rooftops, streetlights and roads can all be seen through separately classified points. *Bottom:* The Park River substation is visible through LiDAR points, as well as a TIN (triangulated irregular network) ground surface, which the design software uses to check the clearances of aerial objects.

Resiliency to improve reliability

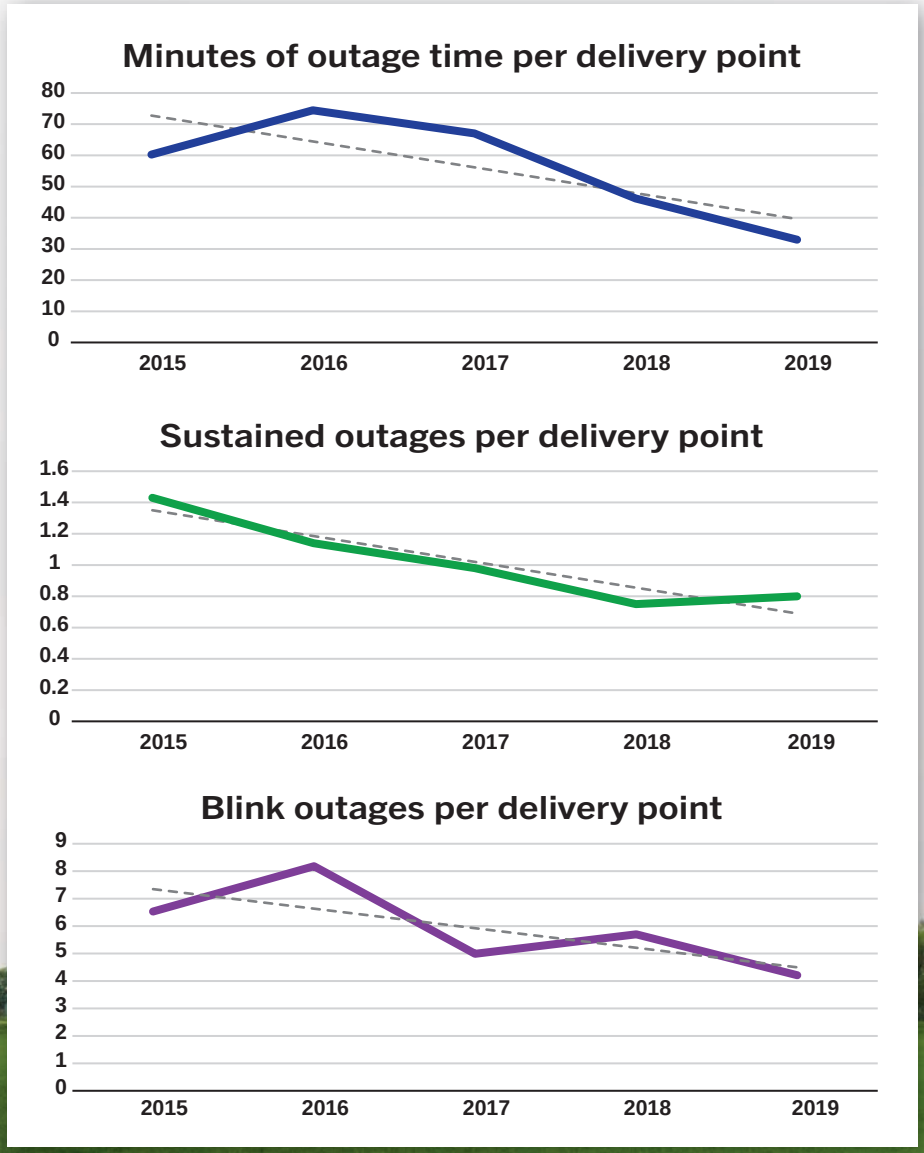
WITH COVID-19 PRECAUTIONS IN PLACE, MINNKOTA CREWS CONTINUE PROJECT WORK

As COVID-19 began to spread throughout the United States, Minnkota's power delivery crews took early action against the spread of the virus. Social distancing among personnel, enhanced sanitization efforts and the use of masks when working in close proximity have all been incorporated to protect the safety and health of the workforce.

Even with the additional requirements and obstacles presented by the pandemic, power delivery progress continues at a brisk pace throughout the summer construction season. Projects to help address aging infrastructure and system reliability have been the focus, as portions of the power delivery system are 60-70 years old.

Aging infrastructure is a focus for most utilities across the nation, and Minnkota is doing its part to make its grid smarter, stronger and more resilient. But with 2,138 miles of 69-kilovolt (kV) transmission line and 212 substations, it's a big job that will take years to tackle. That's why the cooperative is taking a data-driven approach to identifying and prioritizing projects. Advanced analytics are used to help determine if areas of the system should be modified, upgraded or completely rebuilt.

The efforts were prompted by an extensive study of Minnkota's 69-kilovolt (kV) transmission system completed in 2015. Since that time, power delivery metrics – including sustained outages, blink outages and total outage time – are all steadily improving thanks to a wide array of programs to address aging infrastructure, in addition to routine maintenance plans. The following five programs have helped drive recent improvements in reliability.



Crews string wire on a rebuilt section of 69-kV line near Cavalier, N.D.

Blink outage mitigation program

Blink outage mitigation includes adding technologies to existing transmission lines that reduce momentary outages often caused by lightning or wildlife impacts.

2020 focus: Crews have completed about 216 miles of blink outage mitigation.

Outlook: Minnkota is nearing the end of its accelerated plan to address blink outages. About 1,244 miles of 69-kV line have been blink mitigated, which is about 58% of the total system. This program has shown a blink outage reduction rate of 55-60% over non-mitigated circuits.

69-kV transmission line rebuild program

Transmission line rebuild includes disassembling the existing transmission line and building a new line in its place. The new line includes an enhanced design for greater reliability.

Minnkota electrician Jason Sather works to install distribution automation equipment at the Minto substation in eastern North Dakota.

2020 focus: Crews will be rebuilding the Lincoln-Glasston-Hensel line sections in eastern North Dakota (22 miles).

Outlook: By 2022, Minnkota is scheduled to have rebuilt about 95 miles of transmission line, or about 4.4% of the total 69-kV system.

Distribution substation rebuild program

The distribution substation rebuild program includes disassembling the existing substation and building a new one in its place. The new substation includes an enhanced design for greater reliability.

2020 focus: Crews plan to rebuild the Oklee and Rindal substations in northwest Minnesota.

Outlook: Minnkota currently has plans to rebuild about two distribution substations per year.

Distribution automation program

The distribution automation program includes adding new communication technology at existing substation sites, which allows Minnkota personnel to collect, automate, analyze and optimize data. Better system visibility can assist in responding to outages and other issues.

2020 focus: Minnkota plans to complete 15-18 distribution automation projects by the end of the year.

Outlook: At the end of 2020, Minnkota anticipates having 46 substations with distribution automation capabilities. At a rate of approximately 15 substations per year, the cooperative should have all distribution substations equipped with the technology before the end of the decade.

Demand response equipment replacement program

To improve the long-term viability and reliability of Minnkota's demand response program, crews are replacing the ripple injectors at all 17 sites throughout the system.

2020 focus: Ripple injectors and associated equipment at the West Fargo and Wilton substations will be replaced this year.

Outlook: By the end of 2020, Minnkota will have completed work at nine of the 17 demand response sites. The current plan is to have all demand response sites completed by the end of 2024.

By **Ben Fladhammer** / Photography **Michael Hoeft**

Minnkota lineworker Kemnitz receives Lifesaver Award

As an electrical lineworker, Ryan Kemnitz has been trained on how to deal with worst-case scenarios when working around power lines.

That knowledge, along with the courage to stand his ground, likely helped him save lives in July 2019. One year later, Kemnitz is being recognized for his bravery by the North Dakota Safety Council (NDSC) through its prestigious Lifesaver Award. NDSC representatives presented Kemnitz with the award during an Aug. 3 ceremony at Minnkota headquarters in Grand Forks.

Looking back on that day, Kemnitz recalled how an ordinary trip to cover a job in the Bemidji area quickly turned into a life-threatening situation. As he was driving down a busy U.S. Highway 2, he witnessed a bucket truck operator fixing a traffic light accidentally make contact with a power line, which ignited a fireball. The hazardous situation gave Kemnitz an opportunity to use experience from many safety training sessions in a real-life situation.

"What I saw right away was the electrical contact," Kemnitz said. "I knew at that point that I needed to get up to that truck and make sure that guy was OK, and also make sure nobody runs up to help him in case the wires are laying on the truck."

With cars stalled at the stoplight, Kemnitz took the shoulder of the road and drove around to check out the situation. He immediately noticed the power line had snapped and was lying across the road and started a grass fire.

"I turned all my flashing lights on the truck to help divert traffic," Kemnitz said. "I first checked with the guy in the bucket to see if he was OK, which he was. He was on the way back down to recradle the boom. He was fine, but there was a grass fire burning pretty fast underneath the truck."

Kemnitz grabbed a fire extin-

"It's a common misconception that people have is that if the wire is on the ground, it's dead. And that's not true."

– Ryan Kemnitz,
Minnkota area lineworker

guisher from his truck and put out the fire. While Kemnitz was relieved to see the bucket truck operator was safe – thanks to an insulated bucket and boom – danger was still near. The arc flash caused the three-phase distribution power line to burn and fall across the road.

Cars were backed up at the traffic light as Kemnitz and one of the contractors discussed the situation. He asked Kemnitz to move the lines off the road and the two argued. Kemnitz determined that the line was owned by Otter Tail Power Company and that everyone needed to be patient until their crews arrived.

"One of our things is, if it's not your system, you don't work on it; you don't touch it," Kemnitz said. "I told him that wire doesn't belong to the company I work for, so I can't move it. He then wanted to grab my hot stick and move them, but I told him the lines don't belong to you, either."

Kemnitz said the contractor considered grabbing the wires with his gloves or hooking them with a shovel to get them off the road and into the ditch. Knowing that touching the lines likely would result in death or serious injury if energized, Kemnitz held his ground.

Soon fire trucks and ambulances and the Minnesota State Patrol were on the scene. A firefighter asked if the line could be moved and Kemnitz reiterated his position – everybody needed to be patient until Otter Tail arrived.

Once Otter Tail did arrive, the importance of Kemnitz's actions became clear. The Otter Tail employee confirmed that the line was still energized.

"When the Otter Tail guy got there, he put his protective gear on, his gloves and sleeves and had the hot stick," Kemnitz said. "But he still wouldn't move the lines until another guy came to shut the switch off and tell him that it was actually de-energized."

That's the kind of safety mentality it takes when working around power lines.

"It's a common misconception that people have is that if the wire is on the ground, it's dead," Kemnitz said. "And that's not true."

Kemnitz was nominated for the Lifesaver Award by Minnkota's safety and physical security department.

"We felt that it was important to nominate Ryan because a lot of the work that our crews do can go unnoticed," said Travis Jacobson, Minnkota safety and physical security supervisor. "What Ryan did that day likely saved a life. It's pretty clear that someone would have tried to move that line off the road. It would have been a bad day if Ryan hadn't been in the right place at the right time and did the right thing."

Though the incident didn't involve a Minnkota power line, Kemnitz filled out a safety report.

"I did one partly because I used the fire extinguisher in the truck and safety would have asked for one anyway," he said. "But it's also a good thing to document and get out there as a learning tool. The safety department then has a copy of it and can use it if they need to for future training."

By **Ben Fladhammer** / Photography **Michael Hoeft**

Minnkota Power
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The world thinks the North is forever frozen, but these summers get brutal.

Our electricity has to be strong and unyielding, like us, even when the hot sun sets and the wind is still.

That's why we combine the diverse strengths of our region's mighty resources with our steadfast supply of lignite coal – to ensure reliable power on the most blistering days.

Yes, we get scorchers up north, but we stay chill.

Because we're all in on all-of-the-above energy.

ALL IN

ALL-OF-THE-ABOVE ENERGY