Minnkota
MESSENGER

Breaking the ice

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Minnkota
MESSENGER
January-February 2019

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On the cover: Icicles collect on the beard of Brandon Allen, Minnkota field safety specialist.

Coming next issue ...

Minnkota is involved in several major research projects on its generation and transmission systems. We meet the innovators who are taking to the open plains of North Dakota to change the way we think about electricity.

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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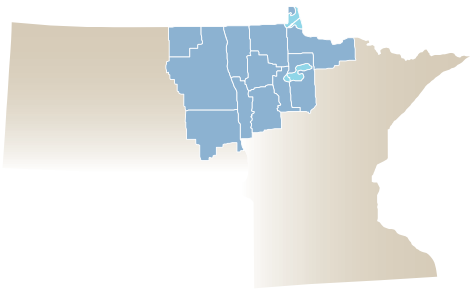


Minnkota Power Cooperative is a generation and transmission cooperative headquartered in Grand Forks, N.D. It supplies wholesale electricity to 11 member-owner distribution cooperatives, three in eastern North Dakota and eight in northwestern Minnesota. Minnkota also serves as operating agent for the Northern Municipal Power Agency, an association of 12 municipal utilities in the same service region. Together, the Joint System serves more than 150,000 customers.

From the editor

For more than 50 years, *Minnkota Messenger* has told the stories that matter most to our membership.

Readers have learned about major energy projects, new technology initiatives and the innovative ways in which our member cooperatives and associated municipals power their local communities. Perhaps more importantly, they've met the people who make it possible. The power plant operator who ensures energy is reliably flowing onto the grid. The line worker who braves the elements to restore power during a storm. And the farmers, business owners and other member-consumers who help our region thrive.

While our website and social media play an important (and growing) role in connecting with you, the *Messenger* is an opportunity to provide a different experience – one that cannot be clicked or swiped away. As inboxes overflow and screen time increases, print is a medium that can cut through the digital clutter and communicate in a more personal way.

In recent months, the Communications staff at Minnkota has worked to reinvigorate the magazine and position it for the future. That means a fresh design, more focused content and a clearer link between the stories in each issue.

So, how's this for an icebreaker? Our first issue of 2019 highlights the effort it takes to power the north. As we prepared to send the magazine to press, wind chills in Minnkota's service area plunged to 60 below zero. When faced with extreme weather, we know our engineers have designed the grid to be durable and our crews have the grit to face even the harshest of conditions. The frigid temperatures are not feared – they are embraced.

Outsiders might see the cold as only an encumbrance, but in many circumstances, it can bring a community together. It's not uncommon to see neighbors help neighbors shovel driveways or passersby stopping to jumpstart a stalled vehicle. In the towns that dot our service area, we're seeing small ice rinks filled with fellowship and spirit as curling has been revived as a wintertime activity alongside hockey and ice fishing.

Winter is an important time for Minnkota and its members. This is the period when the consumers at the end of the line need reliable electricity the most. Keeping the lights on and furnaces running during extreme cold weather events is not something we take lightly. There are innovative systems we use to keep the power flowing across the tundra, but many times it takes someone in a winter coat, gloves and a hardhat to make everything work.

As you page through this issue, we'd love to hear what you think and what content you'd like to read more about. Feel free to reach out to me at bfladhammer@minnkota.com. We're excited for the stories ahead!

Ben Fladhammer
Editor

During the Christmas of 2014, line workers with Cavalier Rural Electric Cooperative (CREC) were pulled away from holiday festivities to clear the power lines after a major ice event. This lineman is using a special rolling device to remove the ice – often a grueling process. *Photo courtesy of Ron Hanson.*

Line freeze expertise

MINNKOTA LEVERAGES ENGINEERING, MUSCLE AND TEAMWORK TO KEEP POWER ON DURING ICE EVENTS

The northeast region of North Dakota is especially prone to ice storms, so sights like this are common for Langdon-area line crews. CREC's Marty Tetrault says they have even buried some lines to avoid the recurring issue. *Photo courtesy of Ron Hanson.*

The timing is never right.

A strange freezing event blows through during Christmas, or Easter, or the linchpin football game of the season – and Mother Nature wears no team's jersey.

"It's the game-winning field goal and the power goes out. It's happened," Minnkota Transmission Superintendent Pat Helling said, recalling just one instance of the frustration that can stem from ice or frost collecting on the power lines.

In Minnkota's corner of the world, ice buildup is a common problem that affects the lines at least a few times every winter. The cooperative's service area, comprising eastern North Dakota and northwestern Minnesota, is home to a climate that boasts wild seasonal swings, especially around December and April.

"It's that perfect mix of temperature and fog and rain and whatever else is going to happen," Helling said. "The line could be basically freezing, and then the air is warm enough to rain. It just sticks."

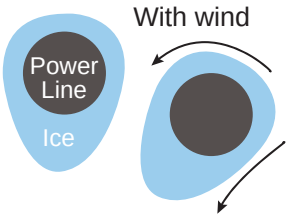
When the ice thickens enough, destruction swings in.

The heavy load on the wires leads to excessive sagging or a much more damaging situation – galloping wires. Minnkota Civil Engineering Manager Wayne Lembke explained that if there is a wind, it will create an ellipse-like ice shape around a normally round conductor, changing its profile.

"It tends to act like an airplane wing," Lembke said. "You get uplift forces because of that, with the wind going over and under the conductor. It will cause it to start lifting."

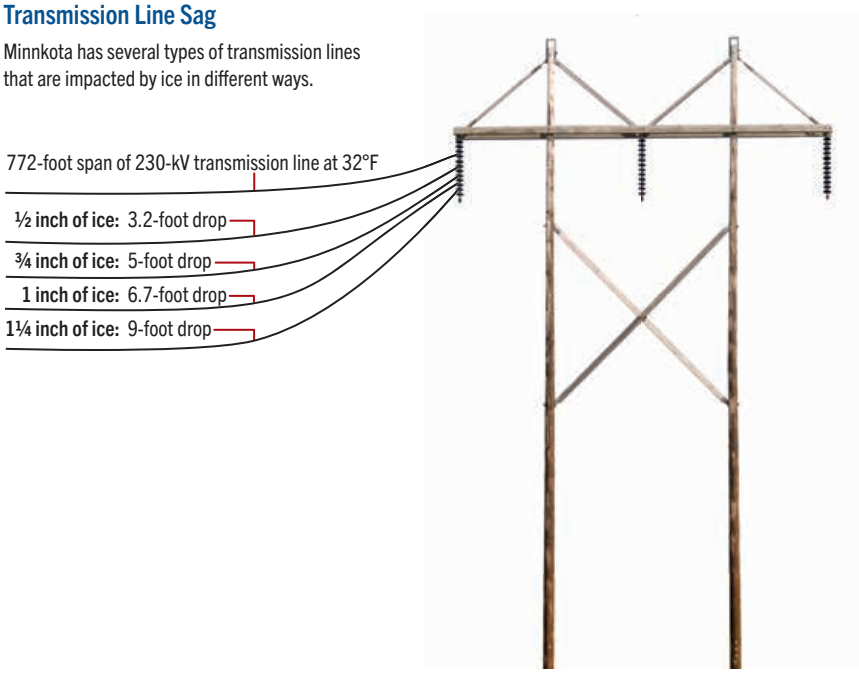
Once the lines get lift, which may only take a 5-mph perpendicular wind, they can

Galloping Aerodynamics



Transmission Line Sag

Minnkota has several types of transmission lines that are impacted by ice in different ways.



begin whipping and sailing in all directions. Galloping wires may slap together and induce a fault on the line, or an arc can cause a line break and a subsequent blink outage. In severe cases, the violent motions cause forces on the structures themselves that can break off post tops or crossarms.

"It's intense, and there's nothing you can do about it when it happens," Helling said. "That's the hardest part to watch – knowing you're pretty helpless."

Speed of destruction

Helling remembered back to Good Friday 2010, when Minnkota experienced one of its worst ice event fallouts on a transmission line north of Bismarck, N.D. He was working as a contractor at the time, but was called to support Minnkota when a semi caught a sagging conductor over the highway.

"It actually tore down the structures on both sides of the road, and then it cascaded both ways," Helling said, pulling up digital photos of the mangled aftermath – three miles of demolished 345-kV line. "We had to take down all of the structures that were damaged and rebuild them new. I think we were out there about two weeks, straight through, until it was done."

The Good Friday storm of 2010 led to the destruction of more than a dozen transmission structures on the Center to Maple River 345-kV line. The cost of repairs was more than $1 million, with substantial support from FEMA. *Photo courtesy of Pat Helling.*

Sometimes the damage isn't so instant. Galloping and vibrations over time can fatigue the conductors and the connecting hardware, shaving years off of the transmission lines and causing premature failures and outages.

"It's weather, and we can't control the weather," Lembke said. "We can only design for what normally happens."

Beating the ice

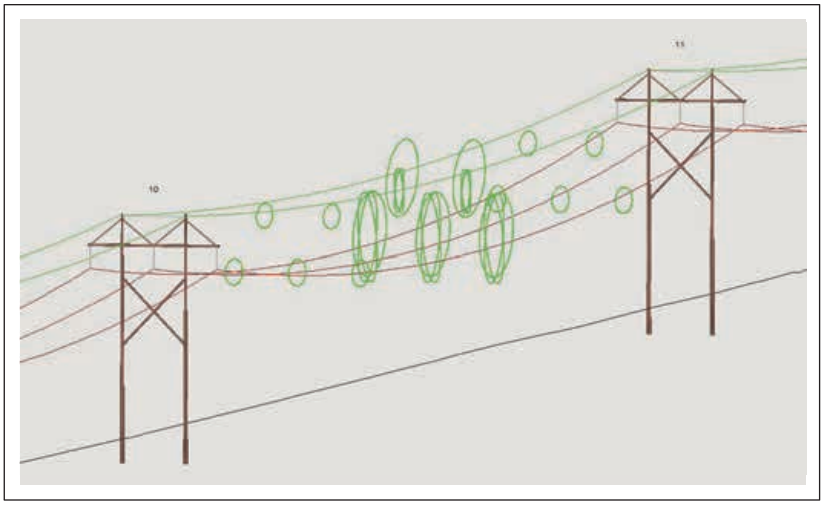
Lembke's engineering team has taken steps to minimize the effects that ice has on the lines. To battle long-term vibrations, the lines are equipped with dampers that either hang from the conductor or spiral around it, absorbing the vibration.

When it comes time to build new, the design element of prevention goes deeper. Minnkota has moved to decreased line spans, increased vertical spacing and wider crossarms to keep the conductors farther apart.

"The older lines were built with 10-foot crossarms – our new standard is 12 foot," Lembke said. "With our design software, we can actually look at the estimated ellipses of the conductor movement and make sure that, when we're designing, those won't be able to come in contact. They didn't have that back in the 1940s and 1950s when we started building our system."

Today, Minnkota follows National Electrical Safety Code guidelines to assure any new line will withstand up to a half-inch of radial ice in a 40-mph wind. If it appears the ice may push the limit without melting away naturally, it's time for Helling to wrangle his team.

Line workers first try to hit the poles with sledgehammers to vibrate the line enough for the ice to break up. If that doesn't work, they harness up for the bucket truck. With an insulated hot stick in hand, they hit the line until the ice falls, moving span-to-span until the problem area is clear.



Minnkota's engineers use special software to visually calculate the amount of gallop their lines can withstand. This image shows the potential gallop loop a line could follow. If the loops indicate the conductors could come in contact, the design is adjusted until there is zero percent overlap.

If a line is deenergized, they can hang a material over the line, connect it to a four-wheeler or snowmobile and drive down the spans, pulling off the ice.

"It's really hard work, and very time consuming," Helling said, adding that he never hears a complaint. "The guys know it needs to be done. We're out there for our members and we're working for the most reliable power we can provide, so it's just part of the job."

Sometimes one crew is not enough. Helling said that on especially tough jobs, Minnkota's member co-ops offer their resources and personnel to assist in clearing ice or repairing damaged lines. Even member-consumers jump in to help the team in any way possible, from providing pickups and ATVs to baking bars for the exhausted linemen.

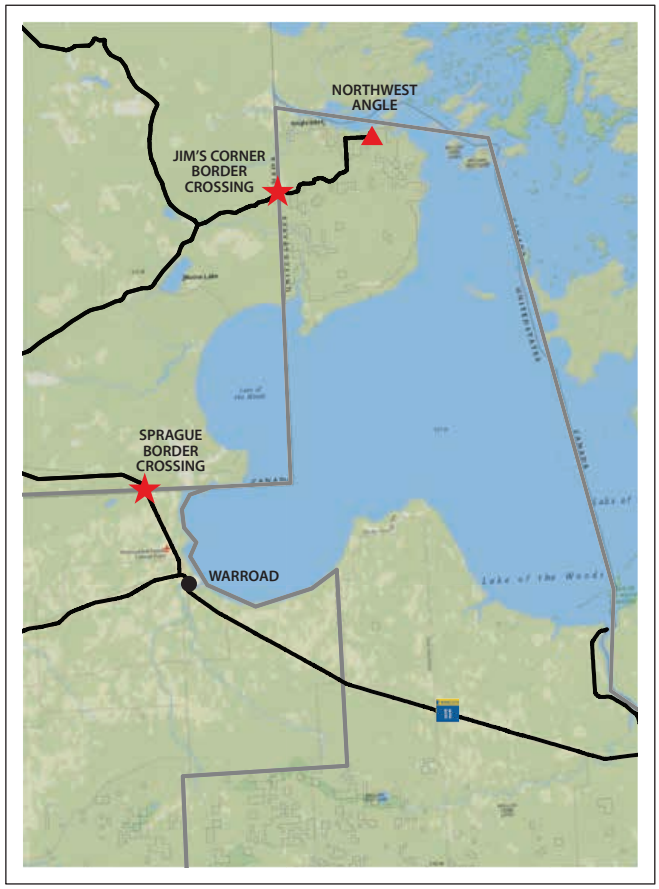
"Our member co-ops have been hugely supportive of us, and we try to do the same for them with anything they need," he said. "We're out there to support them. It's a pretty cool community all together."

Sometimes clearing the lines just takes some muscle, with crews using insulated hot sticks to smash the ice. *Photo courtesy of Ron Hanson.*

By **Kaylee Cusack** / Photography **Submitted Photos**

Working on the beautiful Angle

MINNKOTA CREWS FIND CHALLENGES IN PROVIDING SERVICES TO THE NORTHERNMOST POINT IN THE CONTIGUOUS U.S.



After maneuvering through winding, snow-covered roads, Minnkota's Jason Bjerke was forced to stop at his second border checkpoint in less than an hour. The first one went smoothly – taking just a minute or so to get through Canadian customs.

Farther up the road, Bjerke was in an old shed at a checkpoint called Jim's Corner. Inside was a videophone he used to call U.S. customs officials to tell them he's re-entering the United States at the Northwest Angle.

The customs official told him the videophone is no longer being used. Bjerke was asked to go next door to a newly built shed where an iPad would allow him to check in. The problem was, the iPad wasn't hooked up yet and wouldn't turn on.

After a stop of more than 10 minutes and some back-and-forth with a U.S. customs official on the videophone, the Minnkota technical maintenance technician and his coworker were granted permission to enter the country.

Welcome to life working at the northernmost point in the contiguous United States and the most remote area in the service territory of the 11 Minnkota distribution cooperatives. Bjerke's delay actually wasn't that bad. He had some coworkers go through Jim's Corner the next day, and they were held up 45 minutes because of the new entry system.

Minnkota was busy at the Angle, which is served by member Roseau Electric Cooperative, for a few weeks installing a new ripple control injector at a substation. The new equipment will allow Minnkota to control the electricity load in the area, which is reaching its maximum allowed due to transmission line constraints. As the system nears its capacity, the equipment sends a signal to temporarily control heating systems and other loads.

"The ripple injector installed at the Angle is a little different than any of the others we have on the system," said Nick Gellerman, Minnkota engineer. "It uses a pulse from the meter to calculate the amount of load on the substation, and can send messages automatically without operator input. For the rest of our load control sites, we send out messages manually based mostly on market conditions."

Minnkota and Roseau Electric are making a big investment in the area, with the ripple control injector and new communications equipment. Not only will the upgrade allow Minnkota to shed load with its off-peak program, it will also allow Minnkota to communicate better with the substation from its Grand Forks control center.

Don't forget your tool belt

Employees from both Roseau Electric and Minnkota will tell you that passing through customs actually isn't the biggest obstacle for those who are working at the Angle. The biggest challenge working in the scenic area is the remoteness itself.

This unique part of the country can be reached by motoring several miles through a nature-filled gravel road of tamarack, black

Minnkota's Jason Bjerke calls U.S. customs officials before entering the United States from Canada. Instead of using a telephone, anybody crossing at Jim's Corner now uses an app or an iPad housed in a new shed to gain entry.

Minnkota and Roseau Electric Cooperative employees teamed up to work on the substation upgrade at the Northwest Angle. Crews from both cooperatives worked inside the control houses and outside in frigid temperatures at the substation.

spruce, white and red pine, cedar and birch. While enjoying the majestic trees, one has to be mindful of the many mammals that can pop out at any moment.

Spectacular scenery, for sure, but you leave conveniences behind.

"If you have a problem, there's no place to go to get help," said Mike Vetsch, Minnkota senior electrician. "There's no hardware stores, no anything. So if you're missing material, you're pretty much out of luck."

Vetsch said he almost ran out of diesel fuel for his truck one time at the Angle. None of the resorts carry the fuel. The closest place he could find was in Sprague, Man., which is nearly 40 miles from Minnkota's Northwest Angle substation.

For a good selection of hardware materials, you must travel 60 miles back across the border on a mix of gravel and pavement to either Warroad or Roseau.

Roseau Electric gets up to the Angle a lot more than Minnkota. Ross Nelson, a Roseau Electric lineman who helped with the ripple injector project, said being in the remote area requires more planning of materials before leaving the co-op.

"You forget one item and it sets you back a half a day of work sometimes," Nelson said.

Partnership to serve

Because the Angle is a 3½-hour drive from Minnkota's corporate campus in Grand Forks, Minnkota and Roseau made an arrangement in which Roseau built the new control house for the ripple injector, did the dirt work, installed piping and ran the wires for the project.

Justin Olson also was part of the Roseau crew working at the Angle. He couldn't

A new control house (right) was built to store the demand response ripple control equipment at the Angle.

have been more pleased. He has a cabin about 2 miles from the substation.

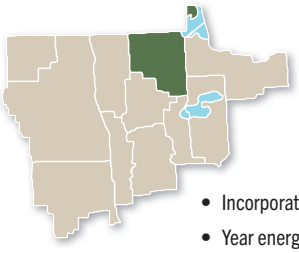
"It's different up here from working at home," Olson said. "You drive a barge, you boat around. It's scenic. When you're working up here, it doesn't really feel like you're working. But this is the most remote area we serve."

Olson said it's a lot easier working at the Angle today than it was back in the day.

Technology is the biggest reason. When he has a problem or a question, he can email or send a text with a photo to describe the situation to a Roseau coworker. When he had trouble installing a threshold on the new control house door, he just emailed a Minnkota employee.

It turned out to be the wrong threshold. Minnkota sent the correct one with a crew already scheduled to travel to the Angle for work the next day.

Bjerke said he's used to working in remote areas of Minnesota.



Served by

Roseau Electric Cooperative

Roseau, Minn.

- Incorporated – July 25, 1940
- Year energized – 1944
- Board members – 9
- General manager – Tracey Stoll
- 2017 members: 6,450
- Miles of line – 2,194
- Fun fact – Roseau Electric is in the early stages of planning a rural broadband project in its service area.

"We're always traveling and going to substations that are in the middle of nowhere," he said. "The border isn't a big issue. When we have a Minnkota sticker on the side of our truck, they kind of know we're up here for a reason."

By **Kevin Fee** / Photography **Kevin Jeffrey**

A hot ice sport

AREA CURLING SEES UPTICK AFTER 2018 U.S. GOLD MEDAL

When the curling club in Stephen was built in the 1960s, plans called for a grain storage facility as a backup if the sport didn't catch on in the northwest Minnesota town.

"It's been going strong ever since," said Dick Dolan, who has played in every bonspiel Stephen has offered over the years. "In fact, it's going stronger than ever."

That seems to be a common refrain from curling clubs around the country. Other ice sports such as fishing and hockey are popular in the Red River Valley, but curling received an immense boost from the United States men's gold-medal win in the 2018 Olympics and its return to an official Olympic sport in 1998.

Minnesotan and skip John Shuster led the U.S. team to the title, defeating Canada twice before knocking off Sweden in the final.

The Americans had never won a gold medal in the sport. For that reason and more, members of the team expressed hope that curling would become more than a cultural curiosity every four years. For sure, they didn't want the pebbled curling ice replaced by storage of any commodity.

"We want our sport to be loved by our country as much as we love it," Tyler George, a member of the Shuster team, told The New York Times after the Olympics. "There's a reason why we play it, and there's a reason why we love it as much as we do."

The sport is a hit in Grafton, Thief River Falls and Stephen, all of which receive their electricity from the Northern Municipal Power Agency. Minnkota is the operating agent for NMPA, which is located in Thief River Falls.

"The Olympics got everybody watching it," said Krist Olson, who maintains the curling ice in Thief River Falls. "It was a big win for Team USA. It's a pretty big deal to beat Sweden and Canada. It's kind of unheard of."

In Stephen, officials have even revived the club's Farmers League, which is going strong on Wednesday afternoons. The other adult league is on Thursdays.

Between the two days, Stephen has 24 teams competing. It also hosts youth events and high school students at the rink.

"We just started youth curling at the end of last year," veteran Stephen curler Dan Riley said. "We saw 30 to 40 kids show up for three Sundays in a row. We plan to do that twice a month this year. I've heard rumors the Minnesota State High School League may make curling a sanctioned sport. If so, I think it would be great to get a Stephen-Argyle Central team and other high schools in the area involved.

"We were very close to closing our doors in the early '90s due to lack of membership and funds. Living in a small ag community, our club thrives and declines with the state of agriculture. We've been very fortunate

Curlers compete in a Farmers League at the Stephen Curling Club recently.

Above: A Stephen curler lets go of his rock as teammates sweep ahead of him.

Far left: Dan Ridley tells one of his teammates where to aim the rock at the Stephen Curling Club.

Left: The Stephen club remodeled the ice area and the upstairs of its building recently. More renovations are planned.

Served by

Northern Municipal Power Agency

Thief River Falls, Minn.

- Headquarters: Thief River Falls, Minn.
- Year founded: 1976.
- Participants: Bagley, Minn.; Baudette, Minn.; Fosston, Minn.; Grafton, N.D.; Halstad, Minn.; Hawley, Minn.; Park River, N.D.; Roseau, Minn.; Stephen, Minn.; Thief River Falls, Minn.; Warren, Minn.; Warroad, Minn.
- Minnkota is the operating agent for NMPA
- Consumer accounts: More than 15,000

there's been multiple young people and families, working in agribusiness and farming, who have moved back home in the past few years."

Thief River Falls has had similar growth.

"We are definitely in a growing phase in our club," said Tony Gilbert, Thief River Falls club president. "Three years ago we finally recreated a board of voting members to help make decisions on club direction. With this board many positive steps have been made to increase visibility of our club in the community, as well as the youth.

"Every year, the high school has a four-week elective class where they come over and we have members teach them how to curl. We also started a four-week youth program last year in which we had a dozen kids under 12 come out and try the game."

Better than half of the Thief River Falls curlers work for Digi-Key, a large electronic components company headquartered in the city. Digi-Key has an in-ice logo in the middle of the rink and helps pay for its employees' membership in the club.

Former Warren attorney Brian Rokke has been curling for several years. He's one of about 100 members in the Thief River Falls club.

"It's a good thing to do in the winter for those who can't skate," he said.

The city owns the curling building in Thief River Falls. The club is working with the city on a new long-term lease. Once the lease is in place, the club and the city plan to make improvements.

It appears to be a smart investment. Prior to reinstatement as an Olympic sport in 1998, curling had been a niche sport in the United States. Due to nationwide exposure through

"I've heard rumors the Minnesota State High School League may make curling a sanctioned sport. If so, I think it would be great to get a Stephen-Argyle Central team and other high schools in the area involved."

– Stephen curler Dan Riley

Krist Olson prepares the ice at Thief River Falls before league play begins. Olson is the primary ice maker at the club.

Olympic television coverage, curling has expanded rapidly. In 2016, membership in the U.S. Curling Association (USCA) topped 20,000 for the first time.

In 2011, the North Dakota region reported 1,041 members to USA Curling, and Minnesota reported 2,925. Their combined total was 3,966 out of 16,545, which was 22.4 percent of all reported curlers. As of Jan. 31, 2018, the Dakotas region reported 1,700 curlers, and Minnesota reported 5,662. Their combined total is 7,368 of 22,690, which is 32.5 percent of all reported curlers.

Grafton might not be growing as much as the Minnesota towns, but it has a long and successful curling history. The club has had U.S. men's national champions in 1960 (Orvil Gilleshammer) and in 1972 (Robert LaBonte). The LaBonte rink lost to Canada for the world championship gold medal in 1972 after a fluke kick of a rock in the 10th end, taking away an apparent U.S. victory. Canada went on to win in an extra end.

Al Presteng, a veteran Grafton curler, said the club is holding its own. There are a combined 24 men's and women's teams playing.

Grafton, Stephen and Thief River Falls all have tournaments, which are referred to as bonspiels in curling. Grafton held a bonspiel in January that paid out several thousand dollars in cash prizes. Stephen is looking forward to its event. On Jan. 10 it posted on Facebook that it had already reached its limit of teams and others interested would be placed on a waiting list for the Feb. 21-24 bonspiel.

Stephen's bonspiel is the town's big event during the winter season, the unofficial winterfest. In addition to curling on Stephen's three ice sheets, the American Legion hosts a steak fry, the Community Center hosts a senior class breakfast fundraiser and a vintage snowmobile run is held.

"In 2006 we were unable to have a bonspiel due to lack of interest," Riley said. "In our 52-year history, that is the only year we didn't have a bonspiel. There were a core group of committed members who decided to really try make our bonspiel an event. Ever since 2007 it has grown to the point to where we are full."

By **Kevin Fee** / Photography **Kevin Jeffrey**

The Game

- A game is normally made up of eight ends (like innings). An end consists of each team member shooting (delivering) two rocks, or stones, alternately with the opponent's player at the same position. When all 16 rocks have been delivered, the score for that end is determined.
- A 12-foot circle (the "house") is the scoring area. For each stone closer to the center of the circles (the tee) than any of the opponent's, one point is scored. The team scoring shoots first in the next end, giving the opponent the "hammer," or last shot of that end.
- The sheet of ice (playing surface) is 16 feet, 5 inches wide and 150 feet long, set up to accommodate play in both directions.
- All four players shoot two rocks per end, beginning with the player referred to as the "lead." The "second" shoots next, and then the "third," or "vice skip." The skip usually shoots the last rocks, and calls the strategy for the game.
- Sweeping – with synthetic heads – adds the element of fitness to curling because, to be effective, sweeping must be very vigorous. Sweeping slightly melts the ice, which reduces the friction between the running stone and the ice. The result is that the stone will curl less, and slide farther.
- Strategy is a major part of curling. Shots are played with an eye to the last rocks of each end, not simply placed at the center of the circles.

This 50-foot platform offers the height and water's-edge location that is attractive to nesting ospreys. The black wrap will prevent predators from snatching eggs.

Raise the roost

MINNKOTA, LANDOWNERS AND DNR WORK TOGETHER TO PROVIDE SAFE, ALTERNATIVE HOME FOR OSPREYS

When Pam and Kevin Greenwaldt chose a spot for their new home five years ago, they picked a breathtaking one – just a few miles north of Bemidji, nestled next to a charming little lake and a smattering of neighboring homes.

One of those homes stood out from the others, out in the middle of the lake, high above the water, constructed from sticks and grasses.

Pam Greenwaldt

The transmission power line tenants became a part of the Greenwaldt family.

"They're our birds," Pam said of the nest-dwelling ospreys currently taking their migratory vacation farther south. "When we first moved here and started building, a woman down the street told us they would never come back, the ospreys. But they did!"

Like a mother hen herself, Pam started to worry about the safety of the birds. "Whenever I see the birds land in there, I say to myself, 'Please don't hit, please don't hit!' Because the nest was getting so big."

Minnkota anticipated additional problems with the birds' precarious roost and decided to work with the Greenwaldts to provide a new nesting platform that would both keep the birds safe and prevent any power issues the massive nest could cause.

On Jan. 3, the Minnkota crew installed a 50-foot pole with a 4-foot square aluminum platform in the Greenwaldts' backyard, right along the lake's edge and just 200 feet from the nest's initial location. The original nest will be removed from the power line.

"We'll take some sticks off of the nest and put them on that platform to try and entice the osprey to nest there this spring," said Minnkota area line worker Vern Peterson, who has been working on a relocation plan with Pam and Kevin since the summer. "We've done that in the past, and that's worked. We want to get them to keep nesting here – just not on our power lines."

Ospreys have made a home of this platform constructed by Minnkota in 2015 near Bemidji. Minnesota DNR's Christine Herwig says the nest has produced chicks for the past couple of years.

A Minnesota home

A project like this is unique to certain areas of the country – os-

preys are particular about where they raise their families. In Minnkota's service area, they are mostly found in central and northeast Minnesota, where they have access to a bounty of lakes and rivers in which to grab fish just under the surface. Unfortunately, their fondness for high perches around water makes power lines perfect osprey real estate.

Minnesota Department of Natural Resources' (DNR) Christine Herwig explained that ospreys are federally protected as migratory birds and that the DNR requires power companies to obtain a permit and only move or remove a nest between October and April, when the birds fly south.

"Lakes and rivers freeze up and they don't have access to fish anymore," Herwig said. "We don't want to disturb nesting birds. We don't want to keep them from successfully hatching and fledging chicks."

Installing a platform during the cold winter months presents some challenges but ultimately works in the crew's favor. The frosty, snow-covered ground can make digging the 8-foot hole for the platform harder, but a frozen lake allows crews to easily access the power line structure to remove the old nest, either by climbing the pole or, if the ice is thick enough, by truck.

Simply raising the nesting platform isn't enough. The team also wraps the platform pole with a slippery black material to protect it from woodpeckers, squirrels and other nuisances. To keep ospreys from trying to nest on the line's crossarm again, they install a plastic, cone-shaped deterrent on which the birds are unable to build.

If this nest were to remain on the line and grow, or another was built in its place, it could eventually trip the line or start a fire. However, this project is about more than power.

"It's not necessarily always destructive on our end. This is more to protect the osprey and to make sure they don't get zapped," said Butch Tester, Minnkota transmission crew foreman.

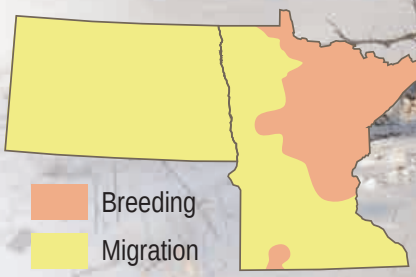
"It's a win-win situation," Herwig added. "If you can put up an alternate platform, that's good for the birds – they have a place to go – and it's good for the power company, because the structure that they're trying to protect can be safe and provide reliable energy."

This isn't the first time Minnkota has raised an osprey platform in the area. By working closely with DNR experts, these platforms have supported many successful relocations. In a 2014 case, a Bemidji High School class was pulled into the process as an educational experience.

Back in the Greenwaldts' lakeside yard, Tester's team had the pole wrapped, placed and fortified in no time at all, as an eager Pam watched from the sideline and envisioned her adopted osprey family even closer to home.

"I just hope they will take to it," she smiled.

By **Kaylee Cusack** / Photography **Kevin Jeffrey**



Source: **birdsna.org**

Flight facts

- Ospreys may add more material to their nests every season – some reach up to 10 feet high.
- Ospreys can dive up to 3 feet underwater to capture a fish.
- Ospreys have a rotating talon that allows them to turn a fish midair for better aerodynamics.

Q&A

Brendan Kennelly
Senior Manager
Power Delivery Engineering

Minnkota Power Cooperative entered 2019 with an ambitious set of projects aimed at building a stronger, more resilient power delivery system.

New transmission lines, new substations and improvements to existing infrastructure are all part of the cooperative's annual capital budget, which was approved by the Board of Directors in November. About 85 percent of the $48.6 million budget is designated for power delivery projects, tools and equipment.

Brendan Kennelly, senior manager of power delivery engineering, helps break down the upcoming year.

How are power delivery projects initiated and prioritized?

There are a number of factors we focus on when evaluating projects. As a part of the Power Delivery division's P5 initiative, we have developed a portfolio management process that follows each project from initiation to closeout. There is a set of criteria within P5 that covers things such as reliability, economics, safety and regulatory issues. All of those items are added up and scored, and that's how projects are developed and prioritized. Each year we present our five-year construction expenditure forecast and capital budget to our board for consideration.

What are some of the key needs being addressed in this year's power delivery budget?

In 2019, we'll see a continued focus on our aging infrastructure and service improvements. We're addressing infrastructure that was built in the 1940s, '50s and '60s that is coming to the end of its useful life. That includes reconductor work (installing new wires) on the 69-kV system, blink outage mitigation and rebuilding distribution substations – all projects that help improve service to our members.

What are some of the noteworthy projects of which our members should be aware?

Blink outage mitigation continues to be a very focused project for all of the Power Delivery staff. We have completed work on about 800 miles of our 69-kV system so far, and we have another 200 miles planned for this year through the central part of our system. We have projects by Warsaw, N.D., Thief River Falls, Minn., Winger, Minn., and Bemidji, Minn. At the end of 2019, we'll have blink mitigated about half of our 69-kV system, which is a significant accomplishment. We will continue reconductor work and we also have a pretty significant line rebuild project near Roseau, Minn.

Two distribution substations are on our list to be rebuilt this year – one near Litchville, N.D., and another just west of Fargo at our Warren substation. We also have plans to build a new distribution substation to support load growth in south Grand Forks.

Upgrades to our demand response system will also continue, as we replace our ripple injector fleet at the substations after 30-40 years of service. We have a project in Valley City and another up by Baudette at our Lund substation.

Reducing blink outages has been a focus for the Power Delivery division in the last few years. Have we seen a reduction in these momentary power outages?

We've been pleasantly surprised with our results so far. We did an analysis during 2018 and compared how blink mitigated circuits performed compared to non-blink mitigated circuits that have not been touched. We've seen almost 50 percent reduction in the number of blink outages on the lines we've addressed. That was very good feedback on a program we've put a lot of time and effort into and one that is important to our members. We're pretty happy to see that level of improvement.

What does our five-year forecast look like for power delivery projects?

In recent years, Power Delivery's capital budgets have been higher than historical averages. We anticipate that to decrease slightly and become more stable, in the $30-40 million range. Our plans are to continue focusing on aging infrastructure and service improvement. We focused a lot on our high-voltage grid in the early 2010s with the completion of the Center to Grand Forks transmission line project and the Bemidji to Grand Rapids line – two of the largest projects in Minnkota's history. Now we're coming back to focus on our distribution substations and our subtransmission system that are a little more visible to our members and their consumers.

Burgum lauds Project Tundra

Photo courtesy of Governor's office

During his State of the State address in January, North Dakota Gov. Doug Burgum said he is impressed with work being done on Project Tundra.

Project Tundra is the research and development activity through which Minnkota is evaluating carbon capture technology for retrofitting the Milton R. Young Station. With Project Tundra, Minnkota – partnering with Eagle Energy Partners, BNI Energy and the Energy & Environmental Research Center (EERC) – is exploring a retrofit for Unit 2 of the Young Station, featuring technology that would capture up to 95 percent of its CO_2 emissions.

The CO_2 would then be used for enhanced oil recovery or permanent geologic storage. Project Tundra work is patterned after comparable work done at the Petra Nova project, a carbon capture technology being used at a coal power plant in Texas.

"Our lignite industry continues to innovate and invest, providing essential baseload electricity to the grid despite long-term economic and regulatory uncertainty created by overreaching federal policy in the previous administration," Burgum said during his address.

"Project Tundra, which aims to capture carbon dioxide that can be used to revitalize old oil wells, was recently awarded the largest grant in the history of the Lignite Research Council, $15 million. This partnership between the Energy and Environmental Research Center at UND, lignite and the oil and gas industry is transforming power plant emissions to a marketable, value-added commodity."

Strong year for energy sales

Increased demand for energy in the summer and fall months helped push Minnkota's 2018 energy sales ahead of budget.

The 11 Minnkota member cooperatives sold 1.4 percent more energy than had been budgeted for during the year. Warm summer weather and a quick cool-down in the fall helped produce record sales months in May, June, July, August, October and November. Each member showed an increase in annual sales compared to 2017.

December energy sales, however, were about 4.3 percent below budget, primarily due to warmer-than-average temperatures.

The 12 participant cities in the Northern Municipal Power Agency (NMPA) recorded a 0.6 percent increase in energy sales compared to budget. All but one of the participants had increased energy sales compared to 2017.

Minnkota is operating agent for NMPA.

Giving Back to the Community

Employees give to food pantry

Minnkota's Grand Forks employees have donated $250 to the Larimore Food Pantry.

Minnkota's Julie Daws, operations assistant, presented the check to JoAnn Knudson on behalf of employees on Dec. 29. The money comes from the Jeans Day account.

"Thank you for the donation of $250 to the Food Pantry in Larimore," Knudson said. "We strive to help those in need of food in the community. Your support is greatly appreciated."

Employees also are giving $250 to the North Dakota Museum of Art for its Solstice community-driven art exhibition, which ran Dec. 21-Jan. 18. Students make Solstice trees from thousands of paper plates.

Since 2011, Grand Forks employees have given nearly $44,000 to charities through the Jeans Day program.

JoAnn Knudson, left, Larimore Food Pantry, accepts a check from Minnkota's Julie Daws.

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APRIL 5, 2019

Minnkota, Square Butte to hold annual meetings

Minnkota Power Cooperative and Square Butte Electric Cooperative will host their annual meetings on April 5 at the Minnkota Power Cooperative campus in Grand Forks.

While Minnkota hosts its 79th annual meeting, Square Butte will host its 45th annual meeting.

At the meetings, reports on operations and year-end results will be presented, along with planned generation and transmission projects. Other business will include the election of directors and adoption of policy resolutions on issues of importance to Minnkota and Square Butte.

Registration begins at 7:30 a.m. The two meetings will begin at 8:30 a.m., with Minnkota Chairman Collin Jensen, Roseau, Minn., and Square Butte President Mark Habedank, Twin Valley, Minn., presiding.

A membership social will be held on Thursday, April 4, at 5:30 p.m., at the Minnkota campus, which is located at 5301 32nd Avenue South in Grand Forks.

Minnkota's 11 member distribution cooperatives supply electricity to about 137,000 consumers in a 35,000-square-mile area. Square Butte owns Unit 2 at the Milton R. Young Station and is governed by the cooperatives associated with Minnkota.