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April 3, 2022

VIA E-FILING

Will Seuffert
Executive Secretary
Minnesota Public Utilities Commission
121 7th Place East, Suite 350
St. Paul, MN 55101-2147

**Re: In the Matter of Minnesota Power's 2022 Safety,
Reliability and Service Quality Standards Report
Docket No. E015/M-23-75**

Dear Mr. Seuffert:

Minnesota Power (or the "Company") submits its annual Safety, Reliability and Service Quality Standards Report ("Report") to the Minnesota Public Utilities Commission ("Commission") in accordance with Minn. Rule 7826 - ELECTRIC UTILITY STANDARDS, and relevant Commission-issued orders. This Report covers Minnesota Power's safety, reliability and service quality for 2022 and its corresponding reliability results. Through this Report, Minnesota Power details the Company's efforts and commitment to provide safe, reliable and affordable electric service to its unique customer base in northeastern and central Minnesota.

Please contact me at (218) 355-3082 or cvatalaro@allete.com if you have any questions regarding this filing.

Yours truly,

A handwritten signature in cursive script that reads 'Claire Vatalaro'.

Claire Rajala Vatalaro
Regulatory Compliance Specialist

CRV:th
Attach.

I AM
ZERO INJURY.

*Together we choose to work safely for our families, each other, and the public.
We commit to be injury-free through continuous learning and improvement.*

**STATE OF MINNESOTA
BEFORE THE
MINNESOTA PUBLIC UTILITIES COMMISSION**

In the Matter of Minnesota Power’s 2022 Safety,
Reliability and Service Quality Standards
Report in Accordance with Minn. Rule 7826

Docket No. E015/M-23-75
2022 SRSQ REPORT

Summary of Filing

Minnesota Power (or the “Company”) respectfully submits its annual Safety, Reliability and Service Quality (“SRSQ”) Report (“Report”) to the Minnesota Public Utilities Commission (“Commission”) in accordance with Minnesota Rules Chapter 7826 - ELECTRIC UTILITY STANDARDS, and relevant Commission-issued orders, including the Commission’s November 9, 2022 and January 18, 2023 orders in the Company’s 2021 SRSQ (Docket No. E15/M-22-163). Through this Report, Minnesota Power provides the Commission, Department of Commerce - Division of Energy Resources (“Department”) and other stakeholders information detailing the Company’s efforts and commitment to providing safe, reliable and affordable electric service to its unique customer base.

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**STATE OF MINNESOTA
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Reliability and Service Quality Standards
Report in Accordance with Minn. Rule 7826

Docket No. E015/M-23-75
2022 SRSQ REPORT

I. Introduction

Minnesota Power (or the “Company”) respectfully submits its seventeenth annual Safety, Reliability and Service Quality (“SRSQ”) Report (“Report”) to the Minnesota Public Utilities Commission (“Commission”) in accordance with Minn. Rule 7826 - ELECTRIC UTILITY STANDARDS, and relevant Commission-issued orders, including the Commission’s November 9, 2022 and January 18, 2023 orders in the Company’s 2021 SRSQ (Docket No. E15/M-22-163). Through this Report, Minnesota Power provides the Commission, Department of Commerce-Division of Energy Resources (“Department”) and other stakeholders information detailing the Company’s efforts and commitment to provide safe, reliable and affordable electric service to its unique customer base. Minnesota Power is proud to have provided over 99 percent reliable power for its customers in 2022 and reports, by both Company wide and by work center, on how it performed compared to peer utilities. As described in this report, Minnesota Power continues to initiate a number of efforts to improve reliability, including strategic undergrounding, grid modernization, and asset maintenance and renewal programs.

Throughout 2022, Minnesota Power experienced similar challenges as others in the industry – including supply chain disruptions and workforce shortages. Therefore, the Company was challenged in meeting some of the metrics in this report, including call response times, the CAIDI goal in the Northern Work Center, and the SAIFI goal in the Western work center. However, the Company’s Customer Care and Support Representatives spent the necessary time on customer calls discussing payment agreement options and assistance programs as Minnesota utilities returned to normal operations after the COVID-19 pandemic.

In addition to ensuring reliability of its system and caring for its customers, Minnesota Power is also dedicated to helping communities and fellow utilities as they endure natural

disaster-related outages. Minnesota Power looks forward to continuing its commitment to Customers, Communities and the Climate in executing its Energy**Forward** strategy towards a carbon-free future.

A. Procedure and Authority

Minnesota Power is submitting this Report in accordance with Minn. Rules 7826.0400, 7826.0500, 7826.0600, subp. 1, and 7826.1300, 7820.0500 and in compliance with Commission rules and orders relating to annual filings associated with Minnesota Power's Safety, Reliability, Service Quality and proposed reliability results. The Company provides the following required general filing information.

1. Name, Address, and Telephone Number of Utility
(Minn. Rule 7829.1300, subp. 3(A))

Minnesota Power
30 West Superior Street
Duluth, MN 55802
(218) 722-2641

2. Name, Address, and Telephone Number of Utility Attorney
(Minn. Rule 7829.1300, subp. 3(B))

Matthew Brodin
Senior Attorney
ALLETE
30 West Superior Street
Duluth, MN 55802
(218) 355-3152
mbrodin@allete.com

3. Date of Filing and Date Proposed Changes Take Effect
(Minn. Rule 7829.1300, subp. 3(C))

This petition is being filed on April 3, 2023. Until Commission approval, the existing reliability results will remain in effect.

4. Statute Controlling Schedule for Processing the Petition
(Minn. Rule 7829.1300, subp. 3(D))

This petition is made pursuant to Minnesota Rules 7826.0400, 7826.0500, 7826.0600, subp. 1, and 7826.1300.

Furthermore, Minnesota Power's request for approval of its proposed reliability results falls within the definition of a "Miscellaneous Tariff Filing" under Minn. Rules 7829.0100, subp. 11 and 7829.1400, subp. 1 and 4 permitting comments in response to a miscellaneous filing to be filed within 30 days, and reply comments to be filed no later than 10 days thereafter.

5. Utility Employee Responsible for Filing

(Minn. Rule 7829.1300, subp. 3(E))

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6. Official Service List

Pursuant to Minn. Rule 7829.0700, Minnesota Power respectfully requests the following persons to be included on the Commission's official service list for this proceeding:

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7. Information Request Service List

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8. Service on Other Parties

Minnesota Power is eFiling this report and notifying all persons on Minnesota Power's SRSQ Service List that this report has been filed through eDockets. A copy of the service list is included with the filing along with a certificate of service.

9. Filing Summary

As required by Minn. Rule 7829.1300, subp. 1, Minnesota Power is including a summary of this filing on a separate page.

B. Organization of Filing

This Report covers Minnesota Power's safety, reliability and service quality for 2022 and its corresponding reliability results; and is organized into several sections. Each section is dependent on information from the other sections, making it appropriate to file the collection of sections as a single document. The sections and information addressed are:

- ❖ Key Reliability Performance Metrics
- ❖ List of Reporting Requirements
- ❖ Overview of Distribution System
- ❖ Public Facing Summary

- ❖ 2022 Year in Review
- ❖ Grid Modernization, System Construction and Protection
- ❖ Safety Reporting
- ❖ Reliability Metrics Reporting
- ❖ Meter-Reading Performance
- ❖ Customer Service Data
- ❖ Service Quality Performance Reporting
- ❖ Proposed Reliability Standards

Prior Commission-issued orders require Minnesota Power to respond in this filing with additional information not delineated in the administrative rules.

C. Key Reliability Performance Metrics

Reliability of the Company's distribution system is evaluated based on multiple metrics. The primary metrics used for this Report are the following:

- **System Average Interruption Duration Index ("SAIDI"):** Provides the total number of minutes of interruption the average customer experiences.
- **System Average Interruption Frequency Index ("SAIFI"):** Provides the frequency of sustained power outages (longer than five minutes) experienced by the average customer.
- **Customer Average Interruption Duration Index ("CAIDI"):** Derived by dividing SAIDI by SAIFI. The statistic generally speaks to the amount of time needed to respond to an outage.
- **Momentary Average Interruption Frequency Index ("MAIFI"):** Provides a measure of the average number of short outages, an interruption of electrical service Minnesota Power defines as lasting less than five minutes in duration.
- **Customers Experiencing Multiple Interruptions ("CEMI"):** Percent of customers experiencing more than 4, 5, or 6 outages in a year.

- **Customers Experiencing Lengthy Interruptions (“CELI”):** Percent of customers experiencing outages lasting longer than 6 hours, 12 hours, and 24 hours.
- **Average Service Availability Index (“ASAI”):** Percentage of customer’s hours that service was available, out of total customer hours demanded, during a given year.
- **Customer Minutes of Interruption (“CMI”):** Total number of customers interrupted multiplied by the total minutes of customer interruption

Other reliability and service-specific performance metrics are addressed in this Report to provide further information and transparency into Minnesota Power’s safety, reliability and service quality performance in 2022.

D. List of Reporting Requirements

This Report includes several reporting requirements that are new or updates to existing reporting requirements. Table 1 provides a cross reference of these reporting requirements to the location within this Report where this information is provided.

Table 1: 2022 Reporting Requirements

NEW REPORTING REQUIREMENTS		
2021SRSQ Report Order Dated November 9, 2022 in Docket No. E015/M-22-163		
Order Pt 2	Set Minnesota Power's 2022 statewide Reliability Standard at the IEEE benchmarking 2nd Quartile for medium utilities. Set Minnesota Power's work center reliability standards at the IEEE benchmarking 2nd quartile for small utilities. Require a supplemental filing to Minnesota Power's 2022 SQSR report 30 days after IEEE publishes the 2022 benchmarking results with an explanation for any standards the utility did not meet.	Anticipated to be filed August 2023
Order Pt 8	Required Xcel Energy, Minnesota Power, and Otter Tail Power to each display, either directly or via a link to a PDF file, the utility's public facing summary, as shown in Attachment A, on the utility's website placed such that the summary is available to a website user after a single click away from the home page.	Section I Pg. 14-15
Order Pt 9	Required Minnesota Power to describe in its 2023 filing its efforts to recruit, hire and train new call center representatives if data for service in 2022 show that the Company has not answered 80 percent of calls either made to the business office during regular business hours or for service interruption within 20 seconds.	Section VIII Pg. 90-92
Order Pt 10	Required Minnesota Power to make a compliance filing, within 30 days of the issuance of this order in Docket No.E015/M-22-163 and in next years' service quality docket, which reports monthly average answer time and call duration for all calls offered to agents, Customer Care and Support Representatives or otherwise, in the Company's Call Center during business hours. Minnesota Power shall provide the data in spreadsheet (.xlsx) format and to the greatest extent practicable. Where the Company is not able to do so, it shall explain why.	Section VIII Pg. 92-98 and Appendix C
Annual Summary of Customer Complaints Pursuant to Minn. R. 7820.0500 Order Dated January 18, 2023 in Docket No. E, G-999/PR-22-13		
Order Pt 2	Required utilities to include customer complaint data from Minnesota Rules 7820.0500 in their Annual Service Quality reports with data filed as part of Minnesota Rules 7826.2000.	Pg. 103-109
ON-GOING REPORTING REQUIREMENTS		
2020 SRSQ Report Orders Dated December 2, 2021 & March 2, 2022 in Docket No. E015/M-21-230		
Order Pt 4 (3/2/22)	Establish three work centers for Minnesota Power, as described on pages 25-26 of the Company's 2020 Safety, Reliability, and Service Quality Report.	Section II, pg. 17; Section V, pg. 44-46
Order Pt 2 (12/2/21)	Provide the following new information regarding electronic utility-customer interaction beginning with the reports filed in April 2023: Percentage Uptime [to second decimal] General Website XX.XX% Payment Services XX.XX% Outage map &/or Outage Info page XX.XX% Error Rate Percentage [to third decimal] Payment Services* XX.XXX% *If more granular data is available, please break down the error rate for unexpected errors, errors outside of the customer's control (i.e. how often to online payments fail for reasons other than insufficient funds or	Section VII pg.73-75

	expired payment methods), and/or some other meaningful categorization.”	
Order Pt 3 (12/2/21)	Provide percentage uptime and error rate percentage information in their annual reports for the next three reporting cycles, to build baselines for web-based service metrics.	Section VII pg.73-75
Order Pt 4 (12/2/21)	Continue to provide information on electronic utility-customer interaction such that baseline data are collected: a. Yearly total number of website visits; b. Yearly total number of logins via electronic customer communication platforms; c. Yearly total number of emails or other customer service electronic communications received; and d. Categorization of email subject, and electronic customer service communications by subject, including categories for communications related to assistance programs and disconnections as part of reporting under Minn. R. 7826.1700.	Section VII Pgs.71-72
Order Pt 7 (12/2/21)	File public facing summaries with their annual Safety, Reliability, and Service Quality reports. Utilities shall work with the Executive Secretary to publish those summaries in locations visible to consumers.	Section I Pg. 14-15
2019 SRSQ Report Order Dated December 18, 2020 in Docket No. E015/M-20-404		
Order Pt. 5	File the reliability (SAIDI, SAIFI, CAIDI, MAIFI, normalized/non-normalized) for feeders with grid modernization investments such as Advanced Metering Infrastructure or Fault Location Isolation and Service Restoration to the historic five-year average reliability for the same feeders before grid modernization investments.	Section III Pg. 30-31
Order Pt. 14	Each utility must report over the next two reporting cycles, to the extent feasible, the following: a. Yearly total number of website visits; b. Yearly total number of logins via electronic customer communication platforms; c. Yearly total number of emails or other customer service electronic communications received; and d. Categorization of email subject, and electronic customer service communications by subject, including categories for communications related to assistance programs and disconnections as part of reporting under Minn. R. 7826.1700.	Section VII Pgs.71-72
2018 SRSQ Report Order Dated January 28, 2020 in Docket No. E015/M-19-254		
Order Pt. 2	The Commission clarifies the reporting requirements from the Commission’s March 19, 2019 order, as specified in Attachment B: 1. Non-normalized SAIDI, SAIFI, and CAIDI values. 2. SAIDI, SAIFI, and CAIDI, MAIFI, CEMI, and CELI normalized values calculated using the IEEE 1366 Standard. 3. MAIFI – normalized and non-normalized. 4. CEMI – at normalized and non-normalized outage levels of 4, 5, and 6 interruptions. 5. The highest number of interruptions experienced by any one customer (or feeder, if customer level is not available). 6. CELI – at normalized and non-normalized intervals of greater than 6 hours, 12 hours, and 24 hours. 7. The longest experienced interruption by any one customer (or feeder, if customer level is not available). 8. A breakdown of field versus office staff as required Minn. Rules 7826.0500 Subp. 1, J, including separate information on the number of contractors for each work center.	Section V Pg. 44

	<p>9. Estimated restoration time accuracy, using the following windows:</p> <ol style="list-style-type: none"> Within -90 minutes to 0 of estimated restoration time Within 0 to +30 minutes of estimated restoration time <p>10. IEEE benchmarking results for SAIDI, SAIFI, CAIDI, and MAIFI from the IEEE benchmarking working group.</p> <p>11. Performance by customer class: ASAI, SAIDI, SAIFI, CAIDI, MAIFI Residential Non-normalized & Normalized, Commercial Non-normalized & Normalized; Industrial Non-normalized & Normalized. If reporting by class is not yet possible, an explanation of when the utility will have this capability.</p> <p>12. Causes of sustained customer outages, by work center.</p>	
<p>Reconnect Pilot Program Order Dated December 9, 2020 in Docket No. E015/M-19-766 (See pg. 4)</p>		
	<p>The Company committed to providing specific data related to its remote-reconnect pilot program (Reconnect Program)</p> <ol style="list-style-type: none"> Number of customers participating in the remote-reconnect program; Total number of Minnesota Power customers receiving low-income home energy assistance; Number of remote-reconnect participants receiving low-income assistance; Number of customers who have opted out of the remote-reconnect program; Estimated annual cost savings from the remote-reconnect program; Average time to reconnect using the remote-reconnect program compared to the standard reconnection process; and Number of reconnections restored within 24 hours of disconnection, distinguishing between standard and remote reconnections. 	<p>Section VIII Pg. 79-83</p>
<p>Minnesota Rules 7826.0400 – 7826.2000</p>		
<p>Annual Safety Report 7826.0400</p>		
	<p>Summaries of all reports filed with United States Occupational Safety and Health Administration and the Occupational Safety and Health Division of the Minnesota Department of Labor and Industry during the calendar year.</p>	<p>Section IV Pg. 42-43</p>
	<p>A description of all incidents during the calendar year in which an injury requiring medical attention or property damage resulting in compensation occurred as a result of downed wires or other electrical system failures and all remedial action taken as a result of any injuries or property damage described.</p>	<p>Section IV Pg. 42-43</p>
<p>Reliability Reporting Requirements 7826.0500</p>		
	<p>The utility's SAIDI for the calendar year by work center and for its assigned service area as a whole.</p>	<p>Section V Pg. 49</p>
	<p>The utility's SAIFI for the calendar year by work center and for its assigned service area as a whole.</p>	<p>Section V Pg. 49</p>
	<p>The utility's CAIDI for the calendar year by work center and for its assigned service area as a whole.</p>	<p>Section V Pg. 49</p>
	<p>An explanation of how the utility normalizes its reliability data to account for major storms.</p>	<p>Section V Pg. 50</p>
	<p>An action plan for remedying any failure to comply with the reliability standards set forth at part 7826.0600 or an explanation as to why non-compliance was unavoidable under the circumstances.</p>	<p>Section V Pg. 51-52</p>
	<p>To the extent technically and administratively feasible, a report on each interruption of a bulk power supply facility during the calendar year, including the reasons for interruption, duration of interruption, and any remedial steps that have been taken.</p>	<p>Section V Pg. 52-53</p>

A copy of each report filed under part 7826.0700 REPORTING MAJOR SERVICE INTERRUPTIONS.	Section V Pg. 53
To the extent technically feasible, circuit interruption data, including identifying the worst performing circuit in each work center, stating the criteria the utility used to identify the worst performing circuit, stating the circuit's SAIDI, SAIFI, and CAIDI, explaining the reasons that the circuit's performance is in last place, and describing any operational changes the utility has made, is considering, or intends to make to improve its performance.	Section V Pg. 53-54
Data on all known instances in which nominal electric service voltages on the utility's side of the meter did not meet the standards of the American National Standards Institute for nominal system voltages greater or less than voltage range B.	Section V Pg. 556
Data on staffing levels at each work center, including the number of full-time equivalent positions held by field employees responsible for responding to trouble and for the operation and maintenance of distribution lines.	Section V Pg. 56-58
Any other information the utility considers relevant in evaluating its reliability performance over the calendar year.	Section V Pg. 58-60
RELIABILITY STANDARDS 7826.0600; Subpart 1	
On or before April 1 of each year, each utility shall file proposed reliability performance standards in the form of proposed numerical values for the SAIDI, SAIFI, and CAIDI for each of its work centers. These filings shall be treated as "miscellaneous tariff filings" under the Commission's rules of practice and procedure, part 7829.0100, subp. 11.	Section IX Pg. 110
REPORTING METER-READING PERFORMANCE 7826.1400	
The annual service quality report shall include a detailed report on the utility's meter reading performance, including, for each customer class and for each calendar month: <ul style="list-style-type: none"> A. The numbers and percentages of customer meters read by utility personnel. B. The numbers and percentages of customer meters self-read by customers. C. The number and percentage of customer meters that have not been read by utility personnel for periods of six to twelve months and for periods of longer than twelve months, and an explanation as to why they have not been read. D. Data on monthly meter-reading staffing levels, by work center or geographical area. 	Section VI Pgs. 61-68
REPORTING INVOLUNTARY DISCONNECTIONS 7826.1500	
The annual service quality report must include a detailed report on involuntary disconnections of service, including, for each customer class and each calendar month: <ul style="list-style-type: none"> A. the number of customers who received disconnection notices; B. the number of customers who sought cold weather rule protection under chapter 7820 and the number who were granted cold weather rule protection; C. the total number of customers whose service was disconnected involuntarily and the number of these customers restored to service within 24 hours; and D. the number of disconnected customers restored to service by entering into a payment plan. 	Section VIII Pgs. 76-79
REPORTING SERVICE EXTENSION REQUEST RESPONSE TIMES 7826.1600	
The annual service quality report must include a detailed report on service extension request response times, including, for each customer class and each calendar month: <ul style="list-style-type: none"> A. The number of customers requesting service to a location not previously served by Minnesota Power and the intervals between the date service was installed and the later of the in-service date requested by the customer or the date the premises were reads for service. B. The number of customers requesting service to a location previously served by Minnesota Power, but not served at the time of the request, and the intervals between the date service was installed and the later of the in-service date requested by the customer or the date the premises were ready for service. 	Section VIII Pgs. 83-89

REPORTING CALL CENTER RESPONSE TIMES 7826.1700	
The annual service quality report must include a detailed report on call center response times, including calls to the business office and calls regarding service interruptions. The report must include a month-by-month breakdown of this information.	Section VIII Pgs. 89-100
REPORTING EMERGENCY MEDICAL ACCOUNT STATUS 7826.1800	
The annual service quality report must include the number of customers who requested emergency medical account status under Minn. Stat. §216B.098, subd. 5, the number whose applications were granted, and the number whose applications were denied, and the reasons for each denial.	Section VIII Pgs. 101-102
REPORTING CUSTOMER DEPOSITS 7826.1900	
The annual service quality report must include the number of customers who were required to make a deposit as a condition of receiving service.	Section VIII Pgs. 102
REPORTING CUSTOMER COMPLAINTS 7826.2000	
The annual service quality report must include a detailed report on complaints by customer class and calendar month, including at least the following information: A. The number of complaints received; B. The number and percentage of complaints alleging billing errors, inaccurate metering, wrongful disconnection, high bills, inadequate service, and the number involving service extension intervals, service restoration intervals, and any other identifiable subject matter involved in five percent or more of customer complaints; C. the number and percentage of complaints resolved upon initial inquiry, within ten days, and longer than ten days; D. The number and percentage of all complaints resolved by taking any of the following actions: (1) taking the action the customer requested; (2) taking an action the customer and the utility agree is an acceptable compromise, (3) providing the customer with information that demonstrates that the situation complained of is not reasonably within the control of the utility; or (4) refusing to take the action the customer requested. E. The number of complaints forwarded to the utility by the Commission's Consumer Affairs Office for further investigation and action.	Section VIII Pgs. 103-109

E. Overview of Distribution System

Minnesota Power is transforming the way it energizes communities and businesses through its Energy**Forward** resource strategy. First incorporated in 1906, Minnesota Power provides electricity service to approximately 150,000 residential and commercial customers, 14 municipal systems, and some of the nation's largest industrial customers across northeastern and central Minnesota. Minnesota Power's distribution system is comprised of 6,216 miles of distribution lines and 201 distribution substations ("distribution system"). The Company's service territory spans over 26,000 square miles from International Falls in the north, to Royalton in the south, and from Duluth in the east, to as far west as the Long Prairie and Park Rapids communities as shown in Figure 1.

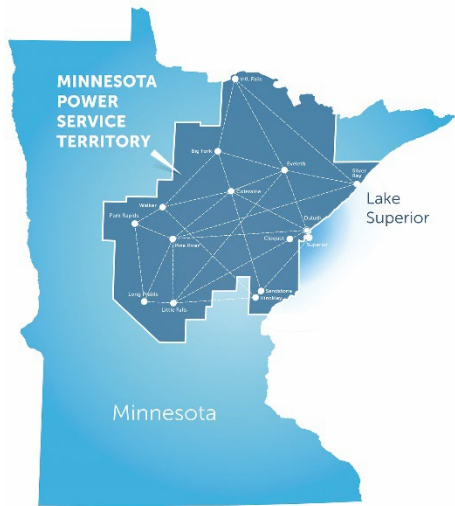


Figure 1: Minnesota Power's Territory

Residential and commercial customers are the primary users of the distribution system, with residential customers comprising a relatively large portion of Minnesota Power's distribution system load but only representing about 13 percent of Minnesota Power's annual retail electric sales. Much of the Company's service territory across northern and central Minnesota consists of rural communities. These rural communities and customers present unique issues when planning for investment in the distribution system. Customers located at the end of multiple miles

of line on a single feeder will present different service and reliability considerations than a customer located in a more populated area with feeder redundancy.

The Company also serves a diverse group of commercial customers with varying needs and expectations depending on the specific business (i.e., electric costs as a percentage of total operating/production costs, power quality and reliability needs, etc.). Commercial customers comprise approximately 14 percent of Minnesota Power's annual retail electric sales. Reliability is of the utmost priority to commercial customers, and for many of these customers, any interruption in electric service has the potential to stop business and immediately impact their bottom line. For those customers with sensitive loads and technology-related businesses, power quality, and even momentary outages, may be a significant issue.

Minnesota Power's large industrial customers are serviced directly from the transmission system, with the exception of required ancillary services, such as pumps and lighting, which are served from the Company's distribution system.

In order to meet the needs of its unique customer base, Minnesota Power developed its distribution strategy on the foundation of technology, innovation, and continuous learning. Customers expect reliable, affordable, and safe electric service, all of which are encompassed in the distribution planning strategy. Meeting these expectations requires

deploying right time/right fit distribution technology that is flexible, adaptable, and upgradable. The Company has also strategically positioned its distribution system for the deployment of emerging distribution technology through thoughtful planning in all areas of its business while maintaining a focus on customers' needs, upholding distribution planning principles,¹ and aligning these investments with the Company's sustainability² goals. Sustainable prosperity which balances economic, environmental, and social needs, for both the Company and its customers, over the long-term is Minnesota Power's goal. Safety, people, planet, and at the core - integrity must be in the balance of every decision made and action taken.

The public summary communication regarding Minnesota Power's 2022 SRSQ results is included below.

¹ *In the Matter of Minnesota Power's 2021 Integrated Distribution Plan*, Docket No. E015/M-21-390, 2021 Integrated Distribution Plan, at 9 (Oct. 25, 2021).

² Detailed in Minnesota Power's Approved *2021 Integrated Resource Plan*, Docket No. E015/RP-21-33, 2021 Integrated Resource Plan at 6 (Feb. 1, 2021).

2022 SAFETY, RELIABILITY, AND SERVICE QUALITY



AN ALLETE COMPANY

Minnesota Power, a division of ALLETE Inc., is committed to the reliability and security of the regional power system that provides electricity in a 26,000-square-mile electric service area in northeastern Minnesota.

MINNESOTA POWER PROVIDES OVER **99% RELIABILITY** for its 150,000 residential, commercial and industrial customers.

Reliability is having the energy when it's needed.



OUR MISSION:
We are committed to a sustainable future for the climate, our customers and our communities while delivering safe, reliable and affordable power.



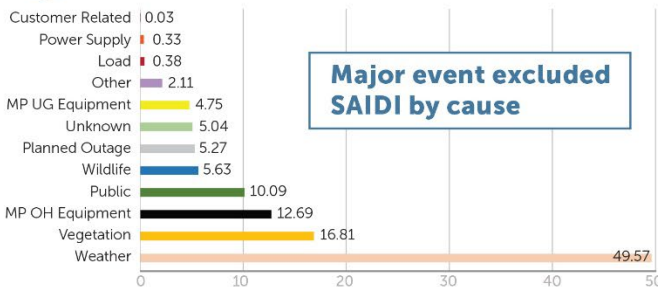
CUSTOMER SERVICE

Minnesota Power is dedicated to providing safe, reliable, affordable and increasingly clean electric service and to achieving high levels of customer satisfaction.

- In 2022, 104 lineworkers and 21 substation technicians responded to trouble calls and worked on maintenance of our distribution lines and associated equipment.
- In 2022, 77 employees working in a variety of positions, including vegetation management, fleet, inventory, service dispatch, and system operations, provided line operation support.

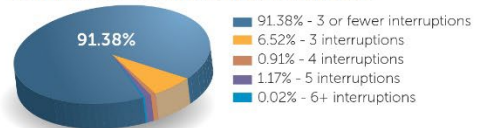
SYSTEM RESILIENCY

Interruptions are the total loss of electric power to one or more customers connected to the distribution system.



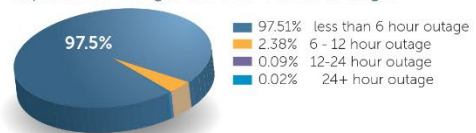
Nearly 92% of customers

experienced 3 or fewer interruptions in 2022



Almost 98% of customers

experienced outages less than 6 hours in length



What causes interruptions?

More windstorms in May, June and December contributed to weather being the most significant factor in reliability in 2022. Minnesota Power continues to invest in and execute reliability and resiliency initiatives to strengthen the company's system.

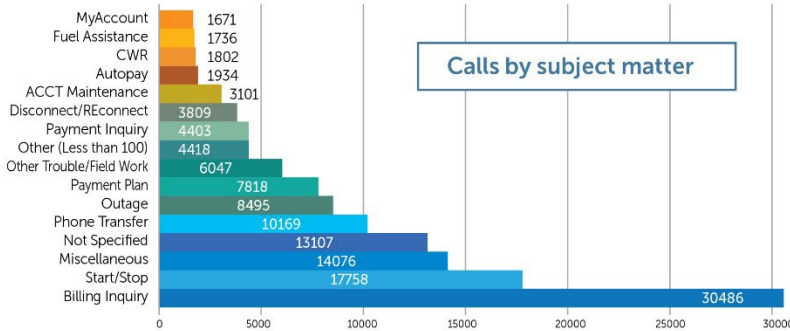
We work to minimize weather-related outages in a variety of ways, including:

- Using Trip Saver technology to minimize long duration outages and dispatch of service technicians.
- Providing resiliency during storm events and strategically strengthening the distribution system through our strategic underground initiative.
- Optimizing the use of a secure fiber-optic network and technology to quickly isolate and restore customers through the use of intellrupters and motor operated switches.

23068

CALL CENTER

In 2022, we received nearly 154,000 customer calls, and just over 16,000 customer emails in our Call Center.



COMPANY READ METERS:

In 2022, our meter reading systems provided over **99% of meter reads** across all customer classes. For residential customers, **99.61% of the reads** used for billing were through our systems or employees and less than **0.5% were customer-read or estimated.**



MUTUAL AID

Minnesota Power is a respected mutual aid partner lending assistance in the Midwest as a member of the Midwest Mutual Assistance Group as well as on a national level. Crews and line support staff have assisted on many natural disasters over the years including snow and high windstorms, hurricanes and wildfires.

In recognition of our mutual aid, Minnesota Power received an **Emergency Assistance Award** from the Edison Electric Institute for our responses to a nor'easter in New York in 2021, a derecho in Illinois in 2020, a severe snow and windstorm in Manitoba in 2019, and hurricanes in Puerto Rico in 2018, and Miami in 2017.



MYACCOUNT

MyAccount allows customers to track their energy use, set markers to see how events or home upgrades affect how much energy they use, and gives quick access to paying bills and managing their account online.



The Minnesota Power app makes it easier for customers to access the company's outage map and other outage information. Users are able to check on the status of power outages in their area, learn when their power will be restored or report an outage.

mnpower.com/mobileapp

COMMUNICATIONS

We communicate with our customers in person; by phone; through news releases, media, direct mail and bill inserts; on mnpower.com; through MyAccount at mnpower.com/myaccount; and via the Minnesota Power app.

NEED INFORMATION OR ASSISTANCE?

Customer Service: 1 (800) 228-4966 or
 CustomerService@mnpower.com
 Minnesota Relay/TTY: 711 or (800) 627-3529

REPORT AN OUTAGE OR ENTER A TROUBLE ORDER:
www.mnpower.com/OutageCenter/ReportAnOutage or
 call 800-30-POWER (218-307-6937); if emergency, call 911



People who communicate in a language other than English can request translation services by calling Minnesota Power at 800-228-4966. We also offer a translation option at www.mnpower.com.

Figure 2: Minnesota Power's Public Summary for 2022

II. 2022 Year in Review

Minnesota Power performed strongly on many of the metrics established and included in this SRSQ Report, particularly in the areas of reliability benchmarking, safety, storm response, and system resilience. Further details are shared below and discussed throughout this Report. As shared in previous SRSQ submittals, Minnesota Power swiftly adapted its operations as the COVID-19 pandemic evolved over the last few years. The Company began to return to normal practices in 2021 and 2022 and gladly embraced new opportunities, particularly for grid modernization, while continuing to endure many of the challenges that arose during the pandemic and responding to an emergence of atypical storm events. Specifically, the Company saw a new trend in storms where they occurred outside of the normal storm season, with many larger storms falling into typically quiet months. Most of the larger major event-excluded storms occurred in May and December of 2022.

Grid modernization efforts increased substantially with strategic undergrounding, recloser and IntelliRupter rollouts, and groundline inspections moving to a capital program. However, these efforts encountered supply chain challenges, inflation, and labor shortages throughout the year. For example, Minnesota Power continued to be impacted by supply chain disruptions which include unexpected, significant increases in commodity prices and lengthy delays in material delivery times. The Company has been proactively finding creative ways to address these impacts including: working with neighboring utilities, communicating with customers, working diligently with vendors and suppliers to identify new options, and incorporating longer lead times into its planning process. For critical items, the Company increased inventory levels to account for increased lead times observed to replenish stock.

Service quality continued to be negatively impacted in 2022, with call response times remaining below targets. Like many employers currently experiencing the implications of a workforce shortage, Minnesota Power's Call Center has continued to face staffing shortages and unplanned absences. Simultaneously, as more standard collections operations resumed after the COVID-19-related protections ended, the number of calls,

complexity of circumstances, and duration of calls increased. Minnesota Power has continued to work with customers on expanded payment agreement terms and accessing significantly increased available assistance program funding. Despite these efforts to help customers, arrears balances grew from the beginning of the pandemic and remain well-above pre-pandemic levels. Importantly, the Company has returned to optimal staffing levels in the Call Center and is starting to see more favorable call response times in early 2023.

The Commission recognized in its January 28, 2020 Order in Docket No. E015/M-19-254 that some metrics, including the method by which it currently sets reliability goals, may need to be modified and agreed that benchmarking provides a better way to understand how utilities are performing in relation to peer utilities. In Order Point 2 of its November 9, 2022 Order in Docket No. E015/M-22-163, the Commission set Minnesota Power's 2022 statewide Reliability Standard at the Institute of Electrical and Electronics Engineers ("IEEE") benchmarking 2nd Quartile for medium utilities, and set the Company's Work Center reliability standards at the IEEE benchmarking 2nd quartile for small utilities.

Based on the standards for medium utilities, the Company met these major event-excluded IEEE 2nd quartile target goals for SAIDI by 34.95 minutes, for SAIFI by 0.09 and CAIDI by 26.46 minutes.³

Based on the standards for small utilities, the Company met these major event-excluded IEEE 2nd quartile target goal for SAIDI in the Central, Northern, and Western Work Centers by 65.43, 39.10, and 19.31, respectively.

For SAIFI, the Company met the goal in the Central and Northern Work Centers by 0.37 and 0.44 respectively, but failed to meet this goal in the Western Work Center by 0.20. Lastly, the Company met the goal for CAIDI in the Central and Western Work Centers by 8.83 and 15.69, respectively, but failed to meet this goal in the Northern Work Center by 27.55.

³ Details of the Company's performance in relation to the work center reliability standards at the IEEE benchmarking 2nd quartile for small utilities are included in Section V.

Table 2: 2022 Overall & Work Center Reliability Results in Comparison to IEEE Standard

Year 2022	SAIDI	SAIFI	CAIDI
IEEE 2022 Medium Utilities 2 nd Quartile	147.65	1.21	127.35
Results- Overall	112.70	1.12	100.89
IEEE 2022 Small Utilities 2 nd Quartile	160.20	1.33	107.84
Results- Central	94.77	0.96	99.01
Results- Northern	121.10	0.89	135.39
Results- Western	140.89	1.53	92.15

*Red indicates goal not met

For all SAIDI values throughout 2022, including the six major events covering eight excluded days, there were more than 6,083 unique sustained outages (over five minutes in duration), of which 240 Large SAIDI Events (greater than 50,000 CMI) contributed more than 82 percent of overall SAIDI. The Company is experiencing a greater number of significant weather events with only a slight decrease in the major event exclusion threshold. These non-excluded larger events account for the majority of the Company's SAIDI minutes.

In 2022, Minnesota Power experienced an increase in the number of incidents (all power interruptions), including momentary outages. In total, the Company experienced about 7,500 incidents throughout the course of the year. In 2020 and 2021, the Company experienced about 6,000 and 5,900 incidents, respectively. This is indicating an increasing trend from the approximate 3,475; 5,000; and 5,100 incidents experienced in 2017, 2018 and 2019, respectively. The Company continues to assess this trend as it seeks to refine its expectations for the near-term and beyond.

A. Factors Affecting Reliability

For Major Event-excluded SAIDI data, weather events attributed to 44 percent, vegetation events 15 percent, overhead equipment failure 11 percent, and public events (car accidents, excavation damage to cables, etc.) caused 9 percent. The remaining outage minutes consisted of incidents related to wildlife, planned outages, underground equipment failures, and other causes. (More on causes of outages can be found in Section V of this Report.)

Weather was the largest reliability factor in 2022. High winds and lightning occurred at a higher frequency throughout the year. High winds during May and a heavy snowfall with high winds in December were the single largest contributors to overall outage totals. Minnesota Power is continually developing solutions and is executing several reliability initiatives to help minimize weather-related outages in the future. TripSavers, which are maintenance free single phase reclosers that are replacing cutouts, are being installed across Minnesota Power's service territory to clear temporary faults resulting from tree contacts and lightning. Strategic undergrounding efforts were continued in 2022 and will continue on some of the Company's worst performing overhead lines. For its strategic undergrounding effort, Minnesota Power is targeting areas where customers limit access to vegetation management, such as tree trimming, and areas where overhead lines were installed in inaccessible areas with heavy vegetation. The new standard for customer line extensions is to install underground facilities in all feasible locations. In 2022, over 37 miles of underground was installed across our distribution system including the conversion of overhead facilities to underground.

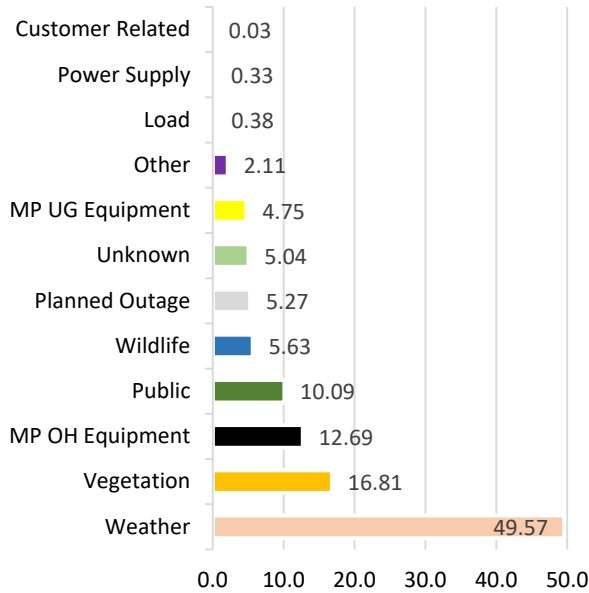
Equipment failure was also a contributing factor to reliability results in 2022. Asset renewal programs such as switch and cutout replacements, along with TripSavers, to replace porcelain cutouts are expected to aid improvement of this category. The Company is continuing the implementation of its Preventative Maintenance ("PM") program on substation and distribution equipment. This PM program includes replacement or refurbishment of switches, capacitor banks, and reclosers. In the future, the program will focus on transformers and regulators. By focusing on this PM program,

the Company can verify at any time that system equipment is functioning. PM reviews will also more readily identify equipment that needs to be replaced or updated as part of larger asset renewal programs. For more information regarding the Company's reliability improvement efforts, including strategic undergrounding and asset renewal, please see Minnesota Power's 2021 Integrated Distribution Plan in Docket No. E015/M-21-390.

In Figure 3 below, there are four graphs that depict Major Event Excluded SAIDI values by cause. These graphs are in units of Company SAIDI minutes, not percentage as listed above. These graphs display Company Total, Central Work Center, Northern Work Center and Western Work Center sorted by ascending cause order.

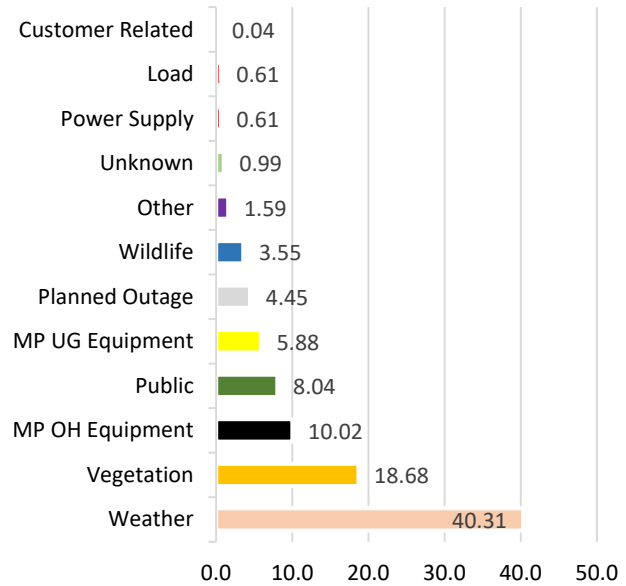
Company Total

Major Event Excluded SAIDI by Cause



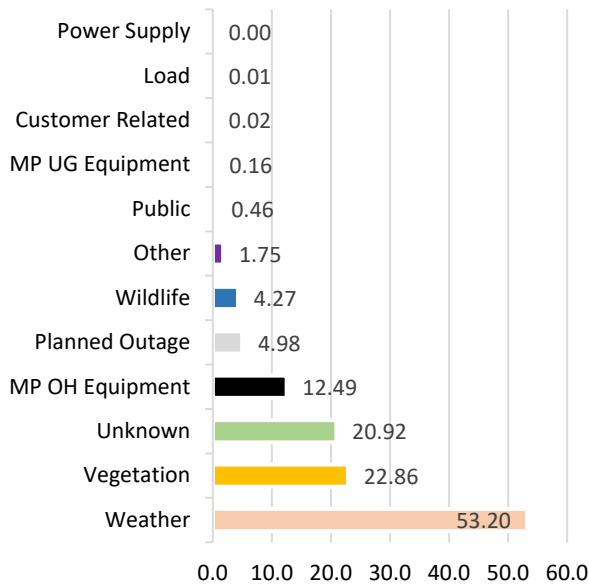
Central

Major Event Excluded SAIDI by Cause



Northern

Major Event Excluded SAIDI by Cause



Western

Major Event Excluded SAIDI by Cause

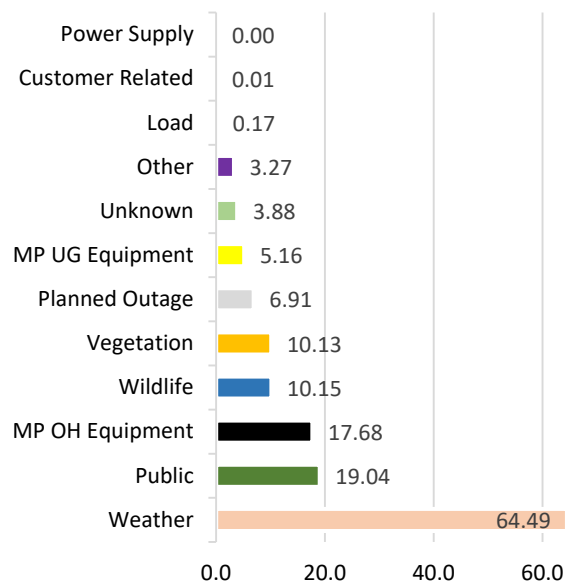
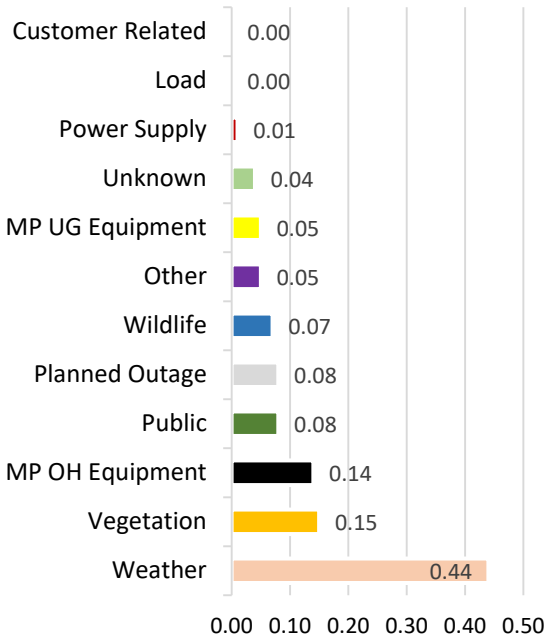


Figure 3: Major Event Exclude SAIDI Results

In Figure 4 below, there are four graphs that depict Major Event Excluded SAIFI values by cause. The graphs are measured in units of interruptions per average Company customer, Company SAIFI values. These graphs display Company Total, Central Work Center, Northern Work Center and Western Work Center sorted by ascending cause order.

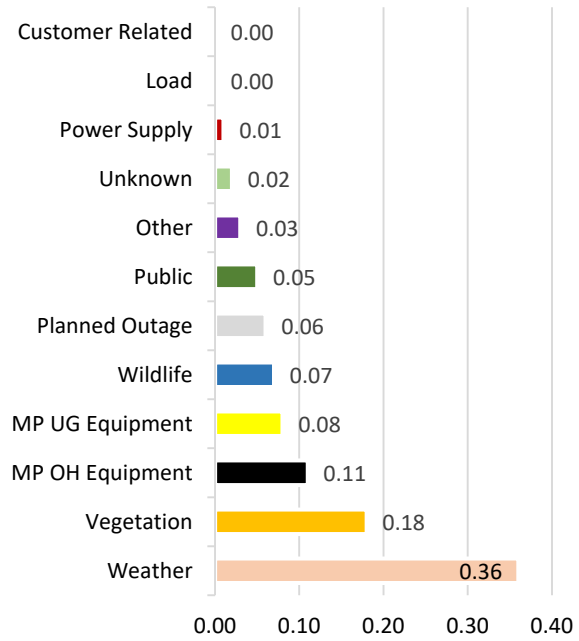
Company Total

Major Event Excluded SAIFI by Cause



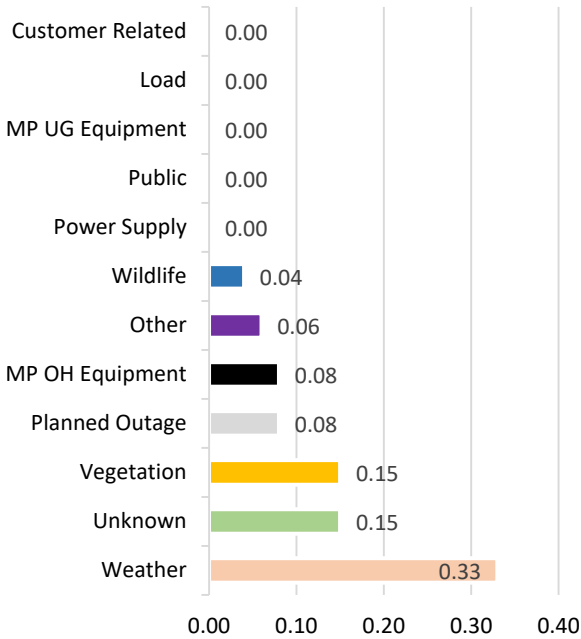
Central

Major Event Excluded SAIFI by Cause



Northern

Major Event Excluded SAIFI by Cause



Western

Major Event Excluded SAIFI by Cause

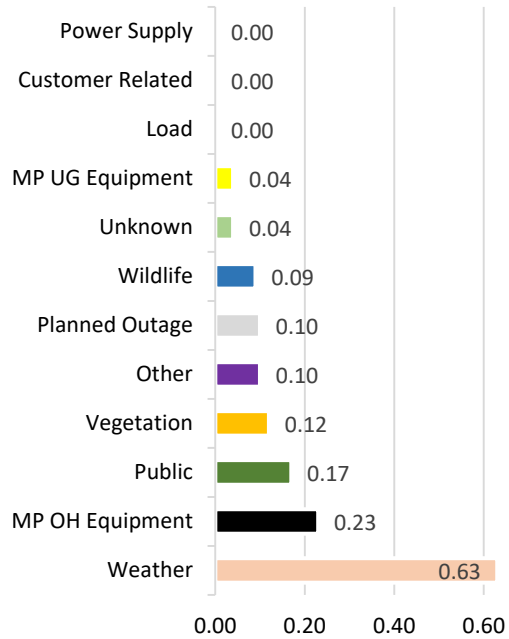


Figure 4: Major Event Excluded SAIFI Results

B. Reliability Cost Overview

The following graphs show the 2022 values: SAIDI with trouble costs, SAIFI with trouble costs, SAIDI with capital costs and SAIFI with capital costs. The increased capital spending reflects the Company's commitment to improve the reliability of its system through strategic investments. Increased trouble costs for 2023 account not only for inflation but also the increase in large major events, in total there were six excluded events covering eight days which is well above the five year average.

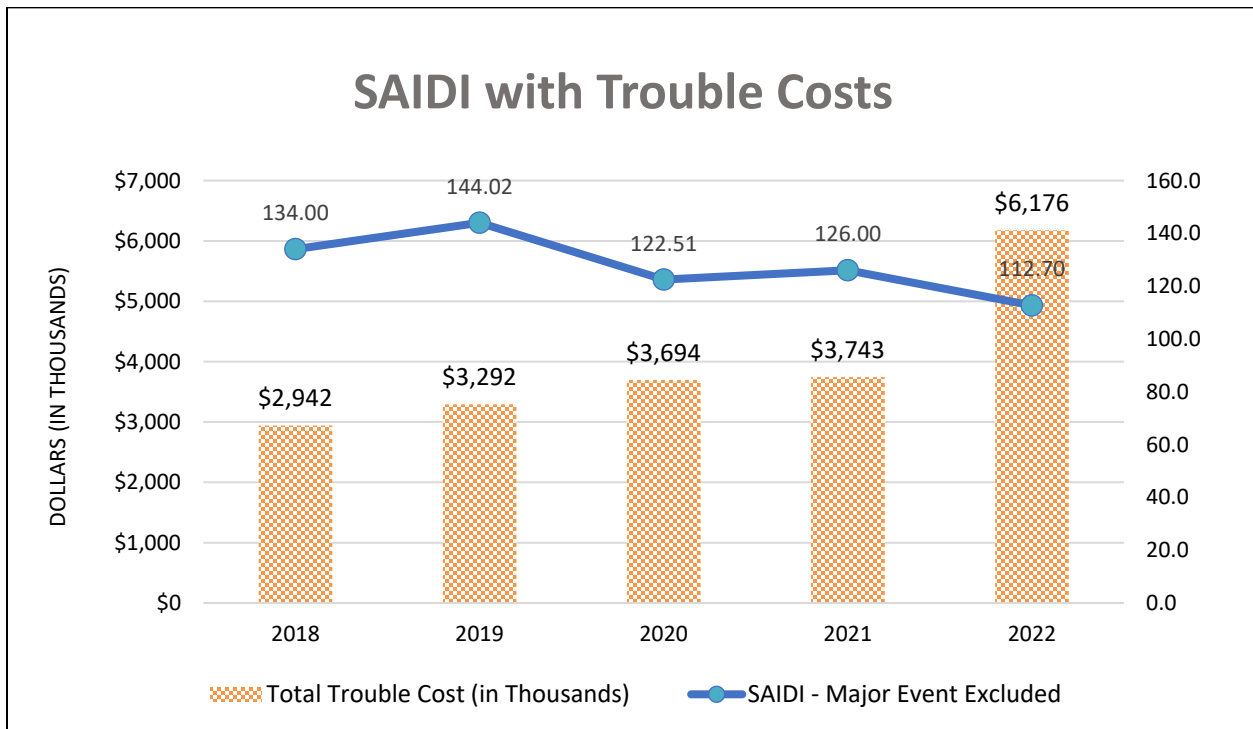


Figure 5: SAIDI with Trouble Costs (In Thousands)

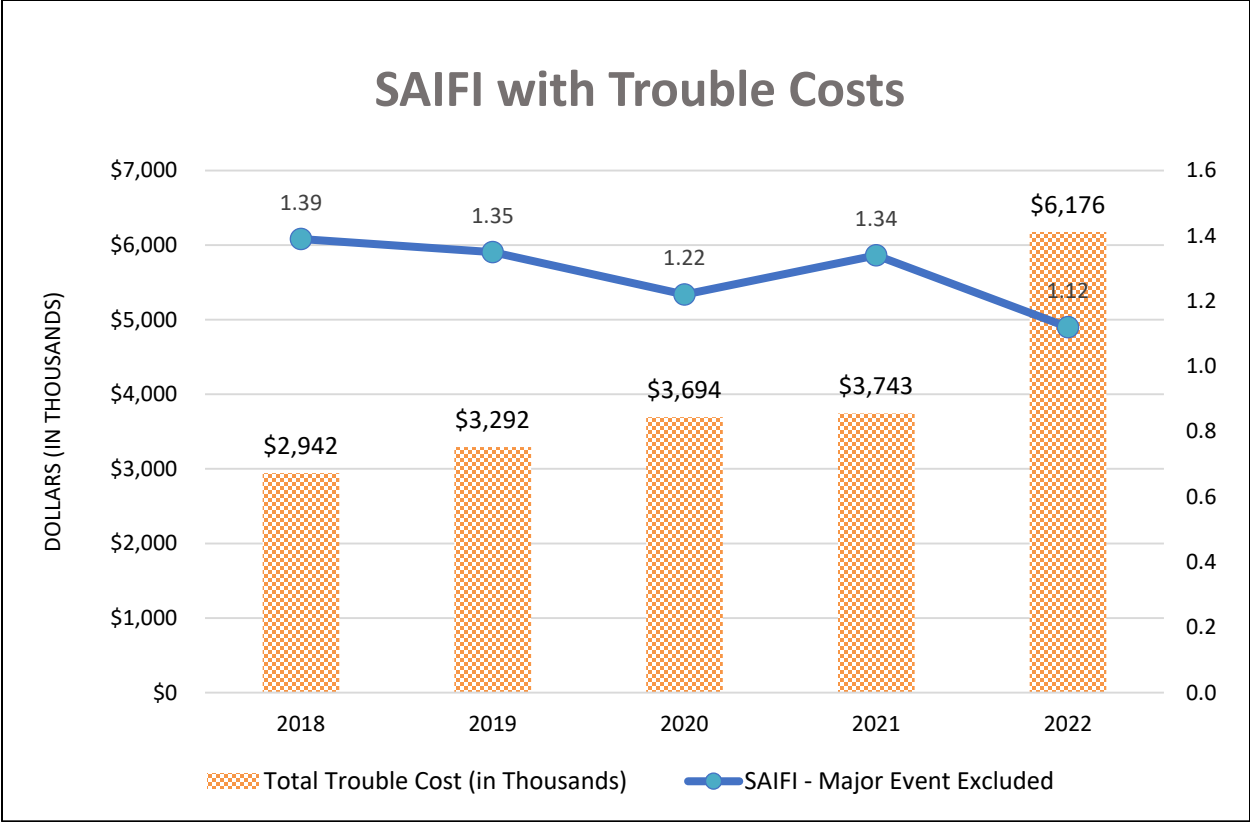


Figure 6: SAIFI with Trouble Costs (In Thousands)

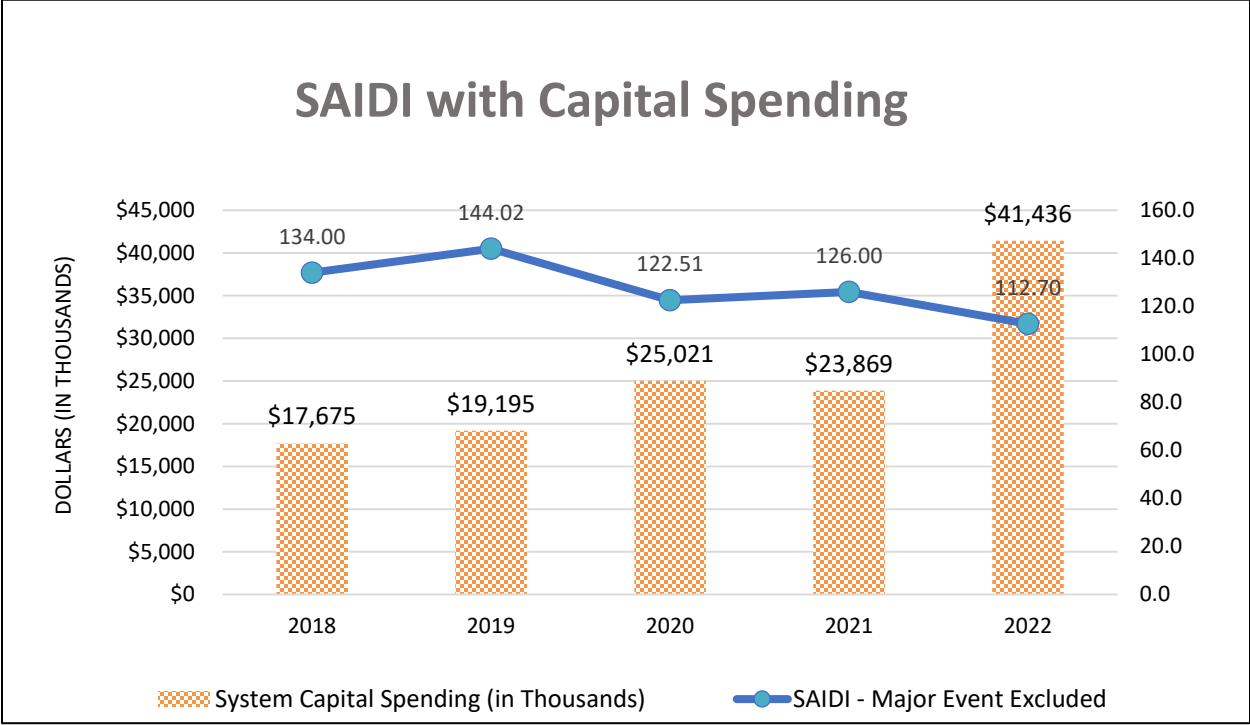


Figure 7: Major Event Excluded SAIDI with Capital Spending (In Thousands)

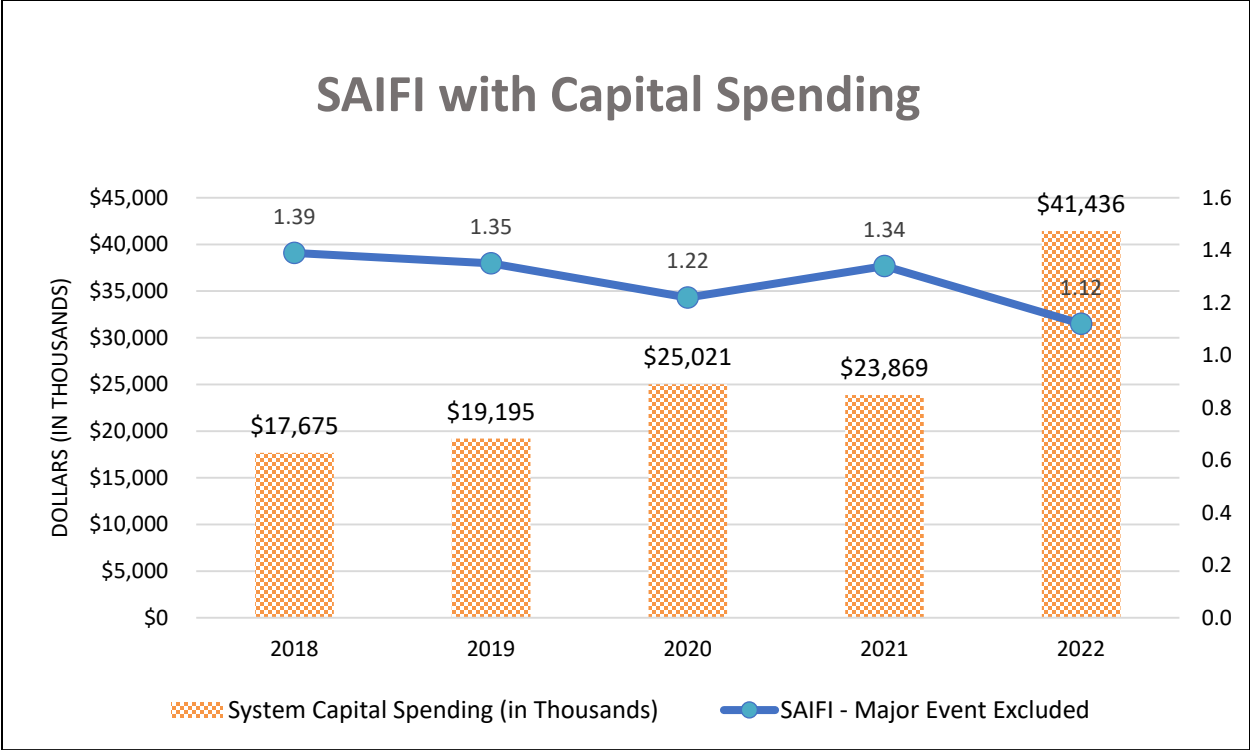


Figure 8: Major Event Excluded SAIFI with Capital Spending (In Thousands)

As communicated in Minnesota Power’s 2021 IDP, the Company also maintains a substation modernization program that is anticipated to include individual projects with a total cost of greater than two million dollars. The estimated cost and overview of these projects are discussed in Table 3: Five-Year Distribution Projects.

Table 3: Five-Year Distribution Projects

Project Name	Preliminary Projected Costs	Anticipated In-Service - Date	Project Area	Project Description
Switchgear Replacement Program	\$8.0M \$4.2M	2026 2028	<i>Anticipated Substations*</i> : Haines Road (Hermantown), Colbyville (Duluth) *subject to change based on asset renewal	Across Minnesota Power’s system there are many transmission-to- distribution substations that require age-related upgrades. Much of the original equipment in these substations is nearing or beyond the end of its useful life. Minnesota Power’s Switchgear Replacement Program involves coordinated replacement of end-of-life assets and holistic modernization improvements designed to extend the lives of these substations for the next several decades. Planned age-related replacements include distribution-voltage indoor switchgear, transformers, and associated

Project Name	Preliminary Projected Costs	Anticipated In-Service - Date	Project Area	Project Description
			project prioritization	equipment. The Switchgear Replacement Program takes a holistic, site-by-site approach to facilitating the coordinated and efficient modernization of aging substations with indoor switchgear throughout Minnesota Power’s system, addressing the unique needs and constructability considerations of these sites. In 2019-2020, the prioritization of Substation Modernization and Switchgear Replacement program projects was re-evaluated and updated to be consistent with the overall transmission and distribution asset renewal needs of each site.
Substation Modernization (Asset Renewal) Program	\$10.4M \$6.0M \$7.4M \$9.9M \$8.8M \$6.9M \$6.7M \$10.9M	2024 2025 2025 2026 2026 2027 2027 2027	<i>Anticipated Substations*:</i> Long Prairie, Winton, Maturi (Chisholm), Ridgeview (Duluth), Hibbing, Verndale, Cloquet, Little Falls *subject to change based on asset renewal project reprioritization	Across Minnesota Power’s system there are many transmission-to-distribution substations that require age-related upgrades. Much of the original equipment in these substations is nearing or beyond the end of its useful life. Minnesota Power’s Substation Modernization (Asset Renewal) Program involves coordinated replacement of end-of-life assets and holistic modernization improvements designed to extend the lives of these substations for the next several decades. Planned age-related replacements include outdoor circuit breakers, transformers, switches and associated equipment. The Program takes a holistic, site-by-site approach to facilitating the coordinated and efficient modernization of the many aging substations throughout Minnesota Power’s system. In 2019-2020, the prioritization of Substation Modernization and Switchgear Replacement Program projects was re-evaluated and updated to be consistent with the overall transmission and distribution asset renewal needs of each site.
Cloquet Area 34 kV Expansion	\$2.2M \$6.6M	2023 2025	Canosia Road (Esko), Mahtowa	The Canosia Road Substation 34 kV Expansion and Mahtowa Substation 35 kV Expansion will be the first two projects in a multi-year plan to modernize and improve the Cloquet-area distribution system. There are several factors driving the need for improvements in the Cloquet area:

Project Name	Preliminary Projected Costs	Anticipated In-Service - Date	Project Area	Project Description
				<ul style="list-style-type: none"> • <i>Asset Renewal & Standardization:</i> Implementing a standard 34.5 kV backbone distribution network for the Cloquet area. There are presently three different backbone distribution voltages between Cloquet, and Hinckley. The Canosia Road and Mahtowa Substation Expansion projects will convert existing 24 kV and 46 kV systems to 34.5 kV while addressing asset renewal needs for existing feeders and stepdowns associated with these systems • <i>System Capacity & Asset Renewal Project Constructability:</i> Enabling the Cloquet Substation Modernization (Asset Renewal) Project to take place. Cloquet Substation is one of the highest-priority asset renewal sites in the Minnesota Power system, but the distribution system lacks sufficient capability to reliably support the Cloquet area during the extended outage of the Cloquet Substation that would be needed to implement the asset renewal project • <i>Reliability & Grid Modernization:</i> Improving reliability for Cloquet-area customers by reducing feeder exposure, providing backup capability from new feeders and 34/14 kV stepdowns, and enabling feeder automation projects to be implemented for enhanced visibility and rapid system restoration

III. Grid Modernization, System Construction and Protection

In the following sections, the Company discusses its efforts to modernize and strengthen the distribution system in order to maintain safe, reliable, affordable – and increasingly resilient – energy to meet customer and stakeholders expectations.

A. Grid Modernization

Grid Modernization Projects are efforts that go beyond the Company's baseline efforts to maintain safe, reliable, and affordable energy, but are necessary to keep pace with changing technology, regulatory requirements, and customer expectations. Grid modernization is and has been a priority for Minnesota Power, and the Company has developed a plan to modernize the system and ensure reliability of service. With many assets more than 40 years old, asset management programs and investments have become an area of significant focus for the Company. Asset renewal programs have been bolstered in recent years in an effort to target areas known or likely to impact customer reliability and system resiliency. Minnesota Power has taken a strategic approach that targets key feeder and substation connected assets that are both at end-of-life and contributing negatively to reliability. At the substation level, programs have been integrated into a single substation modernization project designed to efficiently address all of the asset renewal needs at once.

Reliability improvements will continue to be implemented using equipment such as TripSavers, storm hardening the system via strategic undergrounding, and using FLISR (Fault Location, Isolation, and Service Restoration) technologies utilizing a secure fiber-optic network to quickly isolate and restore customers through the use of IntelliRupters, intelligent reclosers, smart sensors, and motor operated equipment. The Company will expand the use of TripSavers, which are maintenance free and significantly lower cost than traditional oil filled reclosers that have been historically used for similar applications. TripSavers are also being installed to replace cutouts, including porcelain fused cutouts that have a poor reliability history. TripSavers will clear temporary faults, resulting in improved reliability and reduced incidents requiring a line worker to be dispatched to restore an outage. The company is also piloting solid-dielectric vacuum

reclosers to replace the traditional oil-filled reclosers. These new reclosers do not require maintenance and should eliminate potential environmental incidents since they no longer have any oil to retire.

In 2022, 244 TripSavers were reprogrammed to operate more efficiently throughout the Company service area. Nineteen reclosers were installed or replaced across the Company's system, to further sectionalize long distribution feeders. These modifications should reduce the number of customers impacted from a single event. Additionally, five IntelliRupters were installed and in-service by March of 2022.

The winter storm in December 2022 showcased a few of these grid modernization improvements. From Major Event excluded data, the Company observed the newly installed IntelliRupters on PQT-531 isolated a fault and automatically restored 1,787 customers in seconds that would have previously experienced a prolonged outage. Similarly a new midline recloser on Haines Road 236 feeder, reduced customer outages from 2,990 customers to 809 customers. A new midline recloser on Gary 201 feeder reduced customer outages from 1,307 customers to 1,066 customers. Colbyville 240 feeder has been reconfigured to shift customers to a higher performing feeder. When COL-240 locked out, the impacted customers were reduced from 3,233 customer to 1,756 customers.

In compliance with Order Point 5 of the December 18, 2020 Order for the 2019 SRSQ Report, Minnesota Power provides the SAIDI, SAIFI, CAIDI, and MAIFI (normalized/non-normalized) for feeders with grid modernization investments to the historic five-year average reliability for the same feeders before grid modernization investments.

Table 4: Reliability Metrics for Feeders with Grid Modernization Investment

RGV-252 IntelliRupters installed 2011	Storm Included				Storm Excluded			
	SAIDI	SAIFI	MAIFI	CAIDI	SAIDI	SAIFI	MAIFI	CAIDI
Year								
Before Install 5 Year Avg. (2006-2010)	195.37	1.47	7.80	132.90	55.32	0.66	7.40	83.82
2022	36.59	0.52	13.94	70.37	35.15	0.51	12.04	68.92

RGV-256 IntelliRupters installed 2012		Storm Included				Storm Excluded			
Year	SAIDI	SAIFI	MAIFI	CAIDI	SAIDI	SAIFI	MAIFI	CAIDI	
Before Install 5 Year Avg. (2007-2011)	143.72	0.6	3.2	239.53	24.23	0.32	1.8	75.72	
2022	10	1	0	10	10	1	0	10	
SLA-203 IntelliRupters installed 2015		Storm Included				Storm Excluded			
Year	SAIDI	SAIFI	MAIFI	CAIDI	SAIDI	SAIFI	MAIFI	CAIDI	
Before Install 5 Year Avg. (2010-2014)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2022	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	
LSP-208 IntelliRupters installed 2015		Storm Included				Storm Excluded			
Year	SAIDI	SAIFI	MAIFI	CAIDI	SAIDI	SAIFI	MAIFI	CAIDI	
Before Install 5 Year Avg. (2010-2014)	0.00	0.00	0.20	0.00	0.00	0.00	0.20	0.00	
2022	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
FBG-269 TripSavers installed 2016		Storm Included				Storm Excluded			
Year	SAIDI	SAIFI	MAIFI	CAIDI	SAIDI	SAIFI	MAIFI	CAIDI	
Before Install 5 Year Avg. (2011-2015)	246.57	1.35	0.20	182.64	242.59	1.35	0.20	179.70	
2022	89.48	0.48	1.00	186.42	85.22	0.46	1.00	185.26	
COL-240 TripSavers installed 2018		Storm Included				Storm Excluded			
Year	SAIDI	SAIFI	MAIFI	CAIDI	SAIDI	SAIFI	MAIFI	CAIDI	
Before Install 5 Year Avg. (2012-2017 no 2016)	116.82	1.22	1.78	95.75	106.35	1.16	1.58	91.68	
2022	158.80	1.52	4.27	104.47	29.74	0.33	3.85	90.12	
PQT/BAX-531 IntelliRupters installed 2022		Storm Included				Storm Excluded			
Year	SAIDI	SAIFI	MAIFI	CAIDI	SAIDI	SAIFI	MAIFI	CAIDI	
Before Install 5 Year Avg. (2018-2022)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2023	TBD								

In Table 4, many of the feeders listed are bulk feeders, with few or no customers. Reliability statistics are directly tied to customer outages. As a result, there is little data to reflect how these grid modification projects have made an impact on these bulk feeders. The positive impacts from these upgrades are seen by customers on the step down feeders fed off of these bulk feeders. An accurate way of conveying the full impact of these projects is being reviewed.

B. Mobile Workforce Applications

The Company has made several advancements in tracking and improving the frequency of failed equipment. Minnesota Power has developed a number of Mobile Workforce applications that allow all employees to identify and improve areas of concern on the system. Minnesota Power has implemented Mobile Workforce in multiple phases, including:

- In 2017 paperless processing was created for maintenance issues on our system;
- In 2019 trouble tickets from the Outage Management System were pushed to line workers in the field, allowing trouble tickets to be processed electronically within that application;
- In 2020 an application was created that allowed our line workers to inspect feeders and submit issues in need of repair;
- In 2022 a mobile application used for storm response was rolled out;
- In 2023 the Company is implementing scheduling software to optimize work scheduling.

Digital work packets will focus on the integration of work and asset management systems to transition from a paper process to an electronic process utilizing mobile software.

Since 2017, the Company has received over 14,000 observations through its General Service Request Application and remedied over 96 percent of those observations. Maintenance work identified by the program is prioritized and executed daily. The Company expects to see rates of failed equipment decrease in future years as these issues are resolved. In 2020, this program was expanded to employees within vegetation management and transmission departments. In 2022, it was expanded to power delivery so they could report and resolve issues discovered within substations.

In 2019, processing trouble tickets was moved to a mobile application called VxField. Customers have access to a mobile tool to enter tickets when they experience outages. There has been considerable success in managing and completing these tickets online, essentially eliminating many phone calls and a paper process, as shown in Table 5 below.

Table 5: Mobile Application Tickets Entered

Year	Tickets Entered
2019	2,933
2020	9,588
2021	9,623
2022	14,057

This improved process allows line workers to receive and complete these tickets in the field, oftentimes leading to improved outage prioritization and shortened outage durations.

Starting in 2020, the pole maintenance inspection app was created for line personnel to actively inspect, address issues and track issue resolution on distribution feeders. This app also tracks which areas have been inspected and which areas still require inspection. By proactively identifying and fixing issues such as cracked insulators, cutouts, crossarms, and damaged poles, the Company expects reliability to improve as all feeders are inspected. Over the last three years (2020, 2021, and 2022), six, 25, and six feeder inspections were fully completed, respectively.

Lastly, an app was created to assist in storm response. This app, called Quick Capture, allows multiple assessors to quickly collect system conditions to help operations prioritize and plan the restoration effort.

C. Voltage Monitoring

Smart grid line sensors replaced obsolete line voltage and outage monitors in 2017. The new technology improves system monitoring including outages, voltage levels (under or over), current levels, line disturbances, faults, and power quality. Alarms and profiles will help identify areas that may be experiencing momentary outages or have temporary voltage drop or rise outside of normal operating limits. The Company now has line sensors

at every feeder within its system that did not have SCADA.⁴ This information is sent to area engineers, supervisors, and line personnel as events happen on the feeders.

Voltage monitoring is also managed through our Advanced Metering Infrastructure (AMI) system and a report is generated monthly to identify areas that need to be reviewed for possible improvements.

D. Vegetation Management

Vegetation Management is essential to improve reliability and mitigate risks of wildfire and power outages on the distribution system – and is even more critical for overhead portions of the distribution system that have long radial single-sourced feeders, primarily in rural areas. System reliability can be adversely impacted by many external environmental factors, and vegetation encroachments are one of the more significant factors that can impact the Company’s system. A coordinated and systematic vegetation management program is a key component of Minnesota Power’s distribution reliability effort. Minnesota Power has designed this program to address each distribution line approximately every six years and transmission lines every seven years. Vegetation management benefits the system in various ways, such as:

- Reduces momentary outage events due to vegetation contact
- Improves system performance by reducing wildlife contacts
- Improves restoration time as circuits are easier to access

Figure 9 presents Minnesota Power’s budget to spend for vegetation management over the past five years.

⁴ Supervisory control and data acquisition (“SCADA”) is a system comprised of hardware and software components used to monitor and control industrial processes. A SCADA system collects and analyzes real time production data, monitors and manage alarms, and programs automatic control responses triggered by certain events or system parameters.

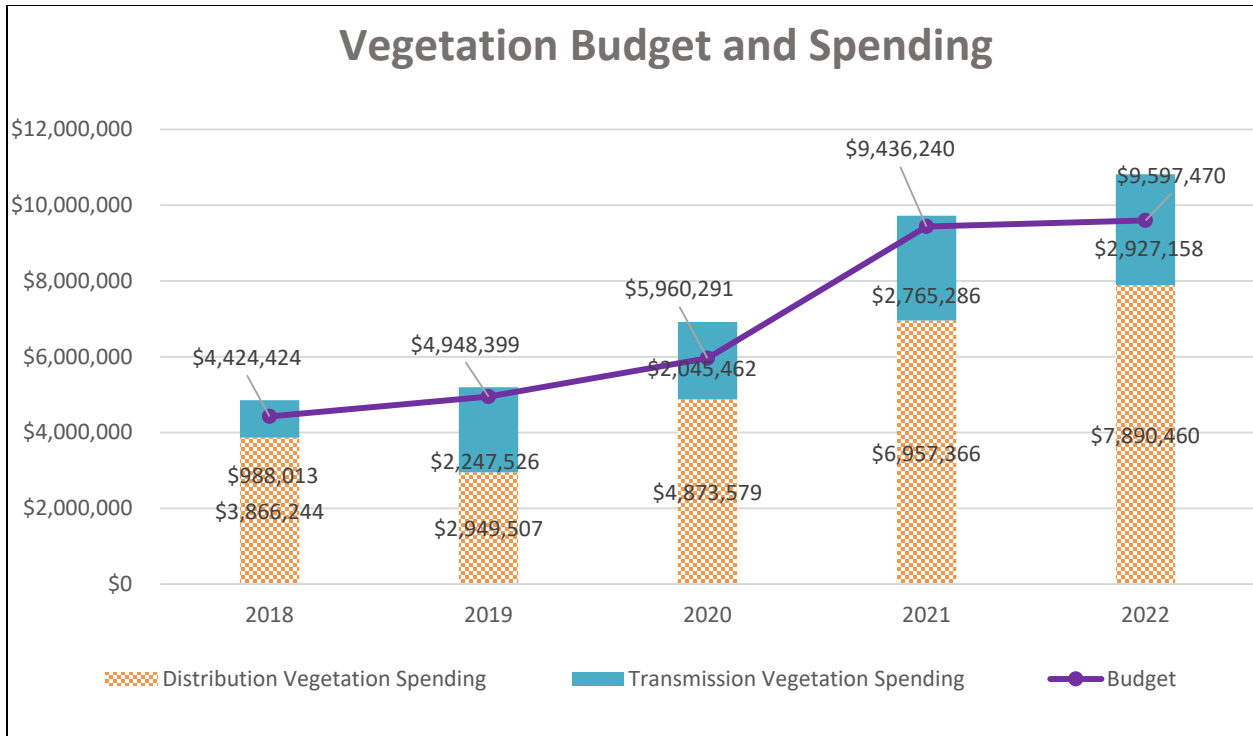


Figure 9: Vegetation Budget and Spend 2018-2022

Minnesota Power’s vegetation management program for its distribution system manages 307 electrical circuits spanning 4,571 miles of overhead distribution right-of-way. Routine vegetation management activities are typically scheduled on a six year timetable, but this schedule may be advanced or delayed, depending on actual conditions. Since vegetative growth depends on many conditions such as: precipitation, temperature, length of growing season, type of vegetation, soil fertility, and the time of year the circuit was previously maintained; the actual maintenance schedule may be longer or shorter than six calendar years.

Vegetation maintenance is normally accomplished through tree pruning, tree removal and/or application of herbicide. In addition to routine vegetation maintenance, Minnesota Power responds directly to tree concerns from its customers. When a customer calls with a tree concern, a Company representative visits the customer’s property to investigate the situation. In cases where the vegetation creates a potential electrical hazard due to its proximity with the electric facilities, Minnesota Power eliminates the hazard. However,

it should be noted that trees can fall onto lines that are well outside of the prescribed vegetation management limits addressed as part of the regular maintenance cycle.

Minnesota Power plans to continue diligent management of the vegetation on its distribution system on a targeted six year basic cycle. The Company's vegetation management program utilizes three Certified Arborists in determining the actual vegetative growth, environmental conditions, reliability performance and growing seasons for each circuit. After examining these factors, the Company determines the timing of circuit clearing activities. This approach has aided in providing customers with reliable service for many years.

Table 6 lists the individual circuits scheduled to receive routine maintenance that have not had vegetation management activities in the six years prior to December 31, 2022. Together, they represent 9 percent of the Company's total distribution system by line miles. All of these circuits will be completed in 2023.

Table 6: Circuits Outside of 6-Year Trimming Cycle

Sub	Feeder	Mileage	Last Done	Scheduled	Years
COL-242	Colbyville 242	26.0	2015	2023	8
COE-1	Coleraine, Arena, Curley Ave.	1.8	2015	2023	8
COF-1	Coleraine, Overpass, Hwy 169	1.4	2015	2023	8
GRR-325	Grand Rapids 325	5.9	2015	2023	8
BFV-2	Bigfork 2	8.2	2016	2023	7
WNT-33	Winton 33 (46kV)	5.9	2016	2023	7
RGV-251	Ridgview 251	7.8	2016	2023	7
RGV-252	Ridgview 252	18.5	2016	2023	7
RGV-253	Ridgview 253	62.1	2016	2023	7
RGV-254	Ridgview 254	11.8	2016	2023	7
RGV-255	Ridgview 255	4.9	2016	2023	7
RGV-256	Ridgview 256	3.6	2016	2023	7
DML-380	Diamond Lake 380	4.2	2016	2023	7
KLY-1	Kelly Lake	3.5	2016	2023	7
MAR-1	Marble 1	2.5	2016	2023	7
NAS-314	Nashwauk 314	6.0	2016	2023	7
NAS-318	Nashwauk 318	8.7	2016	2023	7
NAS-319	Nashwauk 319	48.2	2016	2023	7
PNN-1	Pengilly North 1	1.0	2016	2023	7
PNS-1	Pengilly South 1	0.7	2016	2023	7
STZ-1	Stuntz 1	7.6	2016	2023	7
STZ-2	Stuntz 2	7.2	2016	2023	7
SVE-1	Spudville East 1	6.0	2016	2023	7
SVW-1	Spudville West 1	11.5	2016	2023	7
SWE-1	Stuntz, N of Wilpen Bridge	6.6	2016	2023	7
TAC-1	Taconite Village 1	1.1	2016	2023	7
FIN-6511	Finlayson 6511	18.4	2016	2023	7
FBG-269	Fredenburg 269	22.4	2016	2023	7
KER-6501	Kerrick 6501	21.2	2016	2023	7
MAH-6411	Mahtowa 6411	38.1	2016	2023	7
PIO-270	Pioneer 270	17.1	2016	2023	7
WRR-6321	Wrenshall Riverside 6321	23.6	2016	2023	7
	Total	413.5			

E. Line Inspection Program

Minnesota Power has an active line inspection program which includes the inspection of each pole on a ten year cycle. In 2022, Minnesota Power moved from an age-based program to an age and species -based inspection program. Poles that are 11 years and older are bored both above and below ground. Prior to 2022, the Company did not bore below the ground line. During this process, the poles are checked internally for structural integrity. Approximately 15,000 poles, or ten percent of total pole plant, are inspected annually. Depending on what is found during the pole inspection, one of the following actions is taken:

- 1) Poles found to be compliant with inspection criteria are identified as needing no work pending the next ten year inspection; or
- 2) If insects or decay within the pole are found and treatable, action is taken to stop further effects from the insect or decay; or
- 3) If the pole is beyond treatment or stubbing, it is replaced.

Along with poles, line inspectors also visually inspect electrical equipment and other attachments to the pole, as well as ground-mounted equipment, looking for potential problems. The contracted line inspectors are given Minnesota Power contact information that allows them to resolve issues requiring immediate response in the field. Other items are addressed through a standardized Groundline Resolution program. Minnesota Power is currently in the eighth year of its second complete ten year cycle. The Company estimates that the average age of the poles in its service territory are 35 years old and the average age of a replaced pole is approximately 50 years old. Minnesota Power has found this to be a prudent and logical way of evaluating and replacing the poles on its system.

F. Emergency Preparedness and Mutual Aid

Mutual aid is the cooperation between utilities to provide labor and vehicles to a utility so profoundly affected by outages that it is unlikely they will have the ability to restore power

to all of their customers within four to seven days. A robust protocol has been developed between the Midwest Mutual Assistance Group (“MMAG”) which is comprised of 34 investor-owned utilities. Generally, a utility calls upon Mutual Aid when they face a week or more of outage times and multiple weeks of restoration work. Regionally, neighboring mutual aid partners, when able, respond to outages and restoration work estimated in the 36 to 48 hour timeframe. Responding utilities are reimbursed by the requesting utility for all expenses incurred.

To begin the process, Mutual Aid member representatives are contacted via e-mail, text message and finally a call by an interactive voice response unit. Each company has a minimum of two (and most have three) Mutual Aid representatives, so attendance by each utility on the conference call is virtually guaranteed. At the beginning of a Mutual Aid call, the moderator references a spreadsheet with all of the utility names and their representatives. The moderator will work utility by utility, obtaining and recording system status, utility needs and utility resources. After all of the utilities have reported, the most effective response coordination is formulated and finalized.

Utilities also utilize the Resource Allocation Management Program for Utility Personnel (“RAMP-UP”) tool, where a requesting utility can enter their needed resources, and the other utilities can put in their crew resources until the need is filled. RAMP-UP was created after Superstorm Sandy in 2012 when Edison Electric Institute (“EEI”) leadership initiated the National Response Event to provide a better way to allocate responding resources among the requesting utilities on a national basis. Prior to RAMP-UP, a spreadsheet was developed to capture and manage all resource requests and responses. This spreadsheet was not designed to be multi-user, had limited reporting capabilities, and was difficult to use. RAMP-UP is a network-based, multi-user application designed to support several hundred concurrent users.

RAMP-UP allows users to: initiate a new event within RAMP-UP; enter their requests for needed resources or offers to provide resources; see a consolidated view of requests and responses displayed in a Map View; run an allocation calculation to determine equitable shares of resources for each requesting company; match the requests with the crews and

other resources being offered; produce useful reports; and provide situational awareness to key organizations during an event.

EEl worked closely with its members and utility partners to create RAMP-UP, and is another way EEl member companies seek to continually improve and move forward in storm and disaster response. To date, this has been the best tool to efficiently get a requesting utility help efficiently and effectively, both regionally and nationally.

Table 7: 2022 Mutual Aid Events

Requesting Utility	Reason	Location	Date
Xcel Energy	Wind/Storm	Bloomington, MN	8/3/22-8/4/22
Florida Public Utilities	Hurricane Ian	Fernandina Beach, FL	9/28/22-9/30/22

On August 3, the Company was directly called by Xcel Energy to assist with a summer storm/wind event. A Minnesota Power and Superior Water Light & Power response team of 20 line workers, two line supervisors, and one mechanic was assembled. The team worked primarily near the Mall of America in and around Bloomington, Minnesota.

On September 28, with the anticipation of Hurricane Ian, the Company’s Midwest Mutual Assistance Group initiated a request through RAMP-UP to assist the many Florida electric utilities, pre-staging crews prior to the storm reaching landfall. A Minnesota Power and Superior Water Light & Power response team of 20 line workers, two mechanics, two line supervisors, and one safety specialist mobilized and traveled to assist Florida Public Utilities with restoring power in the Jacksonville, FL area after the predicted damage from Hurricane Ian.

The response team left from their respective service centers across Minnesota Power’s service territory and from Superior Water Light & Power on Wednesday, September 28, and was expected to arrive in northeastern Florida near Jacksonville on Friday, when Hurricane Ian was predicted to move north and open the way for the storm response. As they left for Florida on Wednesday, the hurricane was approaching Category 5 strength with winds of 155 miles per hour.

Luckily for Florida Public Utilities, Hurricane Ian didn't have a major impact on its service territory, so they released Minnesota Power before arrival. The Company made an attempt to call other utilities who were affected by the hurricane, but due to the enormous pre-staging with other utilities and contractors, assistance was not needed. Crews turned around in Paducah, KY and headed back home, returning safely on September 30.

G. Mutual Aid Recognition

Minnesota Power crews have assisted other utilities during many natural disaster-related outages over the years, and the Company has received several Emergency Assistance Awards for its service. The Emergency Assistance Award is given to select EEI member companies to recognize their outstanding efforts to assist other electric companies with power restoration after service has been disrupted by severe weather or other major incidents. The winners are chosen by a panel of judges following an international nomination process. Although Minnesota Power did not receive any EEI Emergency Assistance Awards for mutual aid responses in 2022, the Company has in prior years and remains committed to assisting other utilities in times of need.

IV. Safety Reporting

“Together we choose to work safely for our families, each other and the public. We commit to be injury-free through continuous learning and improvement.”

Safety is a core value at Minnesota Power. The Company provides important safety information for customers on its website (<https://www.mnpower.com/CustomerService/safety>) addressing topics including: Call Before You Dig; Outdoor Safety; Electrical Safety at Home: Electrical Safety at Work; Electrical Safety for Emergency Responders; and Please Drive Safely Around Our Crews. Per Minn. Rule 7826.0400, the Company provides the required information.

A. Summaries of all reports filed with United States Occupational Safety and Health Administration and the Occupational Safety and Health Division of the Minnesota Department of Labor and Industry during the calendar year.

Table 8: 2022 OSHA Reportable Injuries

Number of Cases

Deaths	Total number of cases with days away from work	Job transfer or restriction	Other recordable cases
0	5	9	10

Number of Days

Days of job transfer or restriction	Days away from work
369	51

Injury and Illness Types

Injuries	Skin disorders	Respiratory conditions	Poisonings	All other illnesses
20	3	1	0	0

B. A description of all incidents during the calendar year in which an injury requiring medical attention or property damage resulting in compensation occurred as a result of downed wires or other electrical system failures and all remedial action taken as a result of any injuries or property damage described.

There was one incident in 2022 in which injuries requiring medical attention occurred as a result of a response to downed wires. During a December storm event, a line department employee was loading crossarms into the bed of a company pick-up truck when they pinched their finger between two crossarms. A clinic visit took place that day

with no medical attention and a follow up appointment scheduled. Higher level medical attention was given at the follow up appointment for tendons in the finger.

A listing of all incidents in which property damage resulting in compensation occurred as a result of downed wires or other electrical system failures and the remedial actions taken is included in Table 9.

Table 9: 2022 Damage Claims Paid

Date	Cause of Damage	Paid
2022-2-7	Damage to Private Underground- Electrician's Invoice	\$719.83
2022-3-3	Train Car Derailment	\$52,082.18
2022-3-16	Fence Damage	\$102.00
2022-3-17	Damaged Cement Post	\$750.00
2022-3-20	Equipment Failure - Vehicle Damage	\$7,077.39
2022-3-20	Equipment Failure - Vehicle Damage	\$5,343.03
2022-4-1	Electrician's Invoice	\$500.00
2022-5-19	Windshield Damage - Rented Vehicle	\$351.60
2022-6-1	DC-Line Storm - Crop Damage	\$10,340.00
2022-6-1	DC-Line Storm - Crop Damage	\$12,512.00
2022-6-1	Electrician's Invoice	\$80.00
2022-6-1	DC-Line Island Construction - Crop Damage	\$200.00
2022-6-14	Dig-in	\$3,421.46
2022-6-17	Employee Failed to Stop - Damage to Rental	\$17,288.59
2022-7-15	DC-Line Storm - Crop Damage	\$150.00
2022-7-29	Vehicle Damaged by Forklift	\$940.88
2022-8-11	Field Error - Secondary Connections	\$3,032.16
2022-9-7	Vehicle Damage	\$4,872.99
2022-9-13	Mailbox Damage	\$201.23
2022-11-1	Damaged Weather Station	\$132.02
Total Payment for 20 Claims:		\$120,097.36

V. Reliability Metrics Reporting

This section includes information submitted in compliance with the following:

- **Minnesota Rule 7826.0500 – RELIABILITY REPORTING REQUIREMENTS**
- **Order Pt. 4 of March 2, 2022 Order (Docket No. E015/M-21-230)**
- **Order Pts. 5 & 14 of December 18, 2020 Order (Docket No. E015/M-20-404)**
- **Order Pt. 2 of January 28, 2020 Order (Docket No. E015/M-19-254)**

Minnesota Power is committed to the reliability and security of the regional power system that provides electricity across a 26,000-square-mile electric service area in northeastern Minnesota. In 2022, the Company provided over 99 percent reliability for its residential, commercial and industrial customers. As previously stated, the reliability of the distribution system is evaluated using SAIDI, SAIFI, CAIDI, MAIFI, CEMI, CELI and ASAI.

The utility's SAIDI, SAIFI and CAIDI are calculated using the data excluded by the IEEE 2.5 beta method (data from major event days). A major event is defined by the 2.5 beta method developed by the IEEE Standard for Distribution Reliability. If the event reaches this threshold, it is excluded. The exclusion process is designed to remove all outage records attributed to a specific, major event such as a large storm. Major Event Included means that all major events such as wind storms, ice storms, etc., are included in the reliability calculations. Since there were six excluded events in 2022, the Major Event Excluded values are different from the Major Event Included values.

A. Work Centers

Prior to Minnesota Power's 2020 SRSQ Report, the Company responded as one work center. In compliance with Order Point 4 of the Commission's March 2, 2022 Order, which established future SRSQ reporting guidelines, the Company provides reliability performance metrics for each of its Work Centers (Central, Northern and Western), in addition to the overall system performance.⁵ See Figure 10 below.

⁵ As described on pages 25-26 of the Company's 2020 SRSQ Report (Docket No. E015/M-21-230).

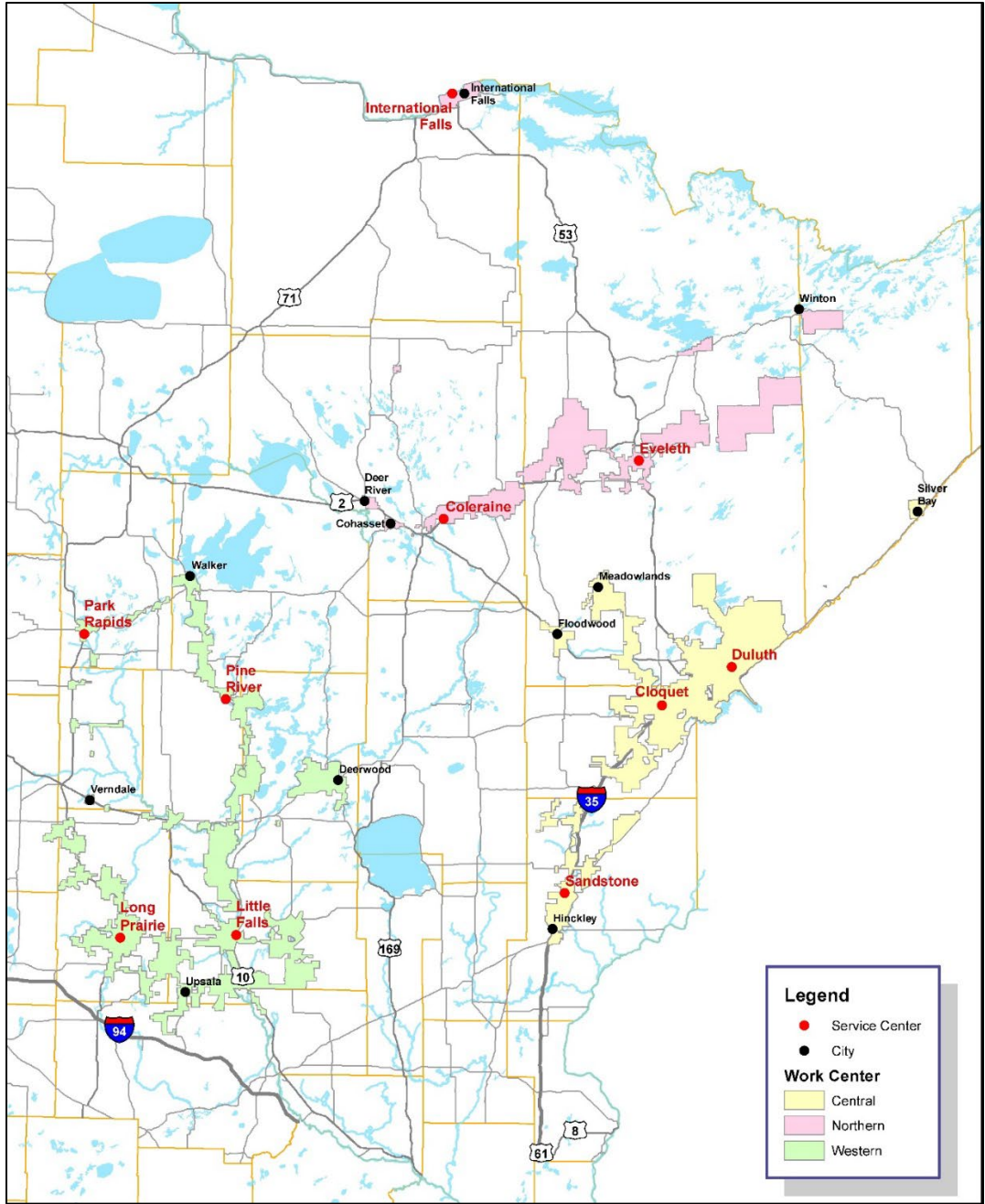


Figure 10: Location of Central, Northern & Western Work Centers

The Central Work Center includes service centers in Duluth, Cloquet, and Sandstone, with a customer count of over 77,800, as determined by service points. This area is by far the most populous and contains the largest city within the Company’s service territory, Duluth. It also includes the customers from Floodwood to Silver Bay and Meadowlands to Hinckley.

The Northern Work Center includes service centers in Eveleth, Coleraine, and International Falls. This area has the least amount of customers, with a count of just over 23,000, as determined by service points, but contains all of Minnesota Power's largest mining customers and two major paper customers. This area also serves many wholesale municipal customer accounts. It includes the customers from Deer River to Winton and International Falls to Cohasset.

The Western Work Center includes service centers in Little Falls, Long Prairie, Pine River, and Park Rapids. This area has over 42,600 customers, as determined by service points, and covers the Brainerd lakes area and rural farming communities, along with a couple of wholesale municipal accounts. It includes customers from Verndale to Deerwood and Walker to Upsala.

B. Benchmarking

The Commission recognized in its January 28, 2020 Order⁶ that some metrics, including the method by which it currently sets reliability goals, may need to be modified, and agreed that benchmarking provides a better way to understand how utilities are performing relative to peer utilities.

Order Point 2 of the Commission's November 9, 2022 Order for the 2021 SRSQ Report sets Minnesota Power's 2022 statewide reliability standard at the IEEE benchmarking second quartile for medium utilities and sets Work Center reliability standards at the IEEE benchmarking second quartile for small utilities. These reliability metrics take into consideration varying reporting methods, system terrain and age, and customer mix, among other factors. This depiction of reliability metrics is a more holistic view of what is happening on electric distribution systems nationwide. The Company has actively participated in the IEEE Transmission and Distribution Reliability Working Group over the last several years, gaining valuable insights. This committee is working towards a consistent application of IEEE 1366 reliability standard with industry partners and the Company is appropriately benchmarking regionally with others of similar size on reliability

⁶ 2018 Safety, Reliability and Service Quality Report (Docket No. E015/M-19-254).

measurements and efforts. Figure 11 identifies the regions represented by the participants in the 2022 Benchmark Study (results to be released later in 2023). As required by Order Point 2 of the November 9, 2022 Order, the Company will file a supplemental filing to its 2022 SRSQ Report within 30 days after IEEE publishes the 2022 benchmarking results, including an explanation for any standards Minnesota Power did not meet.

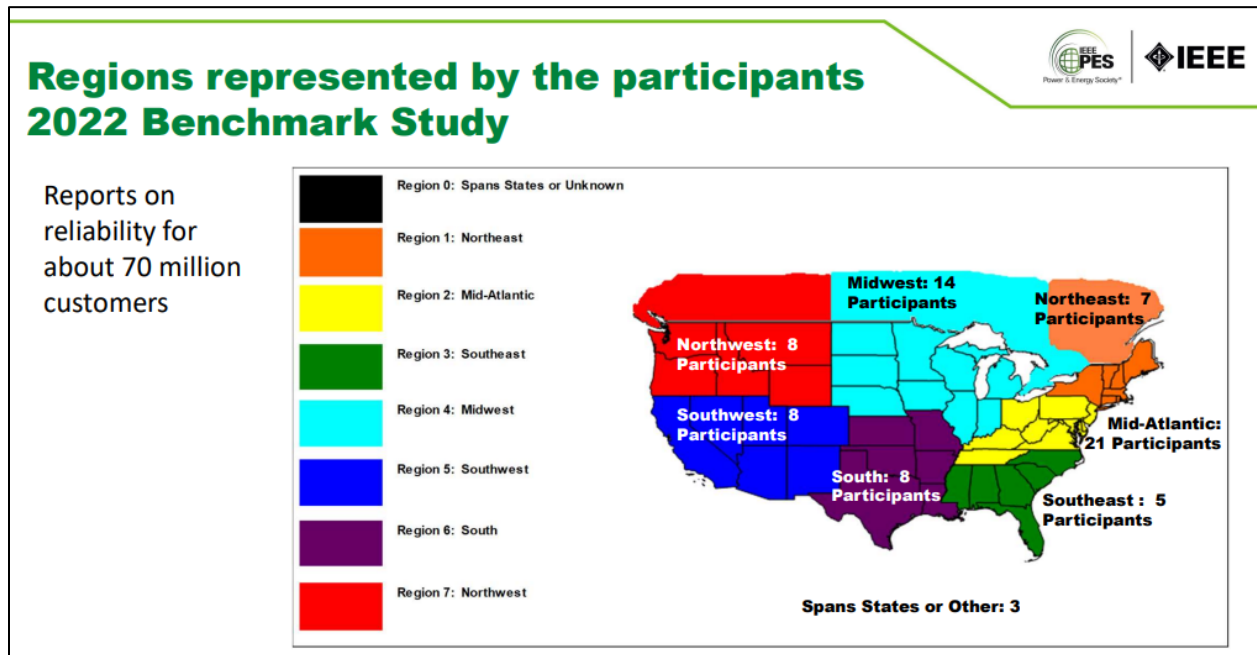


Figure 11: IEEE Benchmarking Participants

C. Minn. Rule 7826.0500 Annual Reliability Reporting

Per Subpart 1 of Minn. Rule 7826.0500, [o]n or before April 1 of each year, each utility shall file a report on its reliability performance during the last calendar year. This report shall include at least the following information:

- A. the utility's SAIDI for the calendar year, by work center and for its assigned service area as a whole;
- B. the utility's SAIFI for the calendar year, by work center and for its assigned service area as a whole;
- C. the utility's CAIDI for the calendar year, by work center and for its assigned service area as a whole;

- D. an explanation of how the utility normalizes its reliability data to account for major storms;*
- E. an action plan for remedying any failure to comply with the reliability standards set forth in part 7826.0600 or an explanation as to why noncompliance was unavoidable under the circumstances;*
- F. to the extent feasible, a report on each interruption of a bulk power supply facility during the calendar year, including the reasons for interruption, duration of interruption, and any remedial steps that have been taken or will be taken to prevent future interruption;*
- G. a copy of each report filed under part 7826.0700;*
- H. to the extent technically feasible, circuit interruption data, including identifying the worst performing circuit in each work center, stating the criteria the utility used to identify the worst performing circuit, stating the circuit's SAIDI, SAIFI, and CAIDI, explaining the reasons that the circuit's performance is in last place, and describing any operational changes the utility has made, is considering, or intends to make to improve its performance;*
- I. data on all known instances in which nominal electric service voltages on the utility's side of the meter did not meet the standards of the American National Standards Institute for nominal system voltages greater or less than voltage range B;*
- J. data on staffing levels at each work center, including the number of full-time equivalent positions held by field employees responsible for responding to trouble and for the operation and maintenance of distribution lines; and*
- K. any other information the utility considers relevant in evaluating its reliability performance over the calendar year.*

Minnesota Power provides the required information in the following sections.

- 1. Subp. 1.A through 1.C. The utilities SAIDI, SAIFI, CAIDI for the calendar year, by work center and for its assigned service area as a whole.**

In addition to the information required by Subpart 1. A through C, the information required in Order Point 2 of Docket No. E015/M-19-254 is provided in Table 10.

Table 10: SAIDI, SAIFI, CAIDI by Overall & Work Centers

		Overall	Central	Northern	Western
<i>Reporting Requirement</i>	Customer Counts⁷	143,473	77,821	23,006	42,646
Subp. 1.A.	Overall SAIDI	496.57	332.27	332.03	885.16
	Normalized SAIDI	112.70	94.77	121.10	140.89
	Major Event Excluded SAIDI	383.87	237.50	210.93	744.27
Subp. 1.B.	Overall SAIFI	2.05	1.72	1.43	2.98
	Normalized SAIFI	1.12	0.96	0.89	1.53
	Major Event Excluded SAIFI	0.93	0.76	0.54	1.45
Subp. 1.C.	Overall CAIDI	242.27	193.18	232.19	297.03
	Normalized CAIDI	100.89	98.72	136.07	92.08
	Major Event Excluded CAIDI	412.76	312.50	390.61	513.29
Doc. E015/M-19-254 Order Pt. 2	Overall MAIFI	4.84	4.80	2.50	6.20
	Normalized MAIFI	3.46	3.73	1.85	3.85
	Major Event Excluded MAIFI	1.38	1.07	0.65	2.35
Doc. E015/M-19-254 Order Pt. 2	Overall ASAI	99.91%	99.94%	99.94%	99.83%
	Normalized ASAI	99.98%	99.98%	99.98%	99.97%
	Difference in ASAI	0.07%	0.04%	0.04%	0.14%

⁷ As determined by service points.

2. Subp. 1.D. An explanation of how the utility normalizes its reliability data to account for major storms:

In 2022, there were six major events excluded based on the 2.5 beta method defined by the IEEE Standard for Distribution Reliability. The normalization process is designed to remove all outage records attributed to a specific major event, such as a large storm.

At Minnesota Power, normalization is performed only when the following criterion is met for a major event:

Event SAIDI is greater than the Threshold for an IEEE Major Event

As storms occur, customers can use the online app or call into Minnesota Power representatives and/or the Interactive Voice Response (“IVR”) system to report outages. Customers can also use the Company’s outage app to enter outages as they occur. Those calls and entries, along with the Company’s AMI meters reporting an outage, are then used to create trouble orders using a prediction engine within the Outage Management System (“OMS”). That information, along with information from other sources, is entered into a database for comparison. Often, events will have been detected by multiple sources. Duplications are eliminated and an accurate time, duration and customer count for each event is recorded.

Once all data streams have been combined and duplications have been eliminated, the resulting database is analyzed by the Reliability Engineer. The database is queried to look for timeframes when the Company SAIDI has incurred an incremental increase above the Threshold for Major Event. When sets of data are discovered that meet the criterion discussed above, that data is flagged and set aside - what remains is Minnesota Power’s Major Event Normalized Data.

Threshold for Major Event Day calculation description

A threshold for a major event day (“ T_{med} ”) is computed once per year. First, data is assembled for the five most recent years of historical values of daily SAIDI. Any day with a SAIDI value of zero is discarded. Then, the natural log of each SAIDI value is computed and the average (“alpha”) and standard deviation (“beta”) of the natural logarithms is

computed. The major event threshold can then be found by using this equation: $T_{med} = \exp(\alpha + 2.5 \cdot \beta)$. If any event in the next year has SAIDI greater than T_{med} , it qualifies as a major event. Note: that a Major Event is not limited to a single day and may span consecutive days, depending on the severity and duration of the event.

As stated earlier, major event normalization is designed to exclude data from rare, major events that may skew the overall data. In the last five years, there was generally an average of one to three Major Events excluded each year. Six Major Events were excluded in 2022.

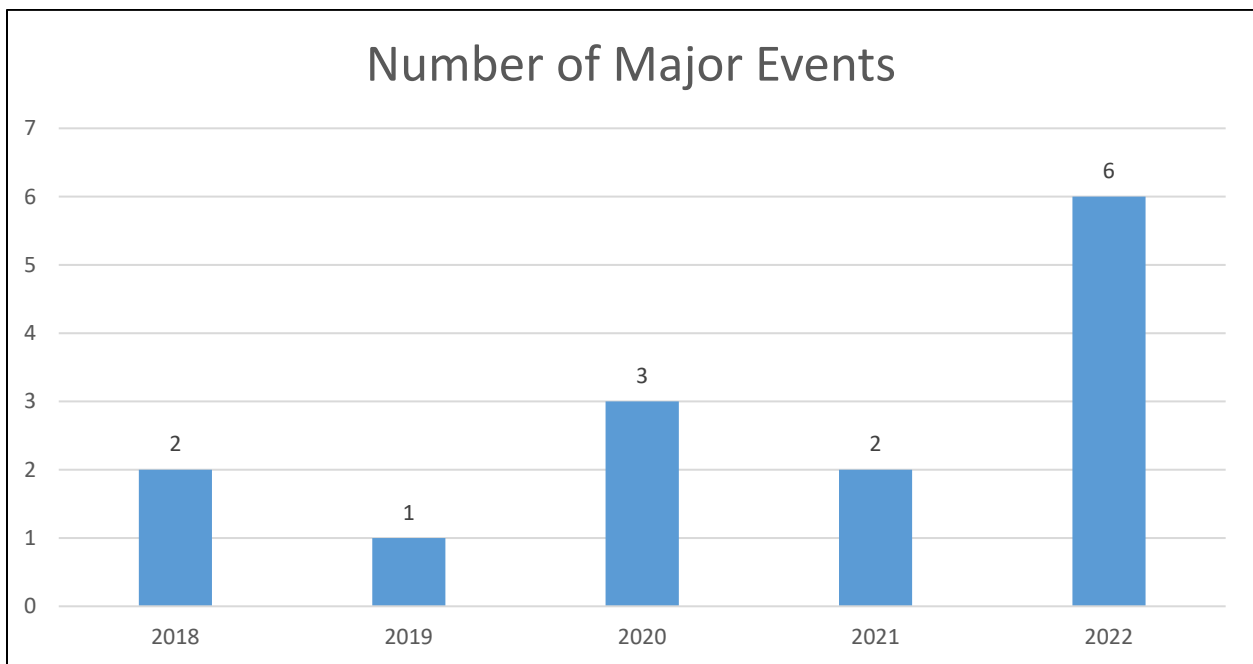


Figure 12: Major Event Totals by Year

3. Subp. 1.E. An action plan for remedying any failure to comply with the reliability standards set forth at part 7826.0600 or an explanation as to why non-compliance was unavoidable under the circumstances:

Minnesota Power did meet the Commission thresholds for Overall Company. The three Work Centers met the Commission thresholds for SAIDI, but the Northern Work Center exceeded the CAIDI threshold and the Western Work Center exceeded the SAIFI threshold. The majority of the outages throughout 2022 were attributed to weather, vegetation, and equipment failure. The Company increased focus on distribution

equipment maintenance and replacement in 2018 and will continue to develop these programs into the future. Two assistant engineers were hired in May 2017 to develop a trouble order tracking and remediation system which was put in place in Q4 of 2018. These assistant engineers also began implementation of a switch replacement blanket and commenced auditing of the Company’s system in order to develop an asset management preventative maintenance program throughout the Company’s service territory. This preventative maintenance program should increase the reliability of Minnesota Power’s distribution assets going forward. In 2020, an inspection app was created for line workers to inspect and address issues while out in the field. By inspecting lines on an ongoing basis, the Company hopes to find and address issues that will lead to better reliability performance in the future. In 2021, another assistant engineer was added to the distribution department to focus on maintenance. Additionally, a grid modernization team was developed to plan and execute projects that are tied to reliability betterment and resiliency. In 2022, the grid modernization team was refined by assigning specific roles and responsibilities to each member.

4. Subp. 1.F. To the extent technically and administratively feasible, a report on each interruption of a bulk power supply facility during the calendar year, including the reasons for interruption, duration of interruption, and any remedial steps that have been taken or will be taken to prevent future interruption:

Table 11: List of Interruptions to Bulk Power Supply Facilities

Feeder	Date	Duration (Minutes)	Cause
198 Line (Bear Creek)	5/30/2022	125	Weather
198 Line (Bear Creek)	7/10/2022	81	Weather
198 Line (Bear Creek)	8/10/2022	21	Underground Equipment
198 Line (Bear Creek)	12/14/2022	50	Weather
198 Line (Bear Creek)	12/19/2022	293	Weather
23 Line (Bear Creek)	5/26/2022	19	Vegetation
23 Line (Bear Creek)	12/14/2022	65	Weather
23 Line (Bear Creek)	12/15/2022	114	Weather
23 Line (Bear Creek)	12/15/2022	20	Weather
23 Line (Bear Creek)	12/21/2022	49	Weather

Feeder	Date	Duration (Minutes)	Cause
23 Line (Thomson)	12/14/2022	326	Weather
32 Line (Tower-Winton)	6/25/2022	58	Weather
33 Line (Winton)	6/25/2022	518	Weather
59 Line (Mahtowa- Sandstone)	7/10/2022	104	Weather
59 Line (Mahtowa- Sandstone)	12/14/2022	57	Weather
59 Line (Mahtowa- Sandstone)	12/15/2022	214	Weather
59 Line (Mahtowa- Sandstone)	12/15/2022	160	Weather
59 Line (Mahtowa- Sandstone)	12/15/2022	21	Weather
59 Line (Mahtowa- Sandstone)	12/15/2022	155	Weather

Refer to Appendix A for remedial steps taken for each interruption reported.

5. Subp. 1.G. A copy of each report (major service interruptions) filed under part 7826.0700;

These reports are provided as Appendix A to this Report.

6. Subp. 1.H. To the extent technically feasible, circuit interruption data, including identifying the worst performing circuit in each work center, stating the criteria the utility used to identify the worst performing circuit, stating the circuit’s SAIDI, SAIFI, and CAIDI, explaining the reasons that the circuit’s performance is in last place, and describing any operational changes the utility has made, is considering, or intends to make to improve its performance.

Section H requires that Minnesota Power report on the Company’s worst performing circuit for each work center. Within previous SRSQ filings, Minnesota Power has responded as one work center. Per Order Point 4 of the March 2, 2022 Order, the Company will report three Work Centers (Central, Northern, and Western). To maintain consistency with past filings, rather than listing only one feeder, the four worst performing feeders (2 urban and 2 rural) are identified in each Work Center. This is done in recognition of how reliability indices are affected by differing characteristics of feeder length and quantity of customers.

The feeder evaluation process utilized high Feeder SAIDI and high total customer-minutes of outage (i.e. # customers X SAIDI) as criteria for selection of two urban and two rural feeders. The following table clarifies the selections.

Table 12: Worst Performing Feeders Using Major Event Normalized Data by Work Center - Central

Central					
Criteria	Circuit Name	# of Customers	SAIDI	SAIFI	CAIDI
High Feeder SAIDI (Urban)	Hinckley West 461	585	701.77	5.11	137.33
High Customer Outage Minutes (Urban)	Gary 201	1307	404.36	1.14	354.70
High Feeder SAIDI (Rural)	Hinckley West 462	334	660.88	5.07	130.35
High Customer Outage Minutes (Rural)	Sandstone 452	1248	450.56	3.63	124.12

The December storm was the primary cause for the poor performance, followed by vegetation, equipment failures, and public damage. The storm caused ice and heavy snow to bend and break trees into these feeders. Minnesota Power’s vegetation group has been involved and will be working towards improvements. The Hinckley West substation has been rebuilt and completed in 2022. Two of the newly installed voltage regulators sustained failures and have since been replaced. The Company will be looking for opportunities for strategic undergrounding to enhance storm resiliency.

Table 13: Worst Performing Feeders Using Major Event Normalized Data by Work Center - Northern

Northern					
Criteria	Circuit Name	# of Customers	SAIDI	SAIFI	CAIDI
High Feeder SAIDI (Urban)	St. Croix 1	161	573.23	1.35	424.61
High Customer Outage Minutes (Urban)	Hat Trick 321	1669	121.49	0.95	127.88
High Feeder SAIDI (Rural)	Nashwauk 318	28	1037.61	8.43	123.09
High Customer Outage Minutes (Rural)	Lind Greenway 334	870	451.74	3.24	139.43

Weather, wildlife, and vegetation are the leading causes of these feeders' poor performance. Nashwauk 318 and several of its stepdown feeders are scheduled to be cleared of vegetation in 2023. Not only will this reduce vegetation-related outages but it will also limit wildlife contact. The Northern Engineering team is building and reviewing a plan that could include feeder improvements to reconfigure, use strategic undergrounding, add additional feeds into this area, and add feeder automation to the rural feeders above.

Table 14: Worst Performing Feeders Using Major Event Normalized Data by Work Center - Western

Western					
Criteria	Circuit Name	# of Customers	SAIDI	SAIFI	CAIDI
High Feeder SAIDI (Urban)	Cotton Tail Drive 1	54	636.94	3.02	210.91
High Customer Outage Minutes (Urban)	Long Lake 541	1705	216.95	2.67	81.25
High Feeder SAIDI (Rural)	Walker Sub 2 Fdr 1	632	605.96	4.93	122.91
High Customer Outage Minutes (Rural)	Walker Sub 2 Fdr 1	632	605.96	4.93	112.91

Weather, equipment failures, and planned outages were the leading causes of these feeders' poor performance. The Company has started 2023 strategic undergrounding projects to aid in storm resiliency. Additionally, the Company is continuing the asset management program to find, repair and replace equipment on its system.

7. Subp. 1.I. Data on all known instances in which nominal electric service voltages on the utility's side of the meter did not meet the standards of the American National Standards Institute for nominal system voltages greater or less than voltage range B.

There were 16 reported instances of ANSI voltage violations in 2022. They were caused by weather, vegetation, overhead and underground equipment.

Table 15: Reported Instances of ANSI Voltage Violations 2022

Date	Cause	Voltages		
		Line to Ground	Line to ground	Line to Line
5/31/2022	Vegetation	90	140	240
6/3/2022	Weather	105	138	244
6/20/2022	Underground Equipment	120	90	211
6/21/2022	Vegetation	60	60	120
6/22/2022	Underground Equipment	120	60	120
6/22/2022	Weather	123	246	217
6/23/2022	Underground Equipment	135	105	240
6/24/2022	Overhead Equipment	350	280	280
7/6/2022	Overhead Equipment	105	105	210
10/27/2022	Unknown	122	122	212
11/11/2022	Overhead Equipment	120	0	21
11/16/2022	Unknown	278	66	278
11/30/2022	Unknown	122	122	90
12/16/2022	Vegetation	100	100	200
12/18/2022	Underground Equipment	99	145	244
12/22/2022	Weather	90	90	240

8. Subp. 1.J. Data on staffing levels at each work center, including the number of full-time equivalent positions held by field employees responsible for responding to trouble and for the operation and maintenance of distribution lines.

Prior to the 2020 filing, Minnesota Power reported as one Work Center and only provided the total numbers for Line Operations Field Workers and Contractors that worked on the Distribution System. Shown below are updated numbers that also include support for field

workers and engineering support for construction, maintenance and storm response. Though the Central Work Center⁸ shows more employees, many of those individuals assist or concentrate their efforts across the entire service territory.

The Line Operations Field Workers include outdoor field support that provide construction, maintenance, and trouble response on the distribution system. This group includes Line workers, Substation technicians, Relay technicians, and Communication Infrastructure technicians.

The Line Operations Support employees include the area Supervisors, Operations Planning and Scheduling employees, System Operators, Vegetation Management employees, Service Dispatch employees, Inventory employees, and Fleet Mechanics.

Engineering Support includes engineers, designers, administrative employees, meter employees, and Geographical Information System specialists responsible for the construction and maintenance of the system. These employees can also be called upon for larger storm events as part of the Company's Emergency Response Plan. If the event is large enough, such as the July 2016 storm, the Company will call mutual aid from other EEI member utilities.

Contractors are seasonal at-hire individuals that perform line construction and maintenance, vegetation management, and ground line inspections on the system. Most of these contractors are hired over the spring, summer, and fall months to help with the peak working conditions once the snow has melted. These employees work across Minnesota Power's entire service territory and cannot be grouped into individual work centers.

⁸ The Central work center customer count is largest at over 77,800, in comparison to the Northern work center which is over 23,000 and the Western work center at about 42,600.

Table 16: Employees by Work Center

2022 Support	Central	Northern	Western
Line Operations Field Workers	Line – 49 Sub – 8	Line – 25 Sub – 8	Line – 30 Sub – 5
Line Operations Support	OPS – 1 Line – 9 Fleet – 9 Sub – 2 Inv – 7	OPS – 1 Line – 1 Fleet – 3 Sub – 1 Inv – 3	OPS – 1 Line – 2 Fleet – 3 Inv – 3
	Service Dispatch – 8 System Operations – 20 Vegetation Management – 3		
Engineering Support	Dist – 24 Meter – 13 GIS – 9	Dist – 7 Meter – 1 GIS – 1	Dist – 7 Meter – 4 GIS – 1
	Transmission – 6 Substation – 18		
Contractors	Line – 25 Groundline – 10 Vegetation – 68		

9. Subp. 1.K. Any other information the utility considers relevant in evaluating its reliability performance over the calendar year.

CEMI

Table 17: Percentage of Customers Experiencing Repeated Interruptions by Work Center

2022	Central		Northern		Western	
	Storm Included	Storm Excluded	Storm Included	Storm Excluded	Storm Included	Storm Excluded
+6	7.38%	0.00%	0.12%	0.12%	4.92%	0.00%
+5	4.00%	2.15%	0.00%	0.00%	7.33%	0.02%
+4	0.00%	0.00%	7.01%	0.44%	8.22%	2.81%
+3	6.35%	4.84%	10.12%	3.78%	19.85%	11.06%

The highest CEMI feeder for overall outage data within the Central Work Center was Askov 6521 with 5.39 outages, within the Northern Work Center was Nashwauk 318 with

8.43 outages, and within the Western Work Center was Sylvan H.E. 502 with 5.50 outages.

CELI

Table 18: Percentage of Customers Experiencing Long Outage Durations by Work Center

2022	Central		Northern		Western	
	Storm Included	Storm Excluded	Storm Included	Storm Excluded	Storm Included	Storm Excluded
6 hr.	6755	2155	5615	860	18283	397
%	8.68%	2.77%	24.41%	3.74%	42.87%	0.93%
12 hr.	5030	98	891	10	10078	18
%	6.46%	0.13%	3.87%	0.04%	23.63%	0.04%
24 hr.	2474	10	377	0	3037	12
%	3.18%	0.01%	1.64%	0.00%	7.12%	0.03%

Within the Central Work Center, the longest customer outage duration was 5,714 minutes. This outage entry affected one customer. It occurred on the first day of a three day excluded winter storm. This area saw freezing rain and heavy snow that caused trees to repeatedly break through all of the area feeders.

Within the Northern Work Center, the longest customer outage duration was 3,818 minutes. This outage entry affected one customer. It occurred during an excluded summer storm when the wind caused a tree to contact and burn the service transformer fuse. The crew removed the tree, inspected the service and restored power.

Within the Western Work Center, the longest customer outage duration was 4,850 minutes. This outage entry affected one customer. It occurred during an excluded summer storm when wind pushed a tree into their service. The crew removed the tree, inspected the service and restored power.

Table 19: Reliability Performance by Customer Class

Customer Class Reliability		ASAI	SAIDI	SAIFI	CAIDI	MAIFI
Residential	Non-normalized	99.91%	422.36	1.74	242.73	4.12
	Normalized	99.98 %	95.86	0.95	100.90	2.94
Commercial	Non-normalized	99.98%	73.99	0.31	238.67	0.72
	Normalized	99.99%	16.79	0.17	98.76	0.52
Industrial	Non-normalized	99.99%	1.19	0.00	N/A	0.01
	Normalized	99.99%	0.27	0.00	N/A	0.01

Estimated Time of Restoration Data

In compliance with Order Point 2 of the January 28, 2020 Order in the 2018 SRSQ Report (Docket No. E015/M-19-254), Minnesota Power provides the estimated restoration time using the specified windows.

Table 20: Estimated Time of Restoration Accuracy

2022		Initial			Final		
ETRs used		0->+30	-90->0	>+30 or <-90	0->+30	-90->0	>+30
Totals	11344	555	881	9908	138	0	9770
Percentages	100%	4.89%	7.77%	87.34%	1.22%	0.00%	98.78%

Table 20 is the breakdown of Estimated Times of Restoration (“ETR”) in the OMS. This shows the accuracy of the ETRs used on trouble orders throughout the year. Initial ETRs were deemed to be over 87 percent accurate and final ETRs were over 98 percent accurate.

VI. Meter-Reading Performance

Per Minn. Rule 7826.1400, the annual service quality report must include a detailed report on the utility's meter-reading performance, including, for each customer class and for each calendar month:

- A. the number and percentage of customer meters read by utility personnel;
- B. the number and percentage of customer meters self-read by customers;
- C. the number and percentage of customer meters that have not been read by utility personnel for periods of six to 12 months and for periods of longer than 12 months, and an explanation as to why they have not been read; and
- D. data on monthly meter-reading staffing levels, by work center or geographical area.

Table 21 provides an overview of the Company's meter equipment and its deployment across the Minnesota Power distribution system. A blend of metering technology has been used, with thoughtful deployments as technology advancements have become available and/or end of life is reached on existing infrastructure. For example, AMR technology was installed beginning in 2002 and has allowed for automated meter reading with minimal manual read routes needed. Similarly, MV90 and AMI devices provide for automated meter reading. AMI installations, which have two-way communications and other expanded functionality, began in 2009, with conversion expected to be completed in 2023. As such, in reporting statistics regarding meters read by utility personnel, this includes reads obtained through these technologies and that did not require manual reads. Generally speaking, manual reads are only required in instances where meter signal is challenged by location or environmental factors, where consecutive estimates have occurred, or in instances where a customer opts out of AMI.

Table 21: Meter Equipment and Percentage Deployed

Equipment	Percent in Use ⁹	Description
Mechanical Meters	0.00%	Traditional electro-mechanical meter that records kWh usage.
AMR – Mechanical Hybrid	0.13%	Traditional electro-mechanical meters that are retrofitted with a one-way electronic automatic meter reading (“AMR”) module capable of reporting multiple quantities including kWh, kW, and outage count.
AMR – Solid State	0.0%	Modern Solid State electronic meters integrated with a one-way AMR module or retrofitted with an external AMR unit. Capable of reporting multiple quantities including kWh, kVARh, kW, and outage count.
AMI – Solid State	99.68%	Modern solid state devices integrated with a two-way AMI communication module. Capable of multiple measurement functions including Time of Use (TOU), kW, kWh, KVA, kVAh, kVAR, kVARh, instantaneous and average voltage, two channel load profile, and remote disconnect. Also capable of remote firmware, program, and display updates.
MV-90	0.18%	A software system produced by Itron that is used to interrogate a wide variety of meters and recorders using telephone communication and modems to obtain both meter readings and meter interval data generally from commercial and industrial customers.

A. Numbers and percentages of customer meters read by utility personnel

In 2022, Minnesota Power read an average of 99.66 percent of residential meters, 99.90 percent of commercial meters, 99.98 percent of industrial, 99.88 percent municipal pumping, and 100.00 percent lighting meters.

⁹ As of 1/1/2023.

Table 22: Residential Meter Reads – Utility 2022

Month	Company Reads	Est	Total	% Read
Jan-22	131,504	1022	132,526	99.23%
Feb-22	123,493	963	124,456	99.23%
Mar-22	132,626	776	133,402	99.42%
Apr-22	131,834	390	132,224	99.71%
May-22	132,099	516	132,615	99.61%
Jun-22	132,762	365	133,127	99.73%
Jul-22	131,524	387	131,911	99.71%
Aug-22	143,409	248	143,657	99.83%
Sep-22	119,520	211	119,731	99.82%
Oct-22	143,750	170	143,920	99.88%
Nov-22	119,592	122	119,714	99.90%
Dec-22	130,933	226	131,219	99.83%
Average	131,092	450	131,542	99.66%

In 2022, Minnesota Power read an average of 99.90 percent of commercial meters.

Table 23: Commercial Meter Reads – Utility 2022

Month	Company Reads	Est	Total	% Read
Jan-22	22,010	15	22,025	99.93%
Feb-22	20,801	21	20,822	99.90%
Mar-22	22,365	29	22,394	99.87%
Apr-22	21,961	32	21,993	99.85%
May-22	21,918	28	21,946	99.87%
Jun-22	22,047	22	22,069	99.90%
Jul-22	22,157	25	22,182	99.89%
Aug-22	24,015	24	24,039	99.90%
Sep-22	20,773	8	20,781	99.96%
Oct-22	23,627	12	23,639	99.95%
Nov-22	20,822	11	20,833	99.95%
Dec-22	20,612	26	20,638	99.87%
Average	21,926	21	21,947	99.90%

In 2022, Minnesota Power read an average of 99.98 percent of industrial meters.

Table 24: Industrial Meter Reads – Utility 2022

Month	Company Reads	Est	Total	% Read
Jan-22	320	0	320	100.00%
Feb-22	500	0	500	100.00%
Mar-22	506	0	506	100.00%
Apr-22	526	1	527	99.81%
May-22	528	0	528	100.00%
Jun-22	527	0	527	100.00%
Jul-22	581	0	581	100.00%
Aug-22	515	0	515	100.00%
Sep-22	497	0	497	100.00%
Oct-22	493	0	493	100.00%
Nov-22	514	0	514	100.00%
Dec-22	436	0	436	100.00%
Average	495	0	495	99.98%

In 2022, Minnesota Power read an average of 99.88 percent of municipal meters.

Table 25: Municipal Meter Reads – Utility 2022

Month	Company Reads	Est	Total	% Read
Jan-22	267	0	267	100.00%
Feb-22	224	0	224	100.00%
Mar-22	315	1	316	99.68%
Apr-22	268	0	268	100.00%
May-22	269	0	269	100.00%
Jun-22	270	0	270	100.00%
Jul-22	276	0	276	100.00%
Aug-22	277	1	278	99.64%
Sep-22	278	1	279	99.64%
Oct-22	271	1	272	99.63%
Nov-22	271	0	271	100.00%
Dec-22	199	0	199	100.00%
Average	265	0	266	99.88%

In 2022, Minnesota Power read an average of 100.00 percent of lighting meters.

Table 26: Lighting Meter Reads – Utility 2022

Month	Company Reads	Est	Total	% Read
Jan-22	373	0	373	100.00%
Feb-22	363	0	363	100.00%
Mar-22	380	0	380	100.00%
Apr-22	371	0	371	100.00%
May-22	374	0	374	100.00%
Jun-22	376	0	376	100.00%
Jul-22	375	0	375	100.00%
Aug-22	417	0	417	100.00%
Sep-22	354	0	354	100.00%
Oct-22	395	0	395	100.00%
Nov-22	350	0	350	100.00%
Dec-22	364	0	364	100.00%
Average	370	0	370	100.00%

B. Numbers and percentages of customer meters self-read by customers

Residential customer reads averaged 0.04 percent of the system total in 2022, of those Minnesota Power received an average of 98.70 percent of reads.

Table 27: Residential Meter Reads - Self-Read 2022

Month	Cust Reads	Est	Total	% Read
Jan-22	56	2	58	96.55%
Feb-22	53	1	54	98.15%
Mar-22	60	1	61	98.36%
Apr-22	61	0	61	100.00%
May-22	59	0	59	100.00%
Jun-22	57	1	58	98.28%
Jul-22	57	2	59	96.61%
Aug-22	64	1	65	98.46%
Sep-212	51	0	51	100.00%
Oct-22	67	0	67	100.00%
Nov-22	49	1	50	98.00%
Dec-22	58	0	58	100.00%

Commercial customer reads averaged 0.01 percent of the system total in 2022, of those Minnesota Power received an average of 100.00 percent of reads.

Table 28: Commercial Meter Reads – Self-read 2022

Month	Cust Reads	Est	Total	% Read
Jan-22	12	0	12	100.00%
Feb-22	12	0	12	100.00%
Mar-22	13	0	13	100.00%
Apr-22	12	0	12	100.00%
May-22	12	0	12	100.00%
Jun-22	13	0	13	100.00%
Jul-22	13	0	13	100.00%
Aug-22	12	0	12	100.00%
Sep-22	13	0	13	100.00%
Oct-22	14	0	14	100.00%
Nov-22	13	0	13	100.00%
Dec-22	13	0	13	100.00%

C. Number and percentage of customer meters that have not been read by utility personnel for periods of six to twelve months and for periods of longer than twelve months, and an explanation as to why they have not been read.

Table 29: Meters Not Read 6-12 Months 2022

Months Estimated	Company Read Service Points	% of Total	Not Read Reason	Customer Read Service Points	% of Total
6 Months	3	0.002%	No Access/AMR	0	0.000%
7 Months	6	0.004%	No Access/AMR	0	0.000%
8 Months	5	0.003%	No Access/AMR	0	0.000%
9 Months	1	0.001%	No Access/AMR	0	0.000%
10 Months	1	0.001%	No Access/AMR	0	0.000%
11 Months	0	0.000%	No Access/AMR	0	0.000%
12 Months	0	0.000%	No Access/AMR	0	0.000%
12+Months	0	0.000%	No Access/AMR	0	0.000%
Totals:	16			0	

Minnesota Rules 7820.3300 requires that meters are read monthly unless otherwise authorized by the commission. Customers with Company read meters that are not read for six to twelve months are left reminder notices at the premise and/or are sent reminder letters of the utility's need to access the meter. A similar process is used for customer read meters not read for over twelve months. In addition, phone calls are made to each customer in an attempt to schedule a meter reading. Disconnection warnings are issued for unresponsive accounts. In accordance with the Cold Weather Rule, no disconnections for unread meters are performed during the Cold Weather Rule months.

D. Data on monthly meter-reading staffing levels, by Service Center or geographical area

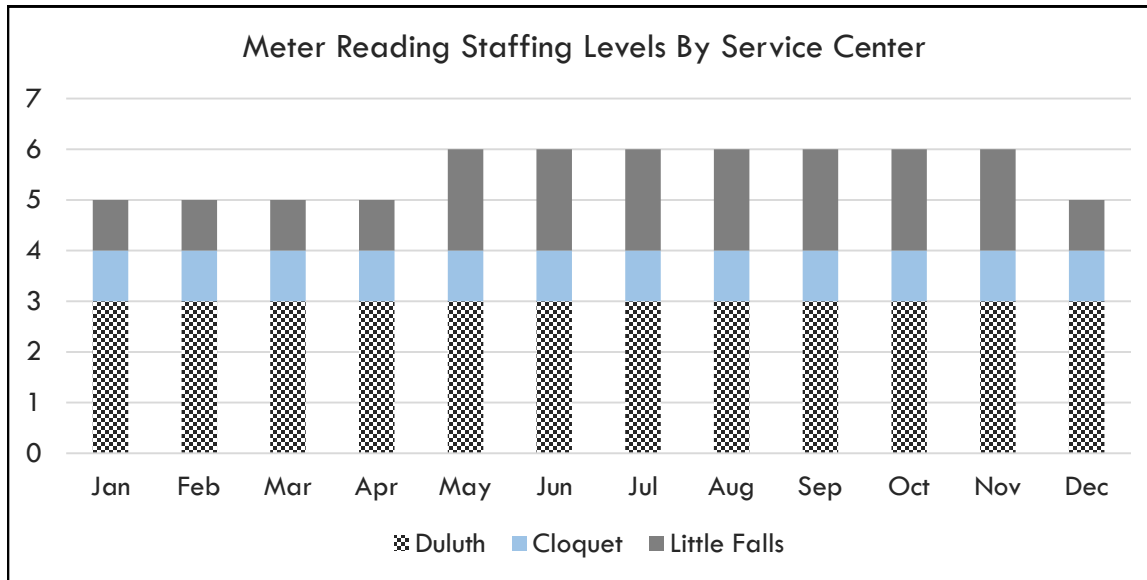


Figure 13: Meter-reading Staffing Levels by Service Center

VII. Customer Service Data

This section includes information submitted in compliance with the following:

- **Order Pts. 2, 3 & 4 of December 2, 2021 Order (Docket No. E015/M-21-230)**

Minnesota Power recognizes that, above all else, customers expect reliable, safe, and affordable electricity, as illustrated in the results from a survey of 800 Minnesota Power residential customers conducted by Rapp Strategies and shown in Figure 14.¹⁰ Inherent to each of these are quality customer interactions through a variety of channels (i.e. in person, in writing, via email, over the phone, online, through social media, and in the field). Further, convenience, transparency about services, timely updates regarding interruption to services, and clarity about costs and program offerings are essential to the customer experience.

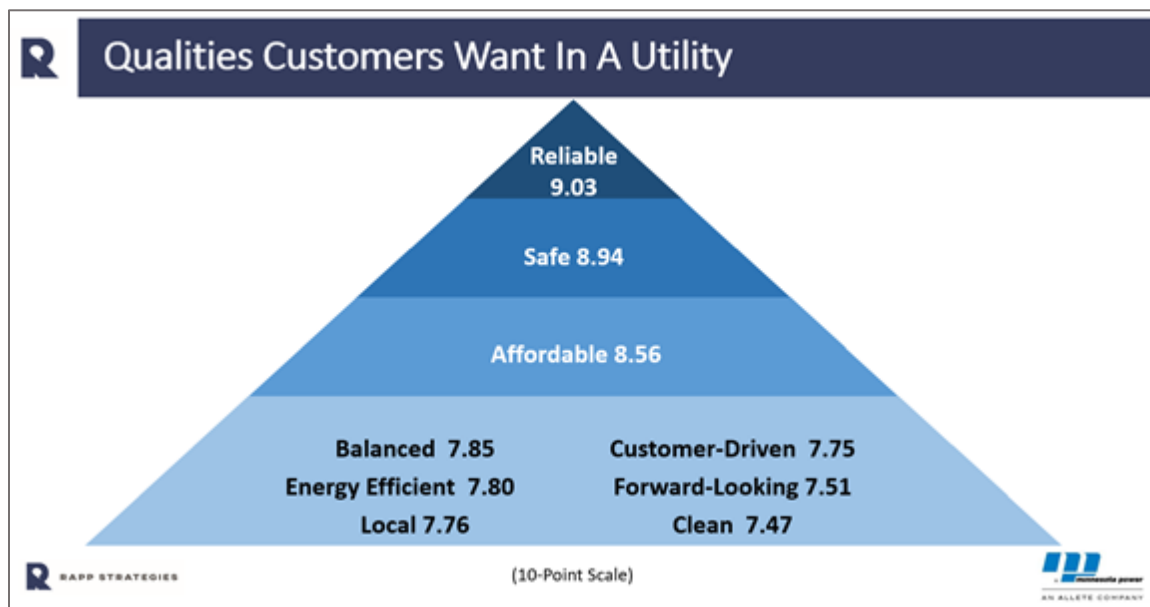


Figure 14: Customer Expectations

A. Customer Care

Minnesota Power's approach is to continue to provide core customer services such as establishing and maintaining service, accurate and timely billing, inquiry resolution, and

¹⁰ *Minn. Power Residential Customer Survey – Reputation*, RAPP STRATEGIES (2019).

general customer care as effectively as possible, while striving to meet or exceed formal service quality expectations related to response times for customer calls and establishing or restoring service in a timely manner.

Minnesota Power also seeks to leverage technology advances, where applicable and practical, to improve convenience and ensure a positive experience for customers, which means customer relations and the customer experience are always evolving. This is inclusive of day-to-day interactions between the Company and its customers through traditional channels such as the Company's Call Center, billing services, and in the field. It is also inclusive of emerging channels such as online tools, apps, and social media, all of which have proven to be effective options for requesting services and for receiving updates affecting services such as outages.

B. Customer Communication

In this section, Minnesota Power provides responses to the additional data request from Order Point 14 of the 2019 SRSQ Order. The Company appreciates the interest in other customer communication channels, particularly self-service options. This is something the Company commented on in its previous SRSQ filings under Docket Nos. E015/M-18-250 and E015/M-19-254, where Minnesota Power suggested that customer expectations and preferences regarding communication channels will ultimately need to be a point of consideration and reviewed as part of service quality reporting. These options will impact the types of calls the Call Center receives and challenge traditional response metrics such as Call Center response times. The tables below summarize yearly total of web site visits, including Facebook and Instagram daily page engaged users; yearly total number of logins via electronic customer communications platforms, including MyAccount logins, app installations, and app page views; and yearly total number of emails received, as determined by the Customer Service email address and related tracking tool.

Table 30: Customer Communication Data for 2022

Customer Communication Data for 2022					
	Web Site Pageviews ¹¹	MyAccount Electronic Self Service Logins	Mobile App Installations	Facebook Daily Page Engaged Users	Instagram Daily Page Engaged Users
January	125,941	62,875	456	712	31
February	109,422	60,933	410	545	31
March	123,191	86,848	505	646	36
April	135,186	130,628	504	915	38
May	251,716	77,003	1255	3166	46
June	180,175	57,625	718	1945	85
July	139,342	63,605	579	1173	84
August	146,914	62,263	623	900	87
September	134,914	65,233	477	1028	92
October	130,449	63,506	580	782	134
November	136,508	58,383	610	1045	219
December	265,741	61,221	1615	3386	203
Total:	1,879,499	850,123	8,332	16,243	1,086

The following table reflects the yearly number of emails received through CustomerService@mnpower.com, which would be indicative of general inquiries and relatively in line with how calls are tracked for the Call Center. This is the email address published on the Minnesota Power web site. Categorization by email subject is also provided using consistent wrap codes as those used for calls to the Call Center. The fuel assistance wrap code is indicative of energy assistance inquiries. There are also Customer Affordability of Residential Electricity (“CARE”) affordability program and disconnect/reconnect wrap codes for email, but these were nominal (less than 100) in 2022. These figures do not include other operational email distribution groups, direct emails to individual employees, or technical support emails through the online MyAccount tool, as those do not have an established tracking process or subject categorization methodology in place.

¹¹ www.mnpower.com.

Table 31: Total Number of Emails Received by Month 2022

Emails	
January	1,421
February	1,500
March	1,824
April	1,817
May	2,114
June	2,132
July	785
August	942
September	905
October	896
November	886
December	1,098
Total:	16,320

Categorization of email subject, which uses the same wrap codes used for calls to the Call Center, is as follows:

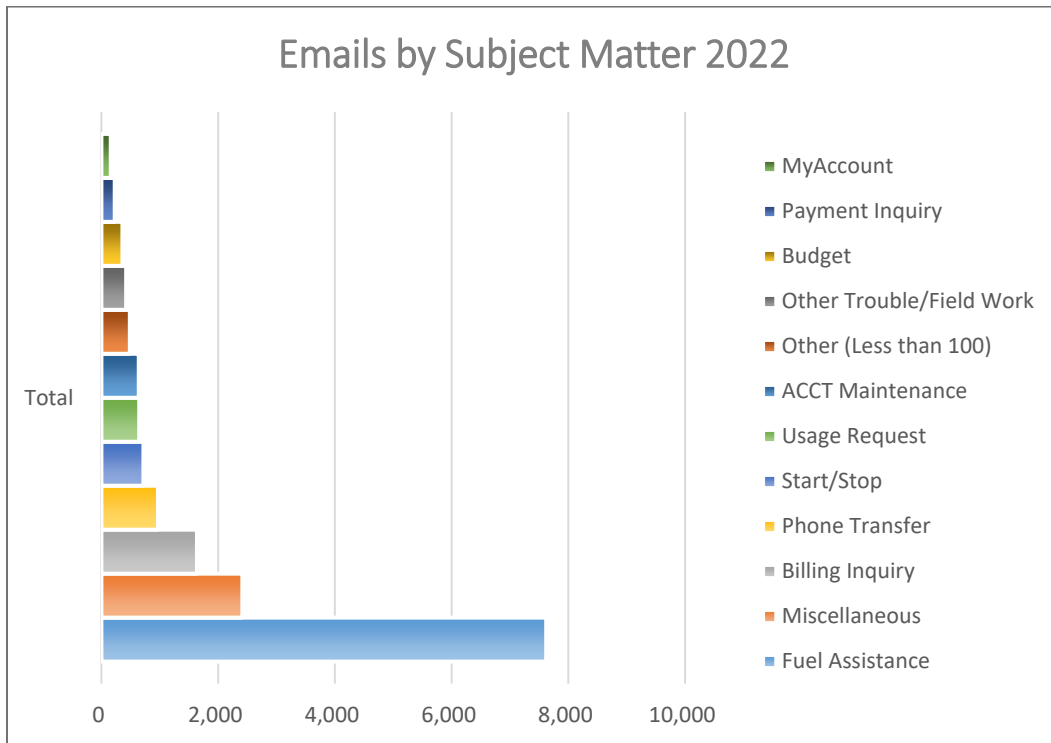


Figure 15: Email Wrap Codes

In accordance with Order Point 14 of the Commission’s December 2020 Order, the below tables show the percentage uptime and error rate for Minnesota Power website, outage reporting, outage map, Speedpay, and MyAccount.

Table 32: Percent Uptime on MNPower.com

2022 & Uptime on MNPower.com			
	Uptime	Downtime (minutes)	# of Outages causing Downtime
January	99.99%	6	4
February	100.00%	0	0
March	99.99%	1	1
April	99.99%	3	3
May	99.99%	6	3
June	100.00%	0	0
July	100.00%	0	0
August	99.98%	9	4
September	99.95%	23	10
October	99.98%	7	3
November	99.99%	1	1
December	99.96%	19	9
Total:	99.98%	75	38

Table 33: Percent Uptime on Outage Reporting Form

2022 & Uptime on Outage Reporting Form (MNPower.com)			
	Uptime	Downtime (minutes)	# of Outages Causing Downtime
January	100.00%	0	0
February	100.00%	0	0
March	100.00%	0	0
April	99.98%	7	6
May	100.00%	0	0
June	100.00%	0	0
July	100.00%	0	0
August	100.00%	0	0
September	100.00%	0	0
October	100.00%	0	0
November	100.00%	0	0
December	100.00%	0	0
Total:	100.00%	7	6

Table 34: Percent Uptime on Outage Map

2022 & Uptime on Outage Map (MNPower.com)			
	Uptime	Downtime (minutes)	# of Outages causing Downtime
January	100.00%	0	0
February	100.00%	0	0
March	100.00%	0	0
April	100.00%	0	0
May	100.00%	0	0
June	100.00%	0	0
July	100.00%	0	0
August	100.00%	0	0
September	100.00%	0	0
October	100.00%	0	0
November	100.00%	0	0
December	100.00%	0	0
Total:	100.00%	0	0

Table 35: Percent Uptime on Speedpay.com

2022 Uptime on Speedpay.com				
	Extranet	Internet	API	IVR
January	100.00%	99.99%	100.00%	100.00%
February	100.00%	100.00%	100.00%	100.00%
March	100.00%	100.00%	99.93%	100.00%
April	99.89%	99.90%	99.90%	99.90%
May	100.00%	100.00%	100.00%	100.00%
June	99.36%	99.36%	99.36%	99.36%
July	100.00%	99.99%	100.00%	100.00%
August	100.00%	100.00%	100.00%	100.00%
September	100.00%	100.00%	100.00%	100.00%
October	100.00%	100.00%	100.00%	100.00%
November	100.00%	100.00%	100.00%	100.00%
December	100.00%	100.00%	100.00%	98.39%
AVG:	99.94%	99.94%	99.93%	99.80%

Table 36: Percent Uptime on MyAccount

2022 Uptime on MyAccount
Uptime
99.99%

2022 Outages on MyAccount	
# of Outages	Total Minutes
17	40

VIII. Service Quality Performance Reporting

The information required to be reported Minnesota Rules 7826.1400 through 7826.2000 is provided on the following pages. Overall, the number of disconnection notices is slightly higher than pre-COVID-19 years; however, the transition plan for COVID-related customer protections extended into 2022. Despite the number of notices increasing, the number of customers actually disconnected was relatively consistent with pre-COVID-19 levels.

A. Reporting Involuntary Disconnections: Minnesota Rule 7826.1500

1. Number of customers who received disconnection notices.

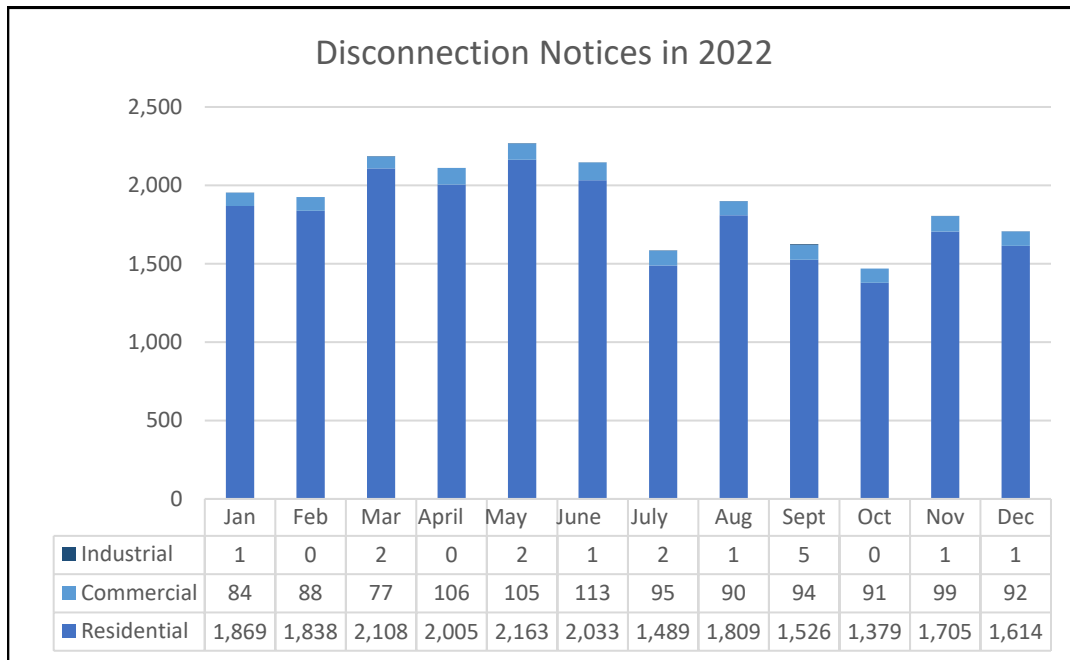


Figure 16: Disconnection Notices 2022

Table 37: Disconnection Notices in 2022

Total Disconnection Notices in 2022		
Residential	Commercial	Industrial
21,538	1,134	16

2. Number of customers who sought cold weather rule protection under chapter 7820 and the number who were granted cold weather rule protection

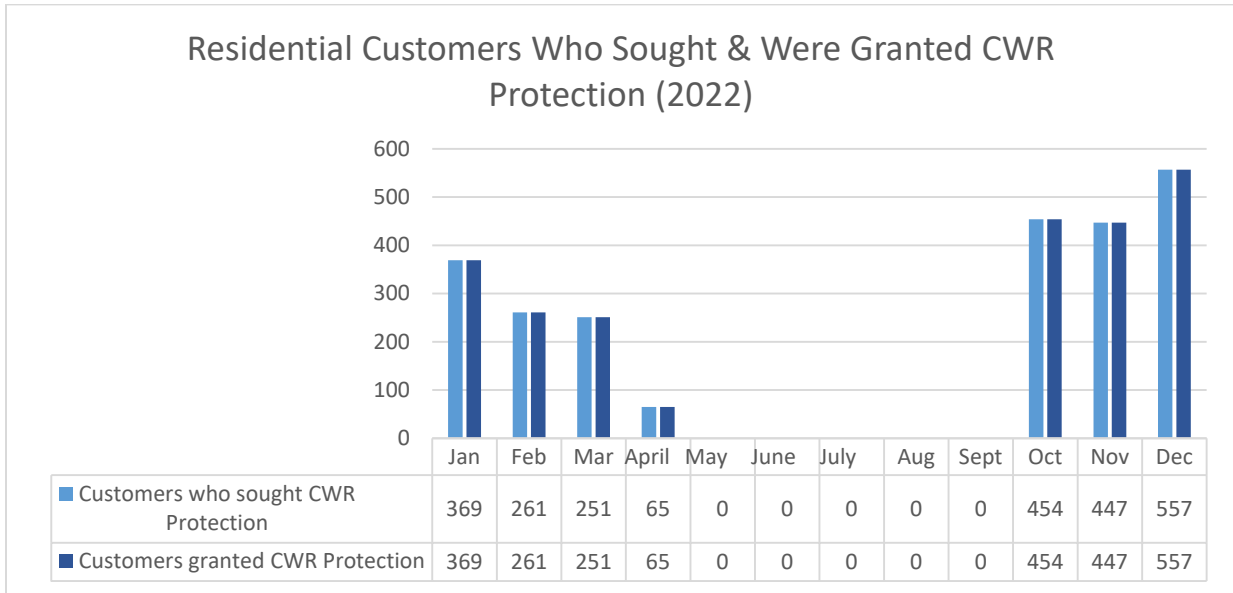


Figure 17: Customers Who Sought and were Granted CWR Protection 2022

Table 38: Total Residential Customers Who Sought & Were Granted CWR Protection

Total Residential Customers Who Sought CWR Protection	Total Residential Customers Granted CWR Protection
2,404	2,404

Minnesota Power granted Cold Weather Rule protection to 100 percent of customers who requested protection. The number of customers who requested Cold Weather Rule protections was down significantly when compared to pre-COVID-19 years. This is likely due to the expanded protections offered, and related extended payment plans.

3. The total number of customers whose service was disconnected involuntarily and the number of these customers restored to service within 24 hours

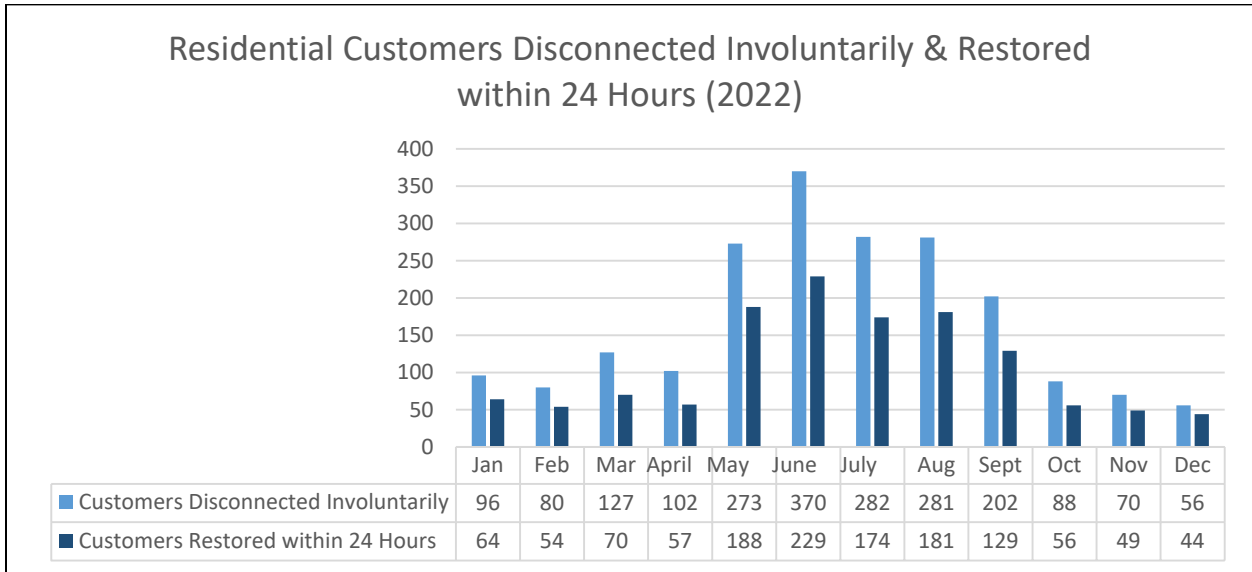


Figure 18: Residential Customers Disconnected Involuntarily & Restored w/in 24 Hours

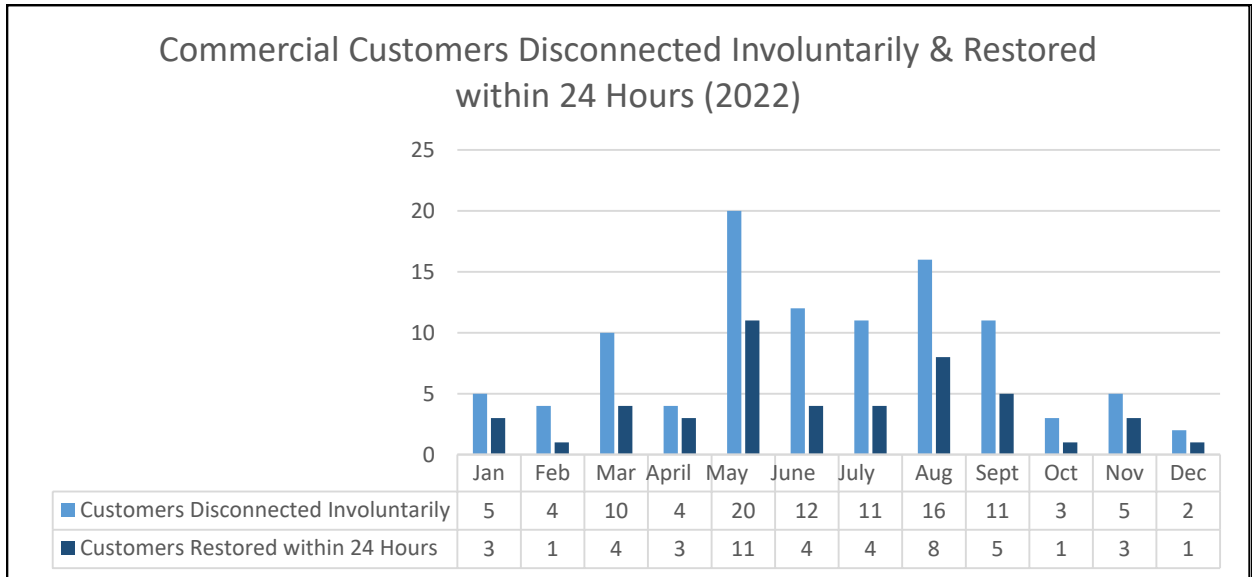


Figure 19: Commercial Customers Disconnected Involuntarily & Restored w/in 24 Hours

Table 39: Total Customers Disconnected Involuntarily and Restored w/in 24 Hours in 2022

Total Customers Disconnected Involuntarily			Total Customers Restored within 24 Hours		
Residential	Commercial	Industrial	Residential	Commercial	Industrial
2,027	103	0	1,295	48	0

4. The number of disconnected customers restored to service by entering into a payment plan

Table 40: Customers Restored Via Payment Plan 2022

Month	Residential	Commercial	Industrial
Jan	62	4	0
Feb	57	1	0
Mar	74	5	0
Apr	56	3	0
May	183	10	0
Jun	234	4	0
Jul	189	4	0
Aug	187	7	0
Sep	135	7	0
Oct	69	1	0
Nov	55	3	0
Dec	44	1	0

B. Reconnect Pilot Program

On December 2, 2019, Minnesota Power filed a new petition for a three-year remote reconnect pilot program in Docket No. E-015/M-19-766. This proposal was approved by the Commission on December 9, 2020.

Due to the economic impacts of the COVID-19 pandemic, and particularly in response to the issuance of the Governor’s Emergency Executive Order,¹² Minnesota Power voluntarily took several proactive measures to provide protections and enhance safety for employees, customers, and communities during the peacetime emergency. Part of these actions included suspension of disconnections for residential customers facing financial

¹² On March 13, 2020, Governor Tim Walz signed Emergency Executive Order 20-01, declaring a Peacetime Emergency and Coordinating Minnesota’s Strategy to Protect Minnesotans from COVID-19, as most recently extended through July 14, 2021 in Emergency Executive Order 21-24, https://mn.gov/governor/assets/EO%2021-24%20Final_tcm1055-485447.pdf. Governor Walz’s emergency powers ended on July 1, 2021.

hardship as a result of the coronavirus pandemic. In its August 13, 2020 Order under Docket No. E,G999/CI-20-375, the Commission ordered: suspension of disconnections for residential customers; suspension of negative reporting to credit agencies for residential customers; and waiving reconnection, service deposits, late fees, interest, and penalties for residential customers. In the Commission's May 26, 2021 Order in Docket No. E,G999/CI-20-375, the Commission adopted a modified Consumer Advocates' Transition Plan and allowed for the resumption of disconnections on August 2, 2021. With the resumption of disconnections, Minnesota Power continued the process of deploying remote-capable meters, timed with reconnection of service, to realize operational efficiency and maximize the potential savings to customers in terms of Company costs as well as direct costs such as future reconnection fees.

Due to the timing of the approval order for this pilot and the COVID-19 protections and Transition Plan that continued into 2022, the timing for implementation of this voluntary three-year pilot program was deferred until resumption of normal operations where residential customer disconnections for non-payment may occur. Once implemented, residential electricity customers had the option to participate. Participating customers whose service has been disconnected for non-payment have the option to have their service reconnected remotely after meeting reconnection requirements. This is contingent on them having a remote-capable meter. These customers can be reconnected within minutes after calling customer service, which eliminates the need for Minnesota Power to send staff to the customer's location to reconnect service in person.

The remote reconnection is accomplished through Advanced Metering Infrastructure (AMI) equipped with remote technology. Participating residential customers will have remote-capable meters over the duration of the pilot and become eligible. For any customer interested in pilot participation who does not have a remote-capable meter, the Company will provide the necessary meter upgrade at no additional charge, upon request by the customer and contingent on meter stock availability.

Under normal operating conditions, Minnesota Power charges customers a \$20 fee for in-person service reconnection during business hours or a \$100 fee outside of business

hours. For any customer that opts for remote reconnection through the pilot, the Company is waiving the reconnection fee, whether during or outside of business hours. Remote reconnection generally enables faster reconnection of service, assuming customer action to get reconnected, and provides potential cost savings and safety benefits by reducing the need to send trucks and staff to customer locations.

The pilot is being offered on a voluntary basis to any residential customer whose service has been disconnected for non-payment. Minnesota Power will also prioritize customers and locations with frequent disconnections, difficult access, location hazards, or unsafe conditions, because remote reconnection offers greater opportunities for cost savings and safety benefits in such locations.

As part of the Order approving the Reconnect Pilot Program, Minnesota Power agreed to report the following information in the annual SRSQ:

1. The number of customers participating in the remote-reconnect program.
2. Total number of customers under the low-income home energy assistance program (“LIHEAP”).
3. The number of remote-reconnect participants with LIHEAP.
4. The number of customers who have opted out of the remote-reconnect program.
5. The estimated annual cost savings from the remote-reconnect program.
6. The average time to reconnect using the remote-reconnect program compared to the standard reconnection process.
7. The number of reconnections restored within 24 hours of disconnection, distinguishing between standard and remote reconnections.

As of December 31, 2022, there were 4,437 participants in the Remote Reconnect Pilot. This is based on the number of residential customers with remote-capable meters. Figure 22 below shows the total number of LIHEAP customers in 2022.

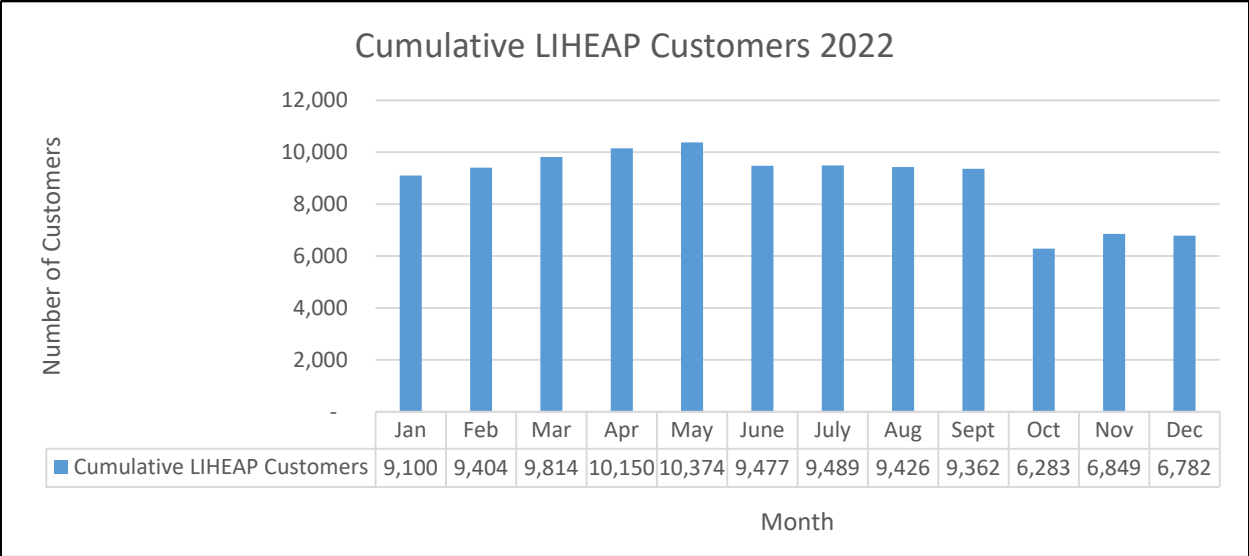


Figure 20: Cumulative LIHEAP Customers 2022

There were 823 LIHEAP customers in the Remote Reconnect Pilot. Nine customers opted out of having an AMI meter at their home in 2022, and would therefore have opted out of the Pilot. This brings the cumulative total to twenty-four. Based on the somewhat limited activity in 2022, Minnesota Power estimates the representative net cost changes specifically related to the Remote Reconnect Pilot to be approximately \$48,000, which is an expenditure increase based on the incremental installed cost of the remote-capable meters. Calendar year 2022 had more collections-related field activity to offset the remote-capable installation costs, as compared to 2021. The Company anticipates figures related to year three (2023) of the Pilot will be more informative, as this will be the first year where COVID-19-related protections and the Commission-approved Transition Plan actions will not have been in place.

The average length of disconnection in days under the Pilot was just over nine days as compared to the standard collection process where it was just under ten days. As disconnection duration is heavily influenced by customer action, Minnesota Power recalculated these averages for customers who had a disconnection duration of ten days or less to remove large anomalies. Under this revised calculation, the average number of days under the Pilot was 0.81, as compared to the average number of days through the standard collection process of 0.89 days. For disconnection duration of 30 days or

less, the average duration for the Pilot was 1.81 and standard collection process was 1.77 days. This indicates that, as the duration of disconnection grows, the impact of the Pilot and related technology on duration is lessened, further underscoring that customer action is an important impact consideration.

Figure 21 shows the number of reconnections restored within 24 hours of disconnection, distinguishing between standard and remote reconnections.

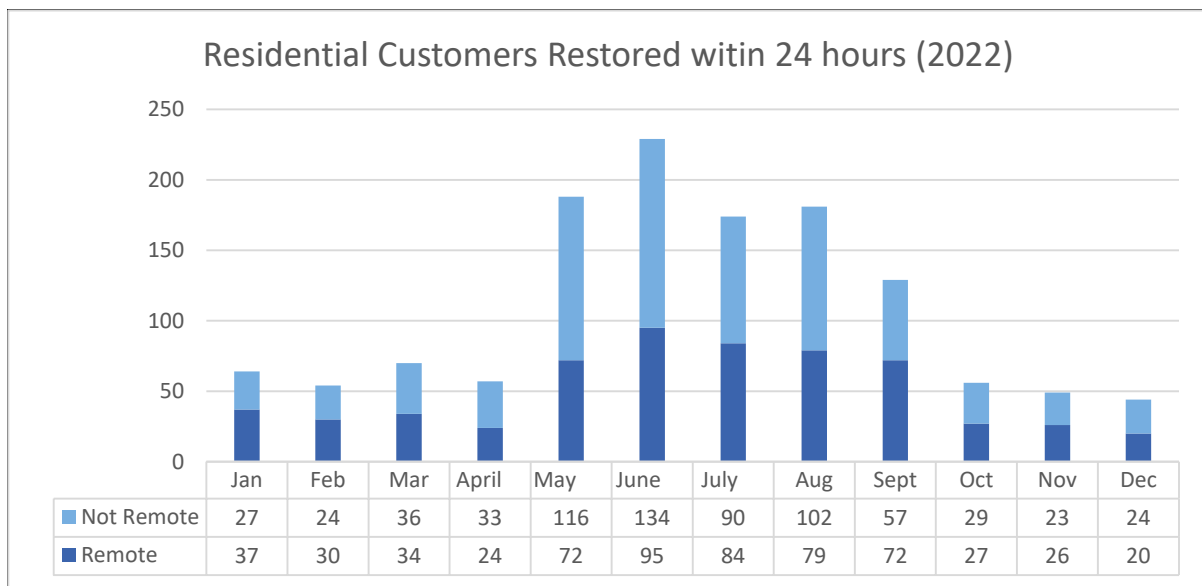


Figure 21: Residential Customers Restored w/in 24 Hours

C. Service Extension Request Response Times: Minnesota Rule 7826.1600

- 1. The number of customers requesting service to a location not previously served by Minnesota Power and the intervals between the date service was installed and the later of the in-service date requested by the customer or the date the premises were ready for service.**

The following charts demonstrate, by customer class, the number of customers requesting service in 2022 to a location not previously served by Minnesota Power.

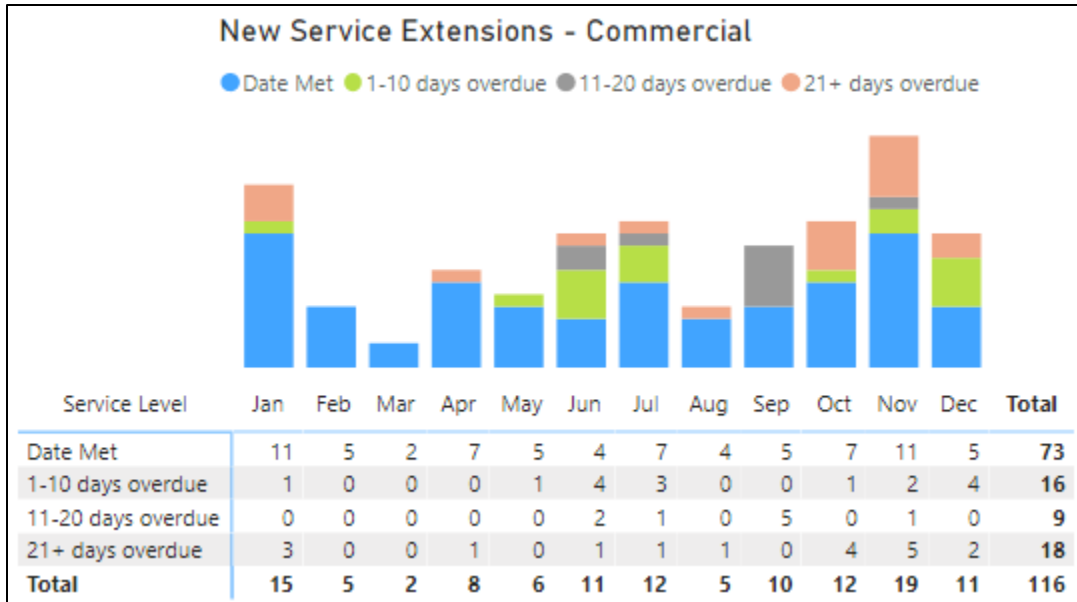


Figure 22: New Service Extensions - Commercial 2022

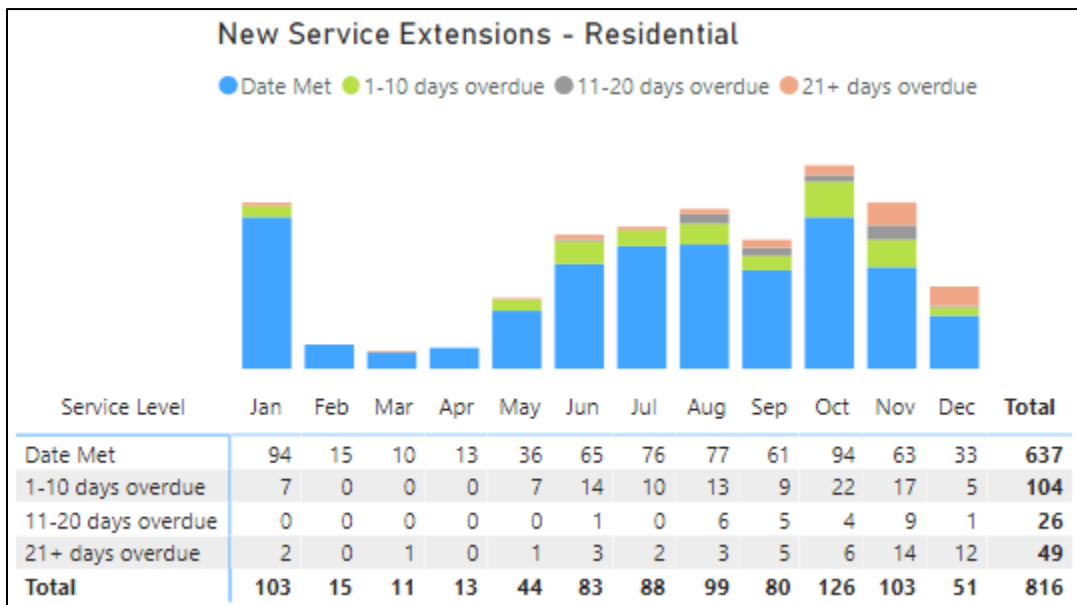


Figure 23: New Service Extensions - Residential 2022

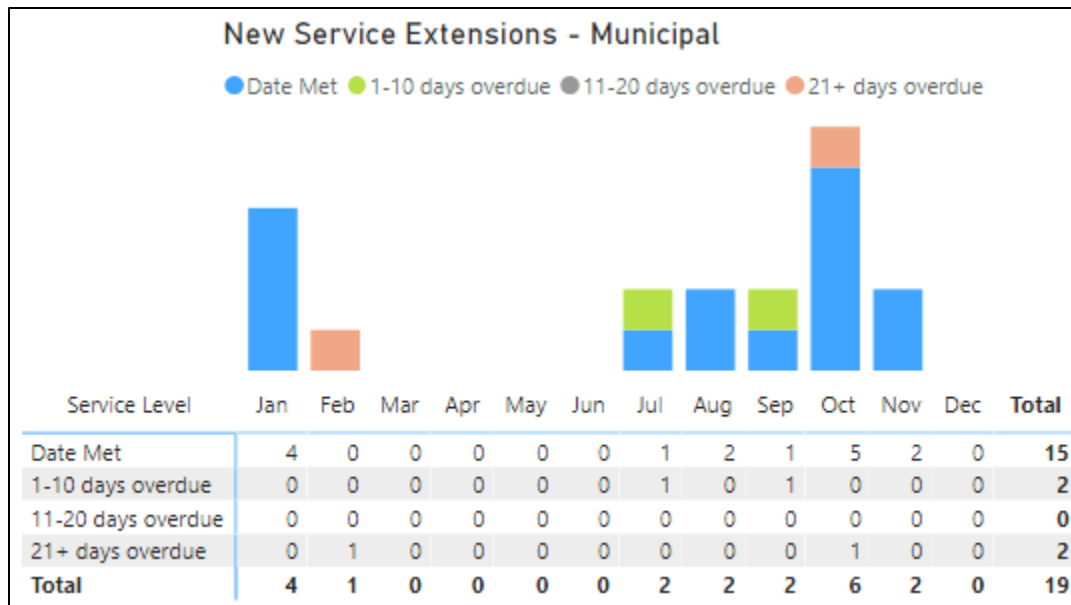


Figure 24: New Service Extensions - Municipal 2022

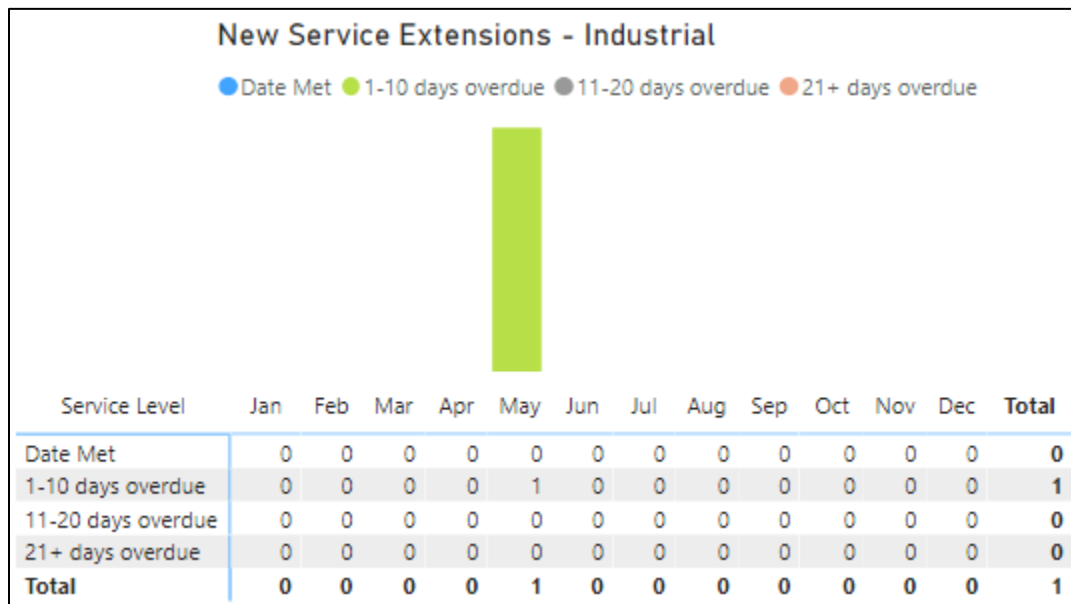


Figure 25: New Service Extensions - Industrial 2022

Figure 26 below lists the number and percentage of locations not previously served by Minnesota Power where the service was installed later than the in-service date requested by the customer, or the date the premises were ready for service and the reason for the delay.

The customer request date was met for 725 of 952 customer requests (76 percent). Of the dates not met, the three largest reasons for a delay in meeting in-service date were: Minnesota Power unable to meet Date (8.40 percent), Customer Not Ready (7.88 percent), and Weather (2.63 percent).

Overall, the major challenges Minnesota Power faced included supply chain issues due to material shortages, mainly in the form of transformers and meter pedestals. This caused a shift in service delays. As depicted below, the “Minnesota Power unable to meet date” was the most prevailing reason for not meeting the new construction customer requested date. This reason can include workforce shortages, scheduling changes, and material shortages. The reason code “material shortage” was not applied consistently and Minnesota Power will follow-up with employee training to accurately represent which delays were related to material shortages rather than shortages in the workforce, which also caused unexpected delays.

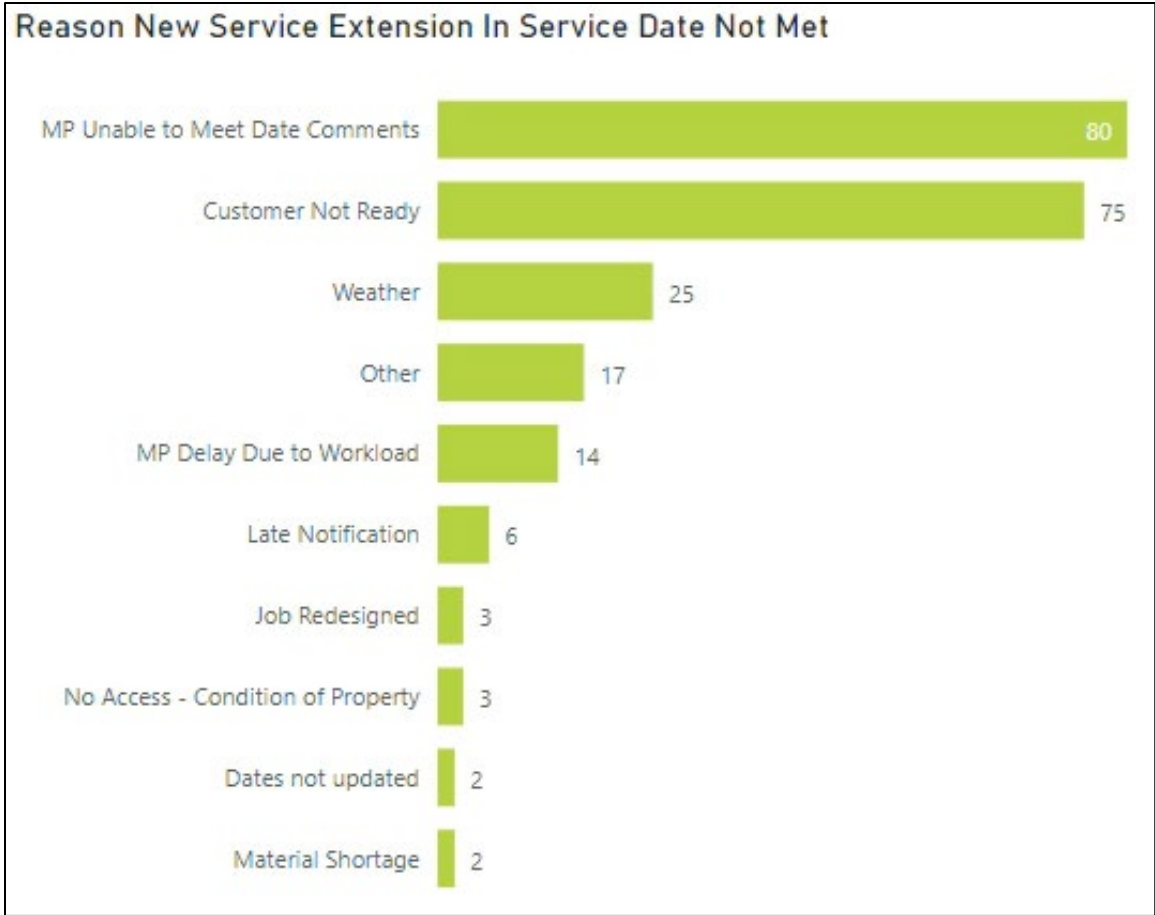


Figure 26: New Service Extensions - Reasons Dates Not Met 2022

- 2. The number of customers requesting service to a location previously served by Minnesota Power, but not served at the time of the request, and the intervals between the date service was installed and the later of the in-service date requested by the customer or the date the premises were ready for service.**

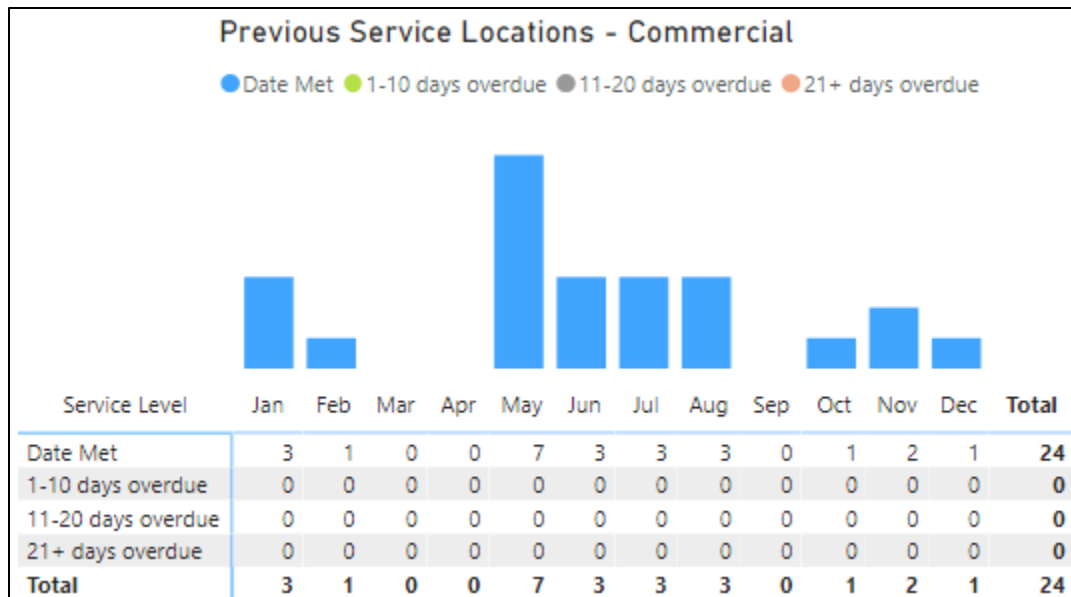


Figure 27: Previous Locations - Commercial 2022

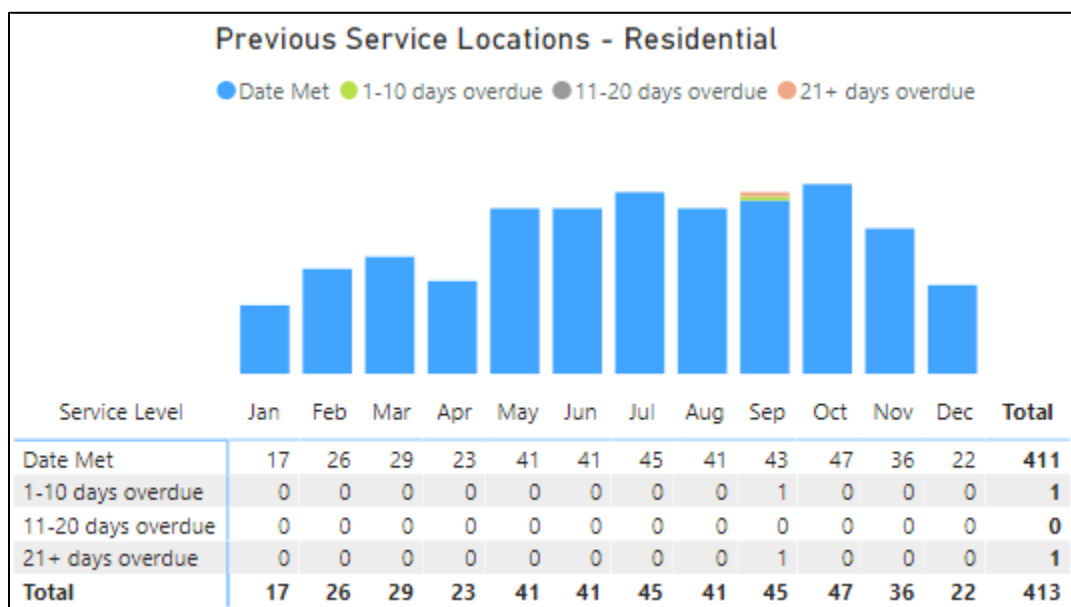


Figure 28: Previous Service Locations - Residential 2022

There were no industrial or municipal customers requesting service to a location previously served by Minnesota Power.

Figure 29 lists the number of locations previously served by Minnesota Power where the service was installed later than the in-service date requested by the customer or the date the premises were ready for service and the reason for the delay.

The largest reason for a delay in meeting in-service date for previous service locations in 2022 was Dates Met. This occurred when customers requested service on a Friday and Minnesota Power installed the meter on Monday.

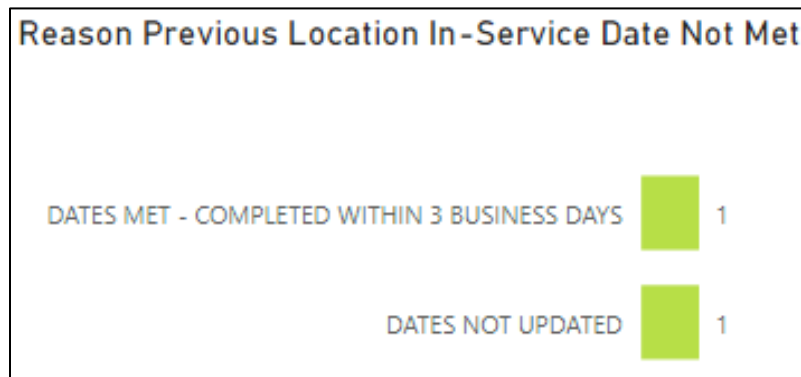


Figure 29: Previous Service Locations - Reasons Date Not Met 2022

D. Reporting Call Center Response Times: Minnesota Rules 7826.1200 & 7826.1700

7826.1200:

Subpart 1. Calls to business office. On an annual basis, utilities shall answer 80 percent of calls made to the business office during regular business hours within 20 seconds. "Answer" means that an operator or representative is ready to render assistance or accept the information to handle the call. Acknowledging that the customer is waiting on the line and will be served in turn is not an answer. If the utility uses an automated call-processing system, the 20-second period begins when the customer has selected a menu option to speak to a live operator or representative. Utilities using automatic call-processing

systems must provide that option, and they must not delay connecting the caller to a live operator or representative for purposes of playing promotional announcements.

Subp. 2. Calls regarding service interruptions. On an annual basis, utilities shall answer 80 percent of calls directed to the telephone number for reporting service interruptions within 20 seconds. "Answer" may mean connecting the caller to a recording providing, to the extent practicable, at least the following information:

- A. the number of customers affected by the interruption*
- B. the cause of the interruption*
- C. the location of the interruption; and*
- D. the utility's best estimate of when service will be restored, by geographical area.*

7826.1700:

The annual service quality report must include a detailed report on call center response times, including calls to the business office and calls regarding service interruptions. The report must include a month-by-month breakdown of this information.

Generally, calls to Minnesota Power – whether they relate to service interruption, line extension, billing inquiries or any other subject matter – are routed through the Company’s Interactive Voice Response (“IVR”) unit. Customers have a menu of options within the IVR to choose from in order to address the subject of their call. The first option is to report an outage by entering a trouble order; and there is an option to speak directly to a Call Center representative.

Calls routed to outage reporting are handled immediately through the automated trouble-order system; calls that are directed to the Call Center are manually entered into the trouble-order system by the Call Center representative.

Consistent with prior SRSQ reporting, Minnesota Power defines business hours as 7:00 am to 5:30 pm, Monday through Friday, excluding holidays. Minnesota Power’s response time calculation methodology includes all calls offered during normal business hours. In

2022, Minnesota Power answered 45 percent of calls offered during business hours within 20 seconds, significantly below the annual goal of 80 percent defined in Minn. Rule 7826.1200. Minnesota Power only met the 80 percent goal threshold 1 out of 12 months of the year. However, Minnesota Power is currently showing an encouraging upward trend for 2023. The response time in January 2023 reflected a 78 percent response rate, while February reflected an 88 percent response rate. As of mid-March 2023, the overall response rate for 2023 was 82 percent.

Specific to 2022, Minnesota Power adapted to numerous changes, challenges, and opportunities that impacted call response times, namely continued COVID-19 impacts, residential rate transition, attrition in the Call Center, and unplanned absences. As the COVID-19 pandemic restrictions were decreased, Minnesota Power transitioned nearly all Customer Care and Support Representatives (“CCSRs”) from a remote work environment back to the office location. This transition was completed in January of 2022 and was an important part of the Company’s efforts to improve response time through increased collaboration, real-time coaching, and peer-to-peer learning. While the Company has seen benefits from returning the Call Center to the office, absenteeism continues to be a challenge, particularly with quarantine protocol for symptomatic employees and/or their families. In 2022, over 75 percent of Call Center employees were absent at least once due to COVID-related illness or COVID-like symptoms for themselves or their families, oftentimes with multi-day absences.

There was also an increase in call volume during the first half of the year, largely related to the COVID-19 pandemic customer protections coming to an end and outreach efforts for energy assistance. Minnesota Power continued to offer extended payment plans and refer customers to assistance programs when available, to assist with payment of high balances that were accrued during the protection period. The complexity of these calls resulted in average handle times remaining elevated. Importantly, during this timeframe, utilities across Minnesota had advanced approved transition plans to resume normal procedures for customer nonpayment following the temporary suspension of

disconnections and late fees during the COVID-19 pandemic.¹³ These transition plans ended on April 30, 2022,¹⁴ with the exception of a voluntary extension of Low Income Home Energy Assistance Program (“EAP” or “LIHEAP”) disconnection protections to May 31, 2022, as requested by the Department of Commerce and informally honored by Minnesota Power and several other utilities. With an application period deadline of May 31, 2022 for LIHEAP, outreach efforts – particularly regarding potential energy assistance – necessarily focused on those with arrears balances and/or to raise general awareness about the availability of energy assistance dollars. Customers who had not maximized the available crisis funding through energy assistance were encouraged to make additional funding requests by or before July 1, 2022. Throughout this timeframe, the Company encouraged payment plans for customers who had accrued balances.

This increased call volume and call duration for the Call Center, as collections, assistance, and payment plan calls are among the most complex to navigate with customers. This is strongly evidenced with the exceptionally high call volume in May. In the later summer months, the Company worked with the Department of Commerce regarding an arrears pay down for LIHEAP customers that was ultimately paid directly to customer accounts in early September, and shortly followed by a supplemental primary heat benefit for eligible customers. In the midst of this, Customer Affordability of Residential Electricity (“CARE”) affordability discount renewal applications and next-year LIHEAP application mailings were occurring. Further, Cold Weather Rule inserts were provided with September bills as part of those statutory notification requirements, prompting calls for those protections.

To help offset the pressure on response times, in September 2022, the Company shortened the default call wrap time for representatives to document calls from three minutes to two minutes. This was in recognition of increased call volume and meant to encourage representatives to get back into call queue as quickly as possible.

¹³ *In the Matter of an Inquiry into Actions by Electric and Natural Gas Utilities in Light of the COVID-19 Pandemic Emergency*, Docket No. E,G-999/CI-20-375, ORDER ADOPTING BROAD TRANSITION PLAN PROPOSAL, SUSPENDING NEGATIVE REPORTING, AND ESTABLISHING NOTICE AND COMMUNICATION REQUIREMENTS (May 26, 2021).

¹⁴ *Ibid* at 9, Order Point 1.b.

Recognizing some calls are more complex than others, representatives have the discretion to end their wrap time sooner or, if needed, to go into an extended call wrap to ensure contacts and documentation are appropriately updated. In December 2022, as another measure to help with call response time, Minnesota Power offered a dedicated phone line for agencies that process energy assistance applications, with an assigned direct point of contact. This was with the intention to ensure the Call Center is able to prioritize direct customer calls in the general call queue, while also ensuring timely response to agencies as they assist customers with LIHEAP resources. Both agencies and customers also continue to have the option to email Minnesota Power at CustomerService@mnpower.com.

Additionally, during 2022, Phase 2 of the Company's residential rate transition occurred. This included the deployment of a first-in-the-state self-declaration process for residential customers to continue to receive an income- and usage-qualified discount. In September 2022, Minnesota Power sent letters to nearly 70,000 residential customers who were receiving the usage-qualified discount in Phase 1 to notify them of the change in eligibility and revised rates that would be effective in October as part of Phase 2.

While the mailing was anticipated to be staggered starting in late August through mid-September to help with call volume, supply chain issues with paper and envelopes led to unanticipated delays and the mailing was sent in bulk. The letters indicated that action was required to keep the discount, included the amount that the discount had saved each customer to date to provide actual bill impact context in dollars, and described the low-income self-declaration criteria. The mailing included the application form to determine income eligibility and a postage-paid envelope. Customers could apply online, over the phone, by mail, by email, or by fax. A dedicated email box and phone extension were established to help manage applications and questions from customers through a devoted resource. This was intended to help alleviate call response strains. Even with this dedicated channel, response times remained challenged during the second half of the year, in part due to the overwhelming customer response to the self-declaration mailing. As this was a new offering requiring action, many customers made contact with the Call Center to determine if they were eligible to participate.

Further, a CARE program modification was simultaneously launched for eligible self-declared customers to be enrolled in CARE discounts. Given the multitude of outreach activities and time-sensitivity related to these activities, Minnesota Power routinely checked in with the Commission's Consumer Affairs Office regarding call pressure and the need to carefully consider timing for other outreach.

In Order Point 9 of the Commission's November 9, 2022 Order, the Commission asks the Company to "describe in its 2023 filing its efforts to recruit, hire and train new call center representatives if data for service in 2022 show that the Company has not answered 80 percent of calls either made to the business office during regular business hours or for service interruption within 20 seconds." As important context, Minnesota Power's Call Center staffing goal is informed by call volume and duration, both of which were trending downward prior to the COVID-19 pandemic. The current staffing target is approximately 20 representatives, with a roughly 80 percent full time and 20 percent part time mix to provide flexibility to meet call response demands. Throughout 2022, Minnesota Power had Call Center staff consisting of between fifteen and eighteen CCSRs.

Over the course of the year, Minnesota Power continued to struggle with lean staffing in the Call Center, particularly in the beginning of 2022, due to a combination of attrition and unplanned absences. During 2022, roughly one-third of the Call Center left their roles, primarily for internal job opportunities within the Company but outside of the Call Center. This is "good attrition" in the sense that the Company is retaining this talent and the Call Center has long-been an excellent entry point for a career at Minnesota Power. However, it does create call response strain until new employees are recruited, hired, and trained. As a result, the Company hired and trained a total of eight new Customer Care and Support Representatives.

Further exacerbating the staffing challenge in 2022 was an unprecedented low response rate to job postings for the Call Center. In June 2022, Minnesota saw the lowest unemployment rate in the country – and the lowest in the state's history - at just 1.8

percent.¹⁵ While Minnesota Power is not immune to workforce shortages that comes with record-setting state unemployment rates, the Company deployed multiple tactics to help with recruiting, including staggered postings, inclusion of the rate of pay, and increased outreach to raise awareness about postings. Through peer benchmarking, the Company confirmed it offers a very competitive wage for the Call Center role. In late 2022, Minnesota Power had an exciting opportunity through its Human Resources department to partner with a local university to review and develop interview guides for Call Center job postings. This process was undertaken with the goal of streamlining the recruitment and selection process, thereby striving to shorten the period from posting to hire. It included a thorough review of competencies to help ensure the interview process would be more successful in identifying candidates well-suited to the responsibilities of the position. Minnesota Power was able to use the updated process for job postings in early 2023 and is optimistic about the impacts of this effort. The Company is pleased to report that, as of the date of this filing, Minnesota Power's Call Center is fully staffed at 21 CCSRs, four of which are nearly through their training and expected to be in the call queue by early April 2023.

The onboarding and training of new CCSRs is a complex and time-intensive process that can take up to six weeks. It includes drawing upon other CCSRs to serve as mentors. In 2022, the first wave of new Customer Care and Support Representatives were hired and trained over the course of about six weeks. By May 11, 2022, four CCSRs were fully on-boarded and assisting with call volume. The second wave of new CCSRs was also hired and trained over the course of about six weeks. These CCSRs were fully on-boarded and assisting with call volume by September 8, 2022. While helpful to have more representatives on the phones, they are not considered fully proficient until they have been in the role six months. Even then, there are seasonal aspects to the role that representatives must learn over time. As such, handle times for new representatives tend to be longer and the handle times of more seasoned representatives are also extended as they assist and mentor new peers.

¹⁵ <https://www.mprnews.org/story/2022/07/21/minnesota-celebrates-confronts-bafflingly-low-unemployment-rate>

As the first group of new employees became more proficient in their call handling abilities, and the second wave was integrated into the call queue to better distribute call volume, Minnesota Power observed an upward trend in the response time towards the end of the year. As referenced earlier, this upward trend has continued and 2023 is off to a promising start.

In addition to the call response statistics typically reported, the Company provides further information in Table 41 about call statistics. This table is also provided in Appendix C to this filing in spreadsheet format. This is in response to the Commission's November 9, 2022 Order, Order Point 10, which states:

Require Minnesota Power to make a compliance filing, within 30 days of the issuance of this order in Docket No. E-0015/M-22-163 and in next years' service quality docket, which reports monthly average answer time and call duration for all calls offered to agents, Customer Care and Support Representatives or otherwise, in the Company's Call Center during business hours. Minnesota Power shall provide the data in spreadsheet (.xlsx) format and to the greatest extent practicable. Where the Company is not able to do so, it shall explain why.

Average answer time is also referred to as average speed of answer. Call duration is also referred to as average talk time. In addition to the two metrics specified in Order Point 10, Minnesota Power also provides average handle time. This is a more comprehensive metric for the call interaction that includes not only average talk time, but also average hold time and average after call work, such as data entry and call documentation.

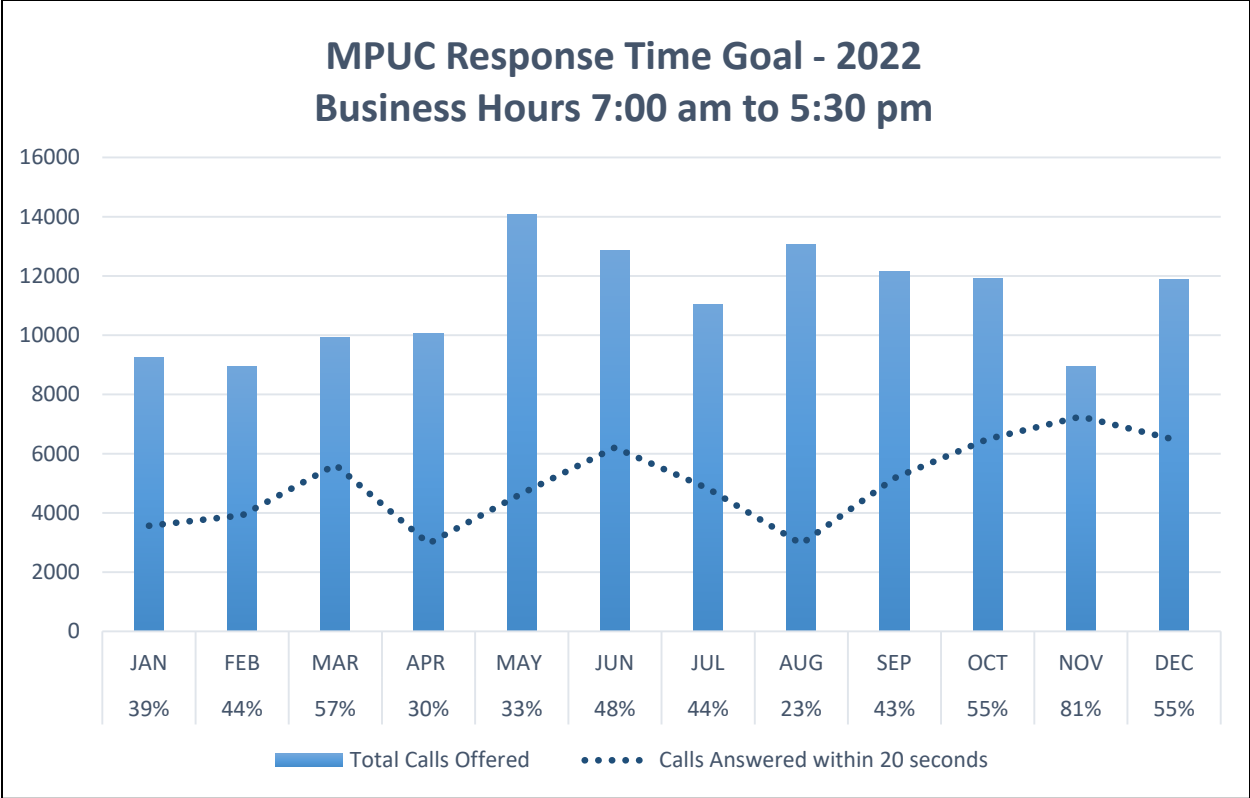


Figure 30: Response Time – Business Hours 2022

Table 41: Response Time - Business Hours 2022

Business Hours, 7 AM - 5:30 PM, Monday - Friday						
Month 2022	Response Time	Total Calls Offered	Calls Answered within 20 seconds	Average Speed of Answer (Answer Time)	Average Talk Time (Call Duration)	Average Handle Time
Jan	39%	9,251	3,567	0:02:08	0:04:29	0:06:48
Feb	44%	8,947	3,919	0:01:44	0:04:24	0:06:45
Mar	57%	9,915	5,624	0:01:06	0:04:03	0:06:32
Apr	30%	10,052	2,969	0:02:40	0:04:06	0:06:31
May	33%	14,064	4,654	0:02:38	0:03:52	0:06:03
Jun	48%	12,853	6,208	0:01:22	0:04:03	0:06:25
Jul	44%	11,026	4,822	0:01:36	0:04:13	0:06:40
Aug	23%	13,052	2,955	0:04:08	0:04:39	0:06:57
Sep	43%	12,145	5,177	0:02:47	0:04:24	0:06:31
Oct	55%	11,903	6,496	0:01:50	0:04:25	0:06:05
Nov	81%	8,945	7,253	0:00:25	0:04:14	0:05:58
Dec	55%	11,882	6,477	0:01:38	0:04:05	0:05:41
YTD	45%	134,035	60,121	0:02:00	0:04:15	0:06:25

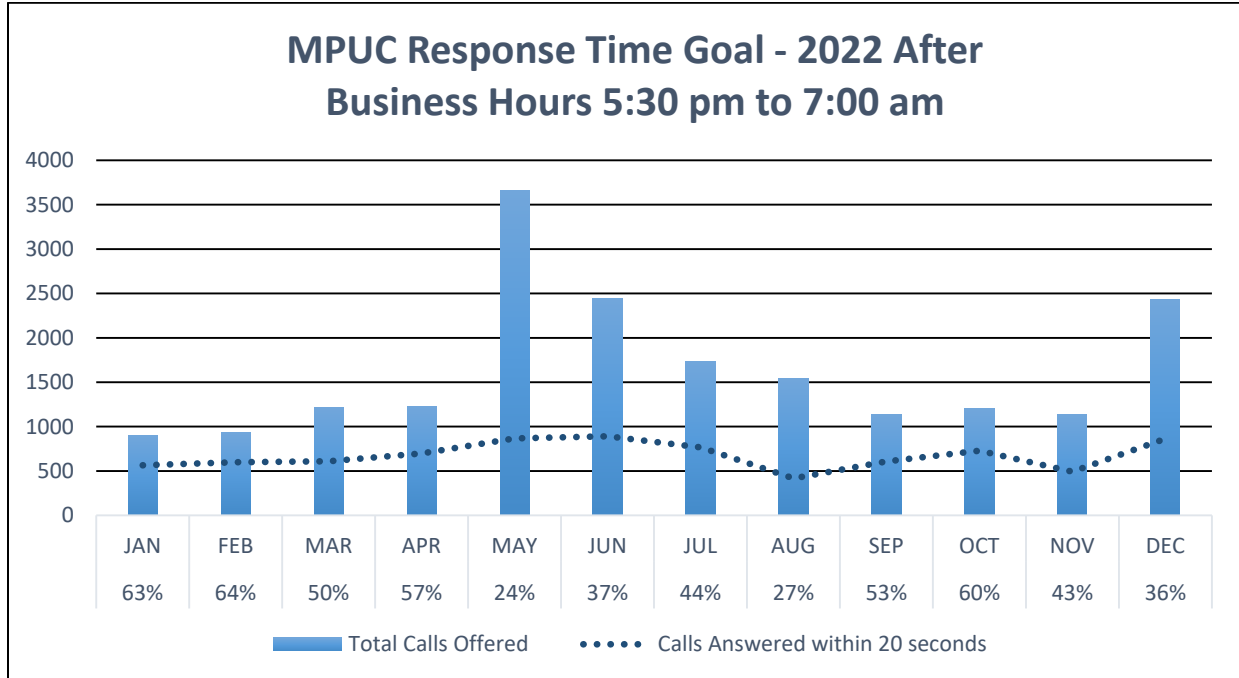


Figure 31: Response Time – After Hours 2022

Table 42: Response Time - After Hours 2022

After Hours 5:30 p.m. - 7:00 a.m.			
Month 2022	Response Time	Total Calls Offered	Calls Answered within 20 seconds
Jan	63%	901	564
Feb	64%	932	599
Mar	50%	1,220	610
Apr	57%	1,229	698
May	24%	3,663	868
Jun	37%	2,440	891
Jul	44%	1,735	767
Aug	27%	1,542	417
Sep	53%	1,139	608
Oct	60%	1,205	728
Nov	43%	1,134	493
Dec	36%	2,432	864
YTD	41%	19,572	8,107

Figure 32 provides a breakdown of calls received in 2022 by subject matter category. This breakdown is based on the wrap codes that are used by representatives when closing and documenting a call. Calls may cover a range of topics, so the primary subject matter is determined subjectively by each representative. Please note that the total number of calls and the number of wrap codes do not reconcile, as multiple representatives may handle a single call and each would choose a wrap code according to their role in addressing the customer inquiry. The Phone Transfer and Not Specified categories generally relate to calls where a representative with primarily operator responsibilities transferred the call or the caller requested to be transferred.

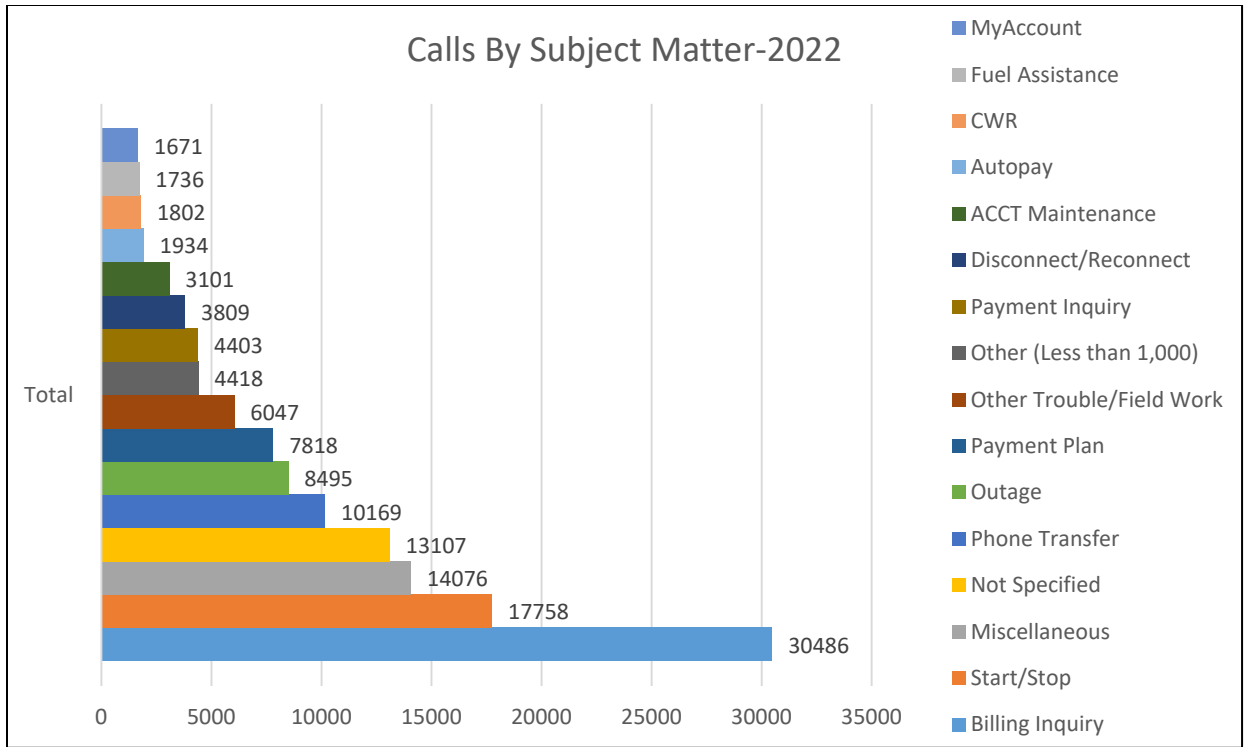


Figure 32: Calls by Subject Matter - 2022

E. Reporting Emergency Medical Account: Minnesota Rule 7826.1800

The annual service quality report must include the number of customers who requested emergency medical account status under Minn. Stat. §216B.098, subd. 5, the number whose applications were granted, and the number whose applications were denied, and the reasons for each denial.

Table 43: Emergency Medical Account Status Count 2022

DATE	Requested	Renewed	Added	Denied
Jan	6	6	0	0
Feb	5	2	3	0
Mar	12	9	3	0
Apr	4	1	3	0
May	7	3	4	0
Jun	8	3	5	0
Jul	12	7	5	0
Aug	5	1	4	0
Sep	5	1	4	0
Oct	8	2	6	0
Nov	10	6	4	0
Dec	20	4	16	0
Totals:	102	45	57	0

In 2022, Minnesota Power had 102 customers request emergency medical account status. 102 requests were granted after customers provided Minnesota Power with the required signed physician documentation indicating need. In total with the above referenced requests and renewals, there were 246 customers noted in the system with medical account status designation. A total of 77 were removed due to non-renewal, customer request, deceased customer, or closed account. All documentation is on file and available upon request. Due to the COVID transition plan and customers still facing challenges getting updated documentation from medical professionals, there were no customers removed due to non-renewal prior to August of 2022.

When customers contact Minnesota Power indicating they have medical/life sustaining equipment, they are advised that to be eligible to participate in the program they should have their physician or medical supply company send the Company a signed letter

identifying there is a medically necessary need and the duration prescribed. The letter is to be mailed or faxed to Minnesota Power's office (mailing/faxing information listed on mnpower.com). When the signed form is received, it is directed to a Customer Care and Support Representative ("CCSR") who updates the account with emergency medical account status and the form is then filed. This certification must be renewed annually. Approximately 30 days prior to a certificate expiring, a CCSR sends a letter to the customer. If Minnesota Power does not receive a response, the Company attempts to reach the customer via phone. If a new letter is received, the account is updated for another year. If not, the medical account status is removed from the account.

F. Reporting Customer Deposits: Minnesota Rule 7826.1900

The annual service quality report must include the number of customers who were required to make a deposit as a condition of receiving service.

Minnesota Power refunded all deposits in 2014. Collection of deposits may be reconsidered in the future.

G. Reporting Customer Complaints: Minnesota Rule 7826.2000 and 7820.0500

In its January 18, 2023 order in Docket Number E015/M-22-163, the Commission ordered that all Utilities be required to include customer complaint data from Minnesota Rules 7820.0500 in their Annual Service Quality reports with data filed as part of Minnesota Rules 7826.2000. This requirement was put in place to eliminate the standalone Annual Summary of Customer Complaints docket (YY-13).

Minnesota Power was and remains supportive of opportunities to streamline regulatory reporting in general, and agreed to file all the complaints information in one section of the SRSQ and footnote the applicable Rule the data applies to. While much of the data required under Minnesota Rules 7820.0500 and 7826.2000 is the same, the Company footnotes data added specifically to comply with inclusion of requirements under Minn. Rule 7820.0500.

The annual service quality report must include a detailed report on complaints by customer class and calendar month, including at least the following information:

[Any complaints for customer classes other than Commercial and Residential are handled individually and, as such, not recorded in Minnesota Power's Customer Information System.]

1. The number of complaints received.

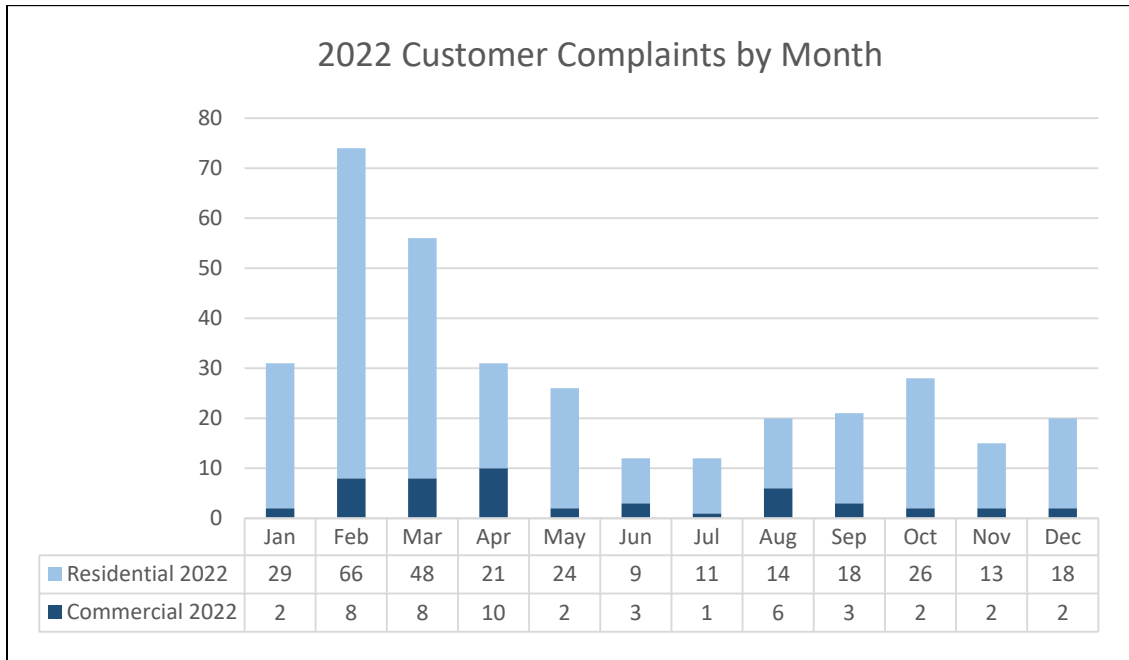


Figure 33: Customer Complaints by Month 2022

Table 44: Customer Complaints Totals

Customer Class	Total	% of Total
Residential	297	85.84%
Commercial	49	14.16%
Total	346	100.00%

2. The number and percentage of complaints alleging billing errors, inaccurate metering, wrongful disconnection, high bills, inadequate service, and the number involving service extension intervals, service restoration intervals, and any other identifiable subject matter involved in five percent or more of customer complaints.

Table 45: Residential and Commercial Complaints by Type 2022

Complaint Description	Customer Class	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total	% of Total
Billing Error	Commercial	0	3	1	3	1	0	0	1	0	0	0	0	9	2.60%
Billing Error	Residential	0	6	1	2	0	0	0	1	0	1	0	0	11	3.18%
High Bill Complaint	Commercial	2	5	7	6	1	3	1	2	2	2	2	2	35	10.12%
High Bill Complaint	Residential	24	56	45	16	19	5	7	13	16	21	12	15	249	71.97%
Inadequate Service	Commercial	0	0	0	1	0	0	0	0	1	0	0	0	2	0.58%
Inadequate Service	Residential	2	0	1	1	1	1	2	0	1	2	0	3	14	4.05%
Incorrect Metering	Commercial	0	0	0	0	0	0	0	1	0	0	0	0	1	0.29%
Incorrect Metering	Residential	3	4	1	2	4	1	1	0	0	2	0	0	18	5.20%
Service Restoration	Residential	0	0	0	0	0	2	1	0	0	0	1	0	4	1.16%
Wrongful Disconnection	Commercial	0	0	0	0	0	0	0	2	0	0	0	0	2	0.58%
Wrongful Disconnection	Residential	0	0	0	0	0	0	0	0	1	0	0	0	1	0.29%
Total		31	74	56	31	26	12	12	20	21	28	15	20	346	100%

3. The number and percentage of complaints resolved upon initial inquiry, within ten days, and longer than ten days.

Table 46: Timeframe of Complaints Resolved 2022

Days To Resolution	Customer Group	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total	% of Total
Greater Than 10 Days	Commercial	2	3	0	3	1	0	0	3	1	1	0	1	15	30.92%
Greater Than 10 Days	Residential	14	14	10	8	12	5	5	3	2	9	4	6	92	
Less Than 10 Days	Commercial	0	3	7	7	1	1	1	1	2	1	1	1	26	55.20%
Less Than 10 Days	Residential	9	44	35	12	10	4	6	9	12	9	7	8	165	
Same Day Resolution	Commercial	0	2	1	0	0	2	0	2	0	0	1	0	8	13.87%
Same Day Resolution	Residential	6	8	3	1	2	0	0	2	4	8	2	4	40	
Total		31	74	56	31	26	12	12	20	21	28	15	20	346	100%

- 4. The number and percentage of all complaints resolved by taking any of the following actions: (1) taking the action the customer requested; (2) taking an action the customer and the utility agree is an acceptable compromise, (3) providing the customer with information that demonstrates that the situation complained of is not reasonably within the control of the utility; or (4) refusing to take the action the customer requested.**

Table 47: Residential Complaints Resolved 2022

Resolution Reason	Commercial	Residential	Total	% Resolved Contacts
Compromise	9	61	70	20.23%
Customer Request	16	38	54	15.61%
No Control	24	197	221	63.87%
Refuse	0	1	1	0.29%
Total	49	297	346	100.00%

- 5. The number of complaints forwarded to the utility by the Commission’s Consumer Affairs Office for further investigation and action.**

Minnesota Power had 32 complaints forwarded to the utility by the Commission’s Consumers Affairs Office for further investigation and action in 2022.

Items 6 through 8 have been added to include reporting elements that have been included under Minn. Rule 7820.0500.¹⁶

¹⁶ Customer complaint data as required under Minnesota Rule 7820.0500.

6. The number of complaints by type and customer class.

The categories below are merged into different complaint type categories, consistent with reporting that has been conducted under Minn. Rule 7820.0500. Service includes Inadequate Service, Incorrect Metering, Service Restoration, and Wrongful Disconnection. Billing includes Billing Error and High Bill Complaint. Rate has no data, as Minnesota Power does not have a Rates complaint category. Rules is MPUC complaints forwarded to the Company, consistent with item 5 above.

Table 48: Complaints by Type and Customer Class

Complaint Type	Residential			Commercial/Industrial			Interruptible		
	Received	Resolved	Unresolved	Received	Resolved	Unresolved	Received	Resolved	Unresolved
Service	37	37	0	5	5	0	0	0	0
Billing	260	260	0	44	44	0	0	0	0
Rate	0	0	0	0	0	0	0	0	0
Rules	28	28	0	4	4	0	0	0	0

7. Number of disconnections for non-payment by customer class.

Table 49: Number of disconnections for non-payment by customer class

	Residential	Commercial	Interruptible
Disconnections for Non-Payment	2027	103	0
Escrow Forms Filed	0	0	0

Table 50: Number of Disconnections for Non-Payment by Customer Class by Month

Month	Residential	Commercial/Industrial	Interruptible
Jan	96	5	0
Feb	80	4	0
Mar	127	10	0
Apr	102	4	0
May	273	20	0
Jun	370	12	0
Jul	282	11	0
Aug	281	16	0
Sep	202	11	0
Oct	88	3	0
Nov	70	5	0
Dec	56	2	0
Total	2027	103	0

8. Annual total number of customers by customer class and customers added in the current year.

Table 51: Total Number of Customers and Customers Add by Customer Class for 2022

	Residential	Commercial	Interruptible
Number of Customers (year-end)	108,432	16,208	0
Customers Added During Year	286	14	0

H. Customer Complaint Categories

Regarding Order Point 16 of the 2020 SRSQ Order, Commission Staff, including the Consumer Affairs Office, convened a work group meeting on Monday, March, 1, 2021, with the Department of Commerce, Xcel Energy, Minnesota Power, and Otter Tail Power to review and discuss current complaint categories used in annual SRSQ reports. Minnesota Rule 7826.2000 was reviewed along with the current categories used by each of the utilities and the Consumer Affairs Office. The group agreed to work together to further refine definitions for existing categories to allow for greater specificity and seek consistency, where possible. As part of this review, additional categories may be considered based on emerging topics of interest.

Additional work group meetings were held in June 2021, January 2022, and March 2022 to further discuss and compare the complaint reporting for commonalities. In the March 2022 meeting, the utilities each brought further details regarding the practical application

of complaint categories their respective organizations used. These were discussed in detail to find consensus categories and application, where possible, for reporting in annual service quality reports, including category definitions and timing for any changes determined as part of the work group process. Ultimately, parties agreed to additional detail for reporting of the category “Inadequate Service”, as listed in Minnesota Rule 7826.2000. Inadequate Service is a broad topic and separating this category further will assist in the overall depiction of the types of complaints reported. Utilities will break out Inadequate Service into:

- Inadequate Service – Field/Operations
- Inadequate Service – Customer Service
- Inadequate Service – Programs and Services
- Inadequate Service – Cold Weather Rule Protection

Parties in the work group generally agreed that, beginning with the 2023 SRSQ Annual Report, filed in April of 2024, the utilities would report on the customer complaint categories agreed to by consensus. Beginning with those SRSQ reports, the utilities will include a table of the agreed upon complaint categories, definitions of what falls into those categories, and count of complaints by category.

IX. Proposed Reliability Standards

Minnesota Rule 7826.0600, Subp. 1 requires each utility, on or before April 1 of each year to file proposed reliability standards in the form of proposed numerical values for the SAIDI, SAIFI, and CAIDI values for each of its work centers. In an Order dated March 2, 2022 Order in Docket No. E015/M-21-230, the Commission established three Work Centers for Minnesota Power, as described on pages 25-26 of the Company’s 2020 Safety, Reliability and Service Quality Report. Additionally, in this same Order the Commission set the Company’s 2022 statewide Reliability Standard at the IEEE benchmarking 2nd Quartile for medium utilities, and its work center reliability standards at the IEEE benchmarking 2nd quartile for small utilities. In compliance with Minn. Rule 7826.0600, Subp. 1, Minnesota Power proposes following the 2nd quartile numbers from the 2022 IEEE reliability survey, the results of which will be published in the second half of 2023. At that time, Minnesota Power will submit a supplemental filing with the updated goals.

Table 52: 2022 Proposed Reliability Performance Standards (These numbers will be updated to 2023 Proposed Reliability Performance Standards when IEEE numbers become available.)

	Central	Northern	Western	OVERALL
SAIDI	160.20	160.20	160.20	147.65
SAIFI	1.33	1.33	1.33	1.21
CAIDI	107.84	107.84	107.84	127.35

X. Conclusion

Minnesota Power respectfully submits information on its Safety, Reliability and Service Quality metrics. This information provides the Commission and stakeholders transparency into the Company's distribution system and the holistic planning that goes into maintaining the system's robustness and resilience, while remaining responsive to customers and their expectations. Minnesota Power is proud to have provided power that was over 99 percent reliable for its customers in 2022 and reports, by Work Center, on how it performed compared to peer utilities. As described in this report, along with the Company's most recent Integrated Distribution Plan, Minnesota Power has initiated a number of efforts to improve reliability, including strategic undergrounding, grid modernization, and asset renewal programs.

As also described throughout this filing, Minnesota Power continued to adapt its operations as the COVID-19 pandemic evolved, the state's peacetime emergency declaration ended and the Company returned to normal operations, including residential customer collections processes. Throughout 2022, Minnesota Power made several transitions with respect to rate design and program offerings. Simultaneously, the Company experienced similar challenges as others in the industry and across the state – including supply chain disruptions, workforce shortages, and unplanned absences. As such, the Company was challenged in meeting some of the metrics in this report, including call response times. However, the Company's Customer Care and Support Representatives spent necessary time on customer calls, with significant emphasis on discussing payment agreement options and assistance programs as Minnesota utilities returned to normal operations. Many of these efforts were intended to help customers with past due balances that had grown during the pandemic. While great strides were made in reducing these arrears balances, they still remain well-above pre-pandemic levels, having spanned three Cold Weather Rule protection seasons in many cases.

In addition to ensuring reliability of its system and caring for its customers, Minnesota Power is also dedicated to helping communities and fellow utilities as they endure natural disaster-related outages. Minnesota Power has heartily embraced new opportunities as

the Company continues to lead the way on energy and grid transition, while also enduring many of the lingering challenges that arose during the pandemic and swiftly responding to an emergence of atypical storm events. Minnesota Power looks forward to continuing its commitment to Sustainability in Action – driving excellence through the Company’s shared values of Integrity, Safety, People and Planet.

STATE OF MINNESOTA)
) ss
COUNTY OF ST. LOUIS)

AFFIDAVIT OF SERVICE VIA
ELECTRONIC FILING

Tiana Heger of the City of Duluth, County of St. Louis, State of Minnesota, says that on the 3rd day of April, 2023, she served Minnesota Power's 2022 Safety, Reliability and Service Quality Standards Report in **Docket No. E015/M-23-75** on the Minnesota Public Utilities Commission and the Energy Resources Division of the Minnesota Department of Commerce via electronic filing. The persons on E-Docket's Official Service List for this Docket were served as requested.



Tiana Heger