



AN ALLETE COMPANY

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April 1, 2023

**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 2023 Safety,  
Reliability and Service Quality Standards Report  
Docket No. E015/M-24-XX**

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 2023 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](mailto:cvatalaro@allete.com) if you have any questions regarding this filing.

Yours truly,

*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**

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In the Matter of Minnesota Power’s 2023 Safety,  
Reliability and Service Quality Standards  
Report in Accordance with Minn. Rule 7826

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Docket No. E015/M-24-XX  
**2023 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 December 5, 2023 order in the Company’s 2022 SRSQ (Docket No. E15/M-23-75). 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 reliable, safe, and affordable electric service to its unique customer base.

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**STATE OF MINNESOTA  
BEFORE THE  
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Report in Accordance with Minn. Rule 7826

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Docket No. E015/M-24-XX  
**2023 SRSQ REPORT**

**I. Introduction**

Minnesota Power (or the “Company”) respectfully submits its eighteenth 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 December 5, 2023 orders in the Company’s 2022 SRSQ (Docket No. E15/M-23-75). 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 reliable, safe, and affordable electric service to its unique customer base.

Throughout 2023, the Company performed strongly in many areas including reliability benchmarking, safety, storm response, and system resilience, even as it continued to encounter supply chain challenges, inflation, and labor shortages. Minnesota Power is proud to have provided over 99.9 percent reliable power for its customers in 2023 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 several efforts to improve reliability, including strategic undergrounding, grid modernization, and asset maintenance and renewal programs.

The Company continued to provide quality customer experiences including establishing and maintaining service, accurate and timely billing, inquiry resolution, and general customer care. Minnesota Power is very pleased to have met formal service quality expectations related to response times for customer calls in 2023 and strives to restore service in a timely manner through effective processes and prudent adoption of technology.

Minnesota Power remains committed to meeting all goals in 2024 and will increase its efforts to meet the metrics for the goals missed in 2023, including the System Average Interruption Frequency Index (“SAIFI”) goal for Overall, the Customer Average Interruption Duration Index (“CAIDI”) goal in the Northern Work Center, and the SAIFI goal in the Western Work Center. In addition to ensuring reliability of its system and caring for its customers, Minnesota Power is dedicated to helping communities and fellow utilities as they endure extreme weather event related outages.

The Company looks forward to further advancing its Energy**Forward** resource strategy, alongside the valued customers and communities we have the privilege to serve.

### **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](mailto: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 1, 2024. 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 2023 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
- ❖ 2023 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 2023. A list of acronyms is provided as Attachment D to this report.

#### D. List of Reporting Requirements

This Report provides information required by various Minnesota Rules, as well as prior Commission orders. Table 1 cross references these reporting requirements to their location within the Report.

Table 1 - 2023 Reporting Requirements

<b>NEW REPORTING REQUIREMENTS</b>		
<b>2022SRSQ Report Order Dated December 5, 2023 in Docket No. E015/M-23-75</b>		
Order Pt 2	Set Minnesota Power’s 2023 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. Required Minnesota Power to file a supplement to its 2023 SQR report 30 days after IEEE publishes the 2023 benchmarking results, with an explanation for any standards the utility did not meet.	Anticipated to be filed August 2024
Order Pt 7	Minnesota Power is required to provide CEMI (3, 4, 5, 6) and CELI (6, 12, 24), storm included, and storm excluded, for their overall system, as well as their individual service regions, until such time the Commission changes or rescinds this requirement.	Section V Pg. 55-56
<b>ON-GOING REPORTING REQUIREMENTS</b>		
<b>2021SRSQ Report Order Dated November 9, 2022 in Docket No. E015/M-22-163</b>		
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	Section I Pg. 13-14

	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.	
<b>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</b>		
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. 93-99
<b>2020 SRSQ Report Orders Dated December 2, 2021 &amp; March 2, 2022 in Docket No. E015/M-21-230</b>		
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 V, pg. 41-43
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] XX.XX% General Website XX.XX% Payment Services XX.XX% Outage map &/or Outage Info page XX.XX% Error Rate Percentage [to third decimal] XX.XXX% Payment Services* *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 expired payment methods), and/or some other meaningful categorization."	Section VII pg.67-70
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.67-70
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.67-69
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. 13-14
<b>2019 SRSQ Report Order Dated December 18, 2020 in Docket No. E015/M-20-404</b>		
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. 26

<b>2018 SRSQ Report Order Dated January 28, 2020 in Docket No. E015/M-19-254</b>		
Order Pt. 2	<p>The Commission clarifies the reporting requirements from the Commission's March 19, 2019 order, as specified in Attachment B:</p> <ol style="list-style-type: none"> <li>1. Non-normalized SAIDI, SAIFI, and CAIDI values.</li> <li>2. SAIDI, SAIFI, and CAIDI, MAIFI, CEMI, and CELI normalized values calculated using the IEEE 1366 Standard.</li> <li>3. MAIFI – normalized and non-normalized.</li> <li>4. CEMI – at normalized and non-normalized outage levels of 4, 5, and 6 interruptions.</li> <li>5. The highest number of interruptions experienced by any one customer (or feeder, if customer level is not available).</li> <li>6. CELI – at normalized and non-normalized intervals of greater than 6 hours, 12 hours, and 24 hours.</li> <li>7. The longest experienced interruption by any one customer (or feeder, if customer level is not available).</li> <li>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.</li> <li>9. Estimated restoration time accuracy, using the following windows: <ol style="list-style-type: none"> <li>a. Within -90 minutes to 0 of estimated restoration time</li> <li>b. Within 0 to +30 minutes of estimated restoration time</li> </ol> </li> <li>10. IEEE benchmarking results for SAIDI, SAIFI, CAIDI, and MAIFI from the IEEE benchmarking working group.</li> <li>11. Performance by customer class: ASAI, SAIDI, SAIFI, CAIDI, MAIFI Residential Non-normalized &amp; Normalized, Commercial Non-normalized &amp; Normalized; Industrial Non-normalized &amp; Normalized. If reporting by class is not yet possible, an explanation of when the utility will have this capability.</li> <li>12. Causes of sustained customer outages, by work center.</li> </ol>	Section V Pg. 46
<b>Reconnect Pilot Program Order Dated December 9, 2020 in Docket No. E015/M-19-766 (See pg. 4)</b>		
	<p>The Company committed to providing specific data related to its remote-reconnect pilot program (Reconnect Program)</p> <ol style="list-style-type: none"> <li>1. Number of customers participating in the remote-reconnect program;</li> <li>2. Total number of Minnesota Power customers receiving low-income home energy assistance;</li> <li>3. Number of remote-reconnect participants receiving low-income assistance;</li> <li>4. Number of customers who have opted out of the remote-reconnect program;</li> <li>5. Estimated annual cost savings from the remote-reconnect program;</li> <li>6. Average time to reconnect using the remote-reconnect program compared to the standard reconnection process; and</li> <li>7. Number of reconnections restored within 24 hours of disconnection, distinguishing between standard and remote reconnections.</li> </ol>	Section VIII Pg. 75-79
<b>Minnesota Rules 7826.0400 – 7826.2000</b>		
<b>Annual Safety Report 7826.0400</b>		
	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.	Section IV Pg. 39-40
	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	Section IV Pg. 39-40

downed wires or other electrical system failures and all remedial action taken as a result of any injuries or property damage described.	
<b>Reliability Reporting Requirements 7826.0500</b>	
The utility's SAIDI for the calendar year by work center and for its assigned service area as a whole.	Section V Pg. 46
The utility's SAIFI for the calendar year by work center and for its assigned service area as a whole.	Section V Pg. 46
The utility's CAIDI for the calendar year by work center and for its assigned service area as a whole.	Section V Pg. 46
An explanation of how the utility normalizes its reliability data to account for major storms.	Section V Pg. 47-48
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.	Section V Pg. 48-49
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.	Section V Pg. 49
A copy of each report filed under part 7826.0700 REPORTING MAJOR SERVICE INTERRUPTIONS.	Appendix A
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. 50-53
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. 53
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. 54-55
Any other information the utility considers relevant in evaluating its reliability performance over the calendar year.	Section V Pg. 55-57
<b>RELIABILITY STANDARDS 7826.0600; Subpart 1</b>	
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. 100
<b>REPORTING METER-READING PERFORMANCE 7826.1400</b>	
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"> <li>A. The numbers and percentages of customer meters read by utility personnel.</li> <li>B. The numbers and percentages of customer meters self-read by customers.</li> <li>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.</li> <li>D. Data on monthly meter-reading staffing levels, by work center or geographical area.</li> </ul>	Section VI Pgs. 58-64
<b>REPORTING INVOLUNTARY DISCONNECTIONS 7826.1500</b>	

<p>The annual service quality report must include a detailed report on involuntary disconnections of service, including, for each customer class and each calendar month:</p> <ul style="list-style-type: none"> <li>A. the number of customers who received disconnection notices;</li> <li>B. the number of customers who sought cold weather rule protection under chapter 7820 and the number who were granted cold weather rule protection;</li> <li>C. the total number of customers whose service was disconnected involuntarily and the number of these customers restored to service within 24 hours; and</li> <li>D. the number of disconnected customers restored to service by entering into a payment plan.</li> </ul>	<p>Section VIII Pgs. 71-75</p>
<b>REPORTING SERVICE EXTENSION REQUEST RESPONSE TIMES 7826.1600</b>	
<p>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:</p> <ul style="list-style-type: none"> <li>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.</li> <li>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.</li> </ul>	<p>Section VIII Pgs. 79-85</p>
<b>REPORTING CALL CENTER RESPONSE TIMES 7826.1700</b>	
<p>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.</p>	<p>Section VIII Pgs. 86-91</p>
<b>REPORTING EMERGENCY MEDICAL ACCOUNT STATUS 7826.1800</b>	
<p>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.</p>	<p>Section VIII Pgs. 91-92</p>
<b>REPORTING CUSTOMER DEPOSITS 7826.1900</b>	
<p>The annual service quality report must include the number of customers who were required to make a deposit as a condition of receiving service.</p>	<p>Section VIII Pgs. 93</p>
<b>REPORTING CUSTOMER COMPLAINTS 7826.2000</b>	
<p>The annual service quality report must include a detailed report on complaints by customer class and calendar month, including at least the following information:</p> <ul style="list-style-type: none"> <li>A. The number of complaints received;</li> <li>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;</li> <li>C. the number and percentage of complaints resolved upon initial inquiry, within ten days, and longer than ten days;</li> <li>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.</li> <li>E. The number of complaints forwarded to the utility by the Commission's Consumer Affairs Office for further investigation and action.</li> </ul>	<p>Section VIII Pgs. 93-99</p>



## 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 serves electricity to approximately 150,000 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 (about twice the width of the United States) 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.

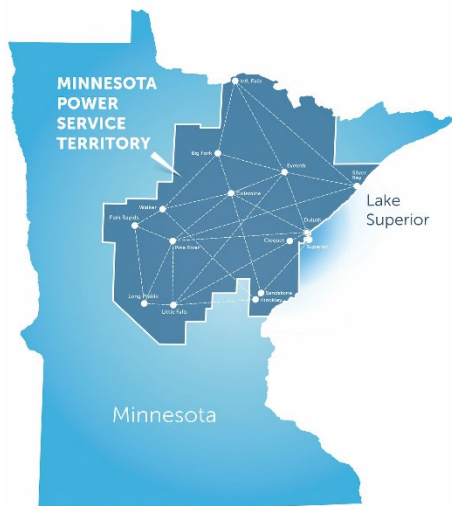


Figure 1 - Minnesota Power's Territory

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 (<5 minutes), may be a significant issue.

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

To meet the needs of its unique customer base, Minnesota Power built its distribution strategy on the foundation of technology, innovation, and continuous learning. Customers expect reliable, safe, affordable and increasingly low-carbon electric service, all of which are encompassed in the Company's distribution planning strategy. Meeting these expectations requires deploying right time/right fit distribution technology that is flexible, adaptable, and upgradable. The Company has 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,<sup>1</sup> and aligning these investments with the Company's sustainability<sup>2</sup> 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, integrity, environmental stewardship, employee development, and community engagement must be in the balance of every decision made and action taken.

The public summary communication regarding Minnesota Power's 2023 SRSQ results is included below.

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<sup>1</sup> *In the Matter of Minnesota Power's 2023 Integrated Distribution Plan*, Docket No. E015/M-23-258, 2023 Integrated Distribution Plan, at 9 (Oct. 16, 2023).

<sup>2</sup> 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).

# 2023 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 about 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

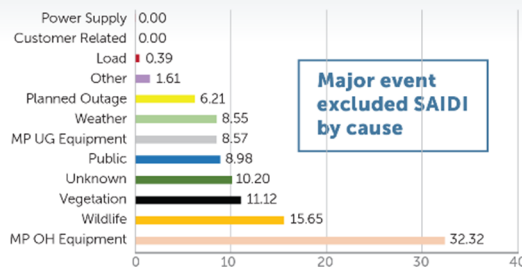
Minnesota Power is dedicated to providing safe, reliable, affordable and increasingly clean electric service and to achieving high levels of customer satisfaction.

- In 2023, 104 lineworkers and 21 substation technicians responded to trouble calls and worked on maintenance of our distribution lines and associated equipment.
- In 2023, 76 employees working in a variety of positions, including vegetation management, fleet, inventory, service dispatch, and system operations, provided line operation support.

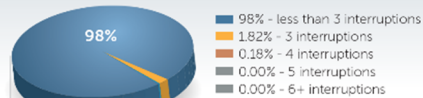


## SYSTEM RESILIENCY

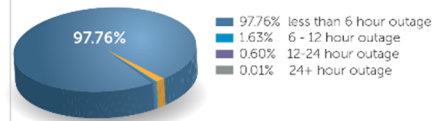
Interruptions are the total loss of electric power to one or more customers connected to the distribution system.



98% of customers experienced less than 3 interruptions in 2023



Almost 98% of customers experienced less than 6 hours of outage in 2023



### What causes interruptions?

During 2023 Minnesota Power's service territory experienced mild weather. As a result, equipment failure, wildlife and vegetation were the leading causes of interruptions. Minnesota Power continues to invest in and execute reliability and resiliency initiatives to strengthen the company's system.

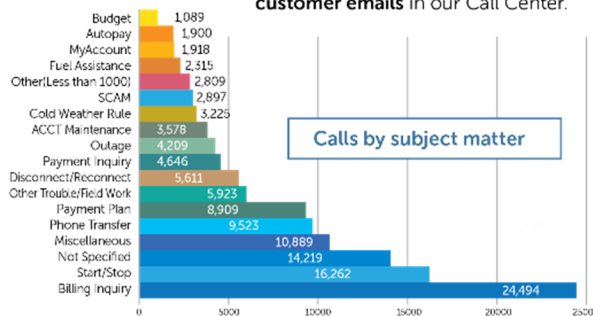
### We work to minimize weather-related outages in a variety of ways, including:

- 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 intellirupters and motor operated switches.

24057

### CALL CENTER

In 2023, we received nearly 132,823 customer calls, and just over 17,065 customer emails in our Call Center.



### COMPANY READ METERS:

In 2023, our meter reading systems provided over **99.92% of meters read** cross all customer classes. For residential customers, **99.92% of the reads** used for billing were through our systems or employees and less than **0.08% 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 Assistant 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 wind storms, 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 an historic winter storm in the company's service area in 2022, 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](http://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](http://mnpower.com); through MyAccount at [mnpower.com/myaccount](http://mnpower.com/myaccount); and via the Minnesota Power app.

#### NEED INFORMATION OR ASSISTANCE?

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

#### REPORT AN OUTAGE OR ENTER A TROUBLE ORDER:

[www.mnpower.com/OutageCenter/ReportAnOutage](http://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](http://www.mnpower.com).



Figure 2 - Minnesota Power's Public Summary for 2023

## II. 2023 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. The Company continues to see a recent trend in storms occurring outside of the normal storm season, with many larger storms occurring during typically quiet months. This trend continued in 2023 as there was one major event excluded storm which occurred on April 20, 2023.

Grid modernization efforts increased substantially with strategic undergrounding, recloser and IntelliRupter rollouts, and preventative maintenance activities. However, these efforts encountered supply chain challenges, inflation, and labor shortages again in 2023. 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 improved in 2023 with call response times meeting requirements. In 2023, Minnesota Power's Call Center returned to optimal staffing and met the annual target of answering 80 percent of calls within 20 seconds. Minnesota Power continues to work with customers on payment agreements, assistance program funding, and many other topics while maintaining acceptable call response times.

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 December 5, 2023 Order in Docket No. E015/M-23-75, the Commission set Minnesota

Power’s 2023 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 39.4 minutes, and CAIDI by 44.67 minutes. The Company did not meet the SAIFI target, missing it by 0.05 interruptions per customer.

Based on the standards for small utilities,<sup>3</sup> the Company met these major event-excluded IEEE 2nd quartile target goal for SAIDI in the Central, Northern, and Western Work Centers by 114.32, 43.93, and 68.60, respectively.

For SAIFI, the Company met the goal in the Central and Northern Work Centers by 0.49 and 0.32 respectively but failed to meet this goal in the Western Work Center by 0.29. Lastly, the Company met the goal for CAIDI in the Central and Western Work Centers by 37.40 and 51.17, respectively, but failed to meet this goal in the Northern Work Center by 14.21.

Table 2 - 2023 Overall & Work Center Reliability Results in Comparison to IEEE Standard

Year 2023	SAIDI	SAIFI	CAIDI
<b>IEEE 2022 Medium Utilities 2<sup>nd</sup> Quartile</b>	<b>143</b>	<b>1.11</b>	<b>134</b>
<b>Results- Overall</b>	103.60	1.16	89.33
<b>IEEE 2022 Small Utilities 2<sup>nd</sup> Quartile</b>	<b>193</b>	<b>1.39</b>	<b>125</b>
<b>Results- Central</b>	78.68	0.90	87.60
<b>Results- Northern</b>	149.07	1.07	139.21
<b>Results- Western</b>	124.40	1.68	73.83

\*Red indicates goal not met

For all SAIDI values throughout 2023, including the one major event day, there were more than 4,758 unique sustained outages (over five minutes in duration), of which 68 Large

<sup>3</sup> 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.

SAIDI Events (greater than 50,000 CMI) contributed more than 44.8 percent of overall SAIDI. The Company is experiencing a greater number of larger SAIDI events with only a slight increase in the major event exclusion threshold. These non-excluded larger events account for a significant amount of the Company’s SAIDI minutes.

In Figure 3 below, the Company shows a decrease in the total number of incidents (all power interruptions), including momentary outages, compared to 2022.

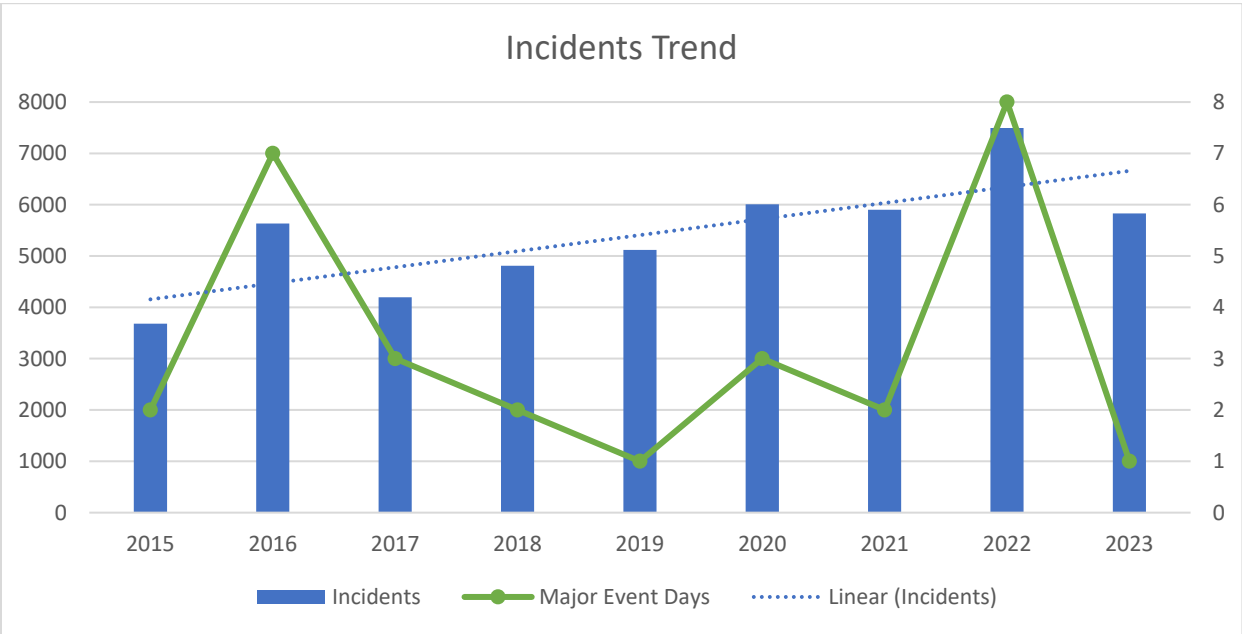


Figure 3 - 2023 Incident Trends

In total, the Company experienced about 5,800 incidents in 2023. Figure 3 illustrates the trend in these incidents and the correlation to Major Events Days since 2015. Years with higher than “Linear Incidents” trend line occur during years with higher storm activity such as 2016 and 2022. Advances in system technology throughout this period are improving the visibility across the entire distribution system. The technology advances include the rollout of Advanced Metering Infrastructure (“AMI”) and the systematic replacement of obsolete voltage and outage sensors with smart grid line sensors. This improved visibility is in part responsible for the increase in the number of detected and recorded incidents. 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, overhead equipment failure attributed to 32 percent, wildlife events 16 percent, vegetation events 11 percent,<sup>4</sup> unknown 10 percent, public events (car accidents, excavation damage to cables, etc.) 9 percent and weather events 9 percent. The remaining outage minutes consisted of incidents related to planned outages, underground equipment failures, and other causes. (More on causes of outages can be found in Section V of this Report.)

MP overhead equipment was the largest reliability factor contributing to outages in 2023. Asset renewal programs such as switch and cutout replacements, along with TripSavers to replace porcelain cutouts, are expected to aid improvement of this category. In addition, 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. The PM program for voltage regulators will be rolled out in 2024. All voltage regulator units are catalogued, and work continues to build a procedure to refurbish or replace aging units.

In the future, the PM program will expand its focus to include the replacement or refurbishment of transformers. By focusing on all PM programs, the Company can verify at any time that system equipment is functioning as expected. PM reviews will also more readily identify<sup>5</sup> areas that may need additional asset renewal or replacements. Strategic undergrounding efforts were also continued in 2023 and are ongoing on some of the Company’s worst performing overhead lines. For the 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 2023, over 33 miles of

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<sup>4</sup> See pages 31-34 for details on the Company’s vegetation management program.

<sup>5</sup> For more information regarding the Company’s reliability improvement efforts, including strategic undergrounding and asset renewal, please see Section II of Minnesota Power’s 2023 Integrated Distribution Plan in Docket No. E015/M-23-258.



underground was installed across our distribution system including the conversion of overhead facilities to underground.

In Figure 4 below, there are four graphs that depict Major Event-excluded SAIDI values by cause. These graphs are in units of Company SAIDI minutes and display Company Total, Central Work Center, Northern Work Center, and Western Work Center, sorted by cause in descending order for Total Company values.

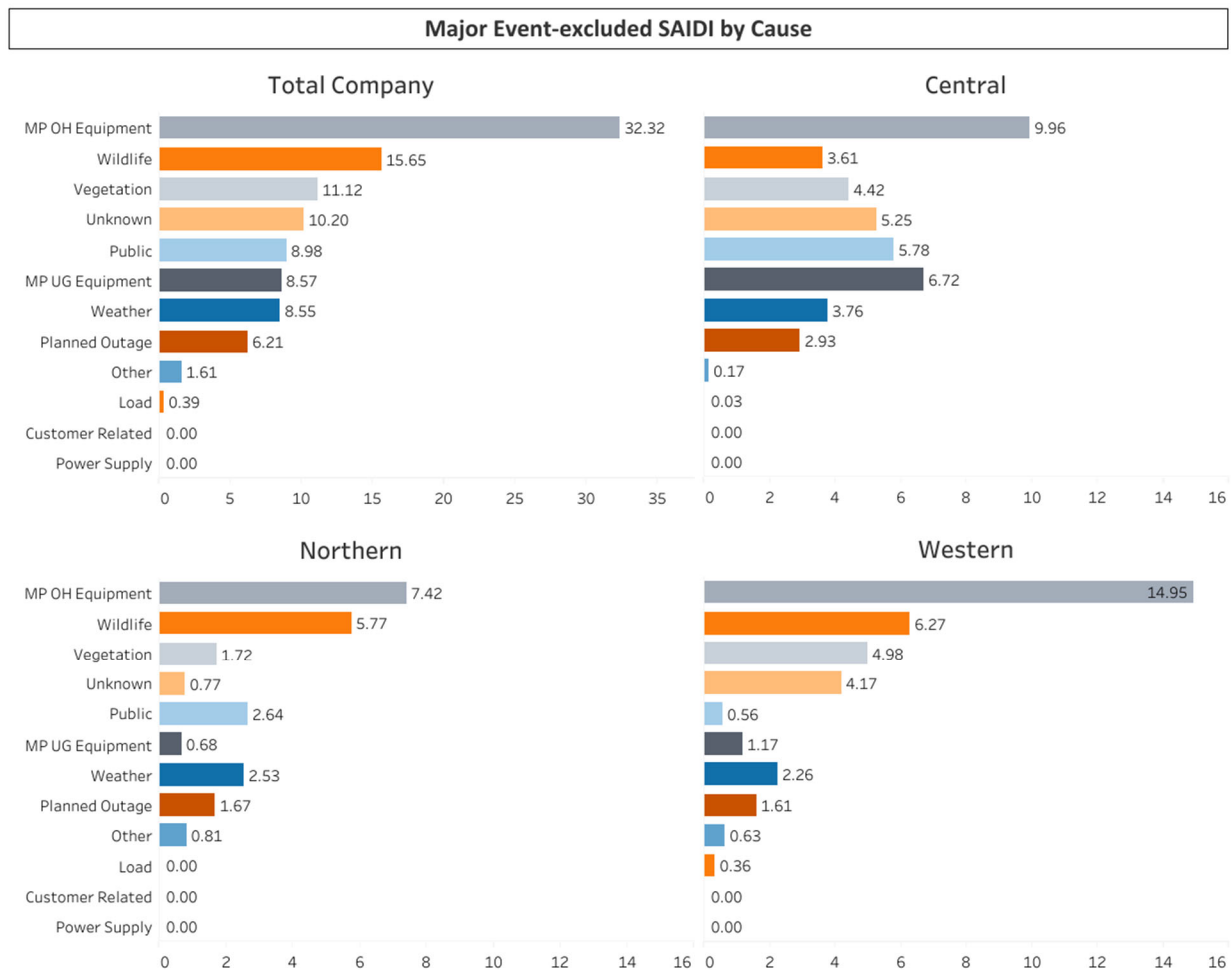


Figure 4 - Major Event-excluded SAIDI Results

In Figure 5 below, there are four graphs that depict Major Event-excluded SAIFI values by cause. The graphs are in units of Company SAIFI interruption frequency values. These graphs display Company Total, Central Work Center, Northern Work Center, and Western Work Center sorted by cause in descending order for Total Company values.

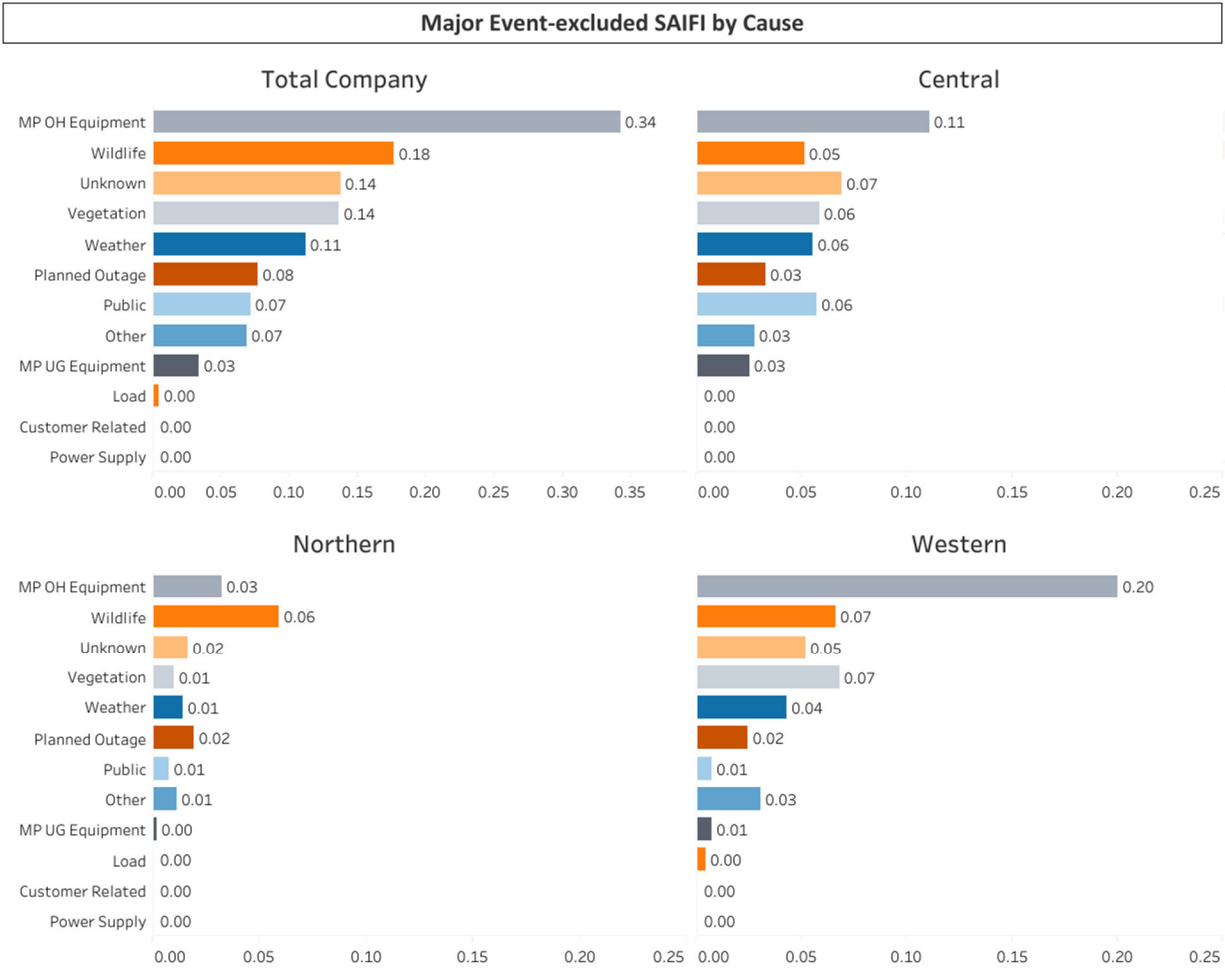


Figure 5 - Major Event-excluded SAIFI Results

### B. Reliability Cost Overview

The following graphs show the 2023 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. The Company experienced a decrease in trouble costs in 2023 due to milder-than-average weather. There was just one major event exclusion, which is below the five-year average.

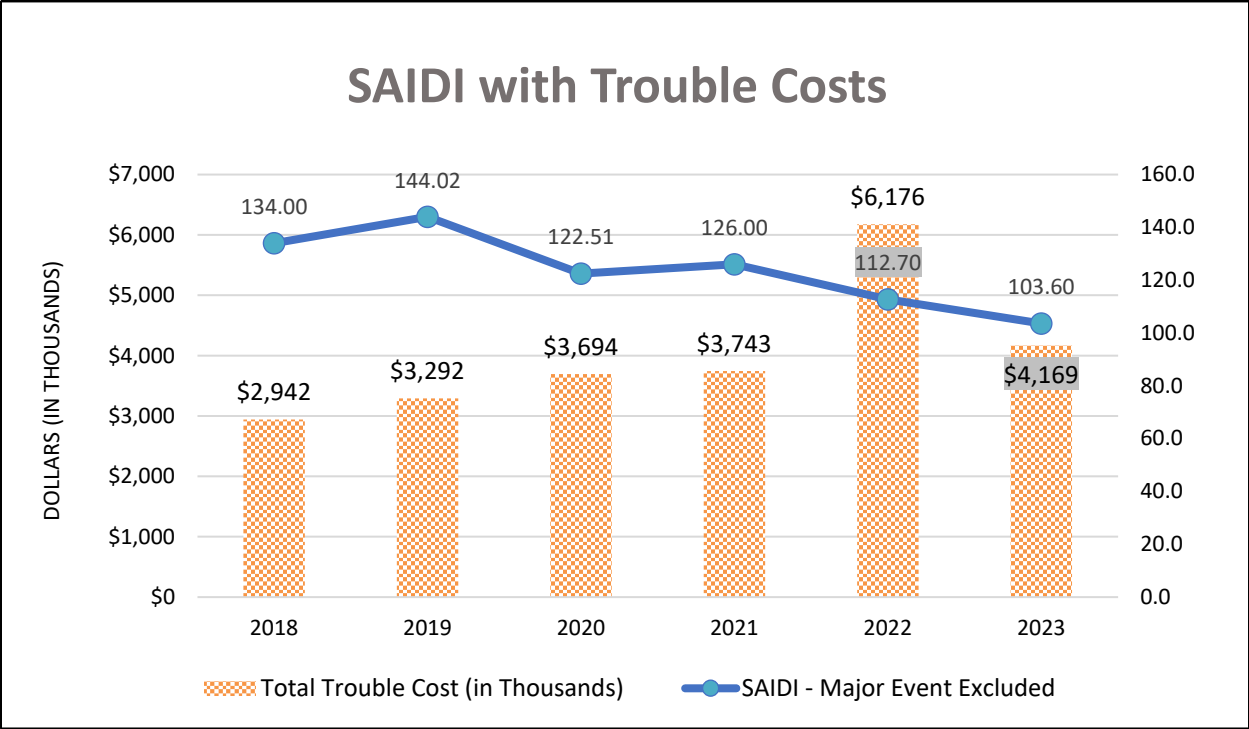


Figure 6 - SAIDI with Trouble Costs (In Thousands)

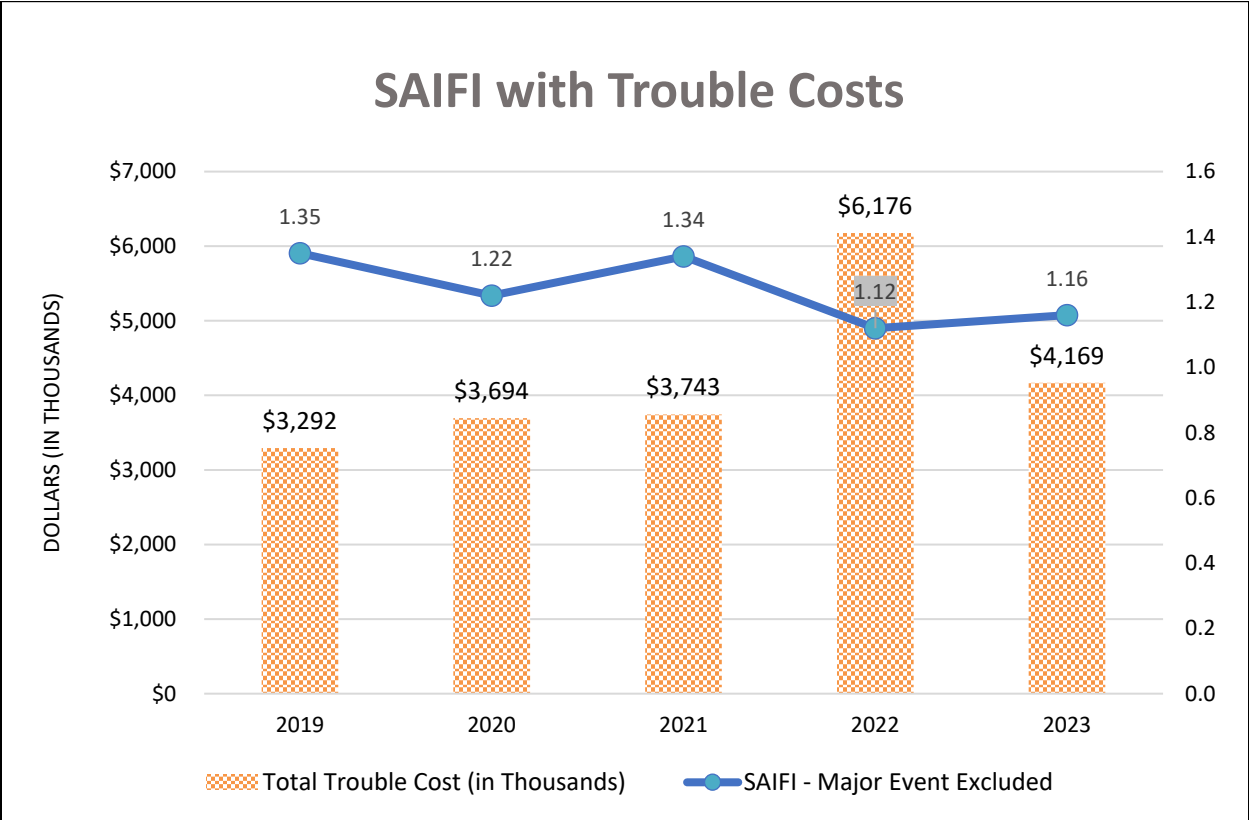


Figure 7 - SAIFI with Trouble Costs (In Thousands)

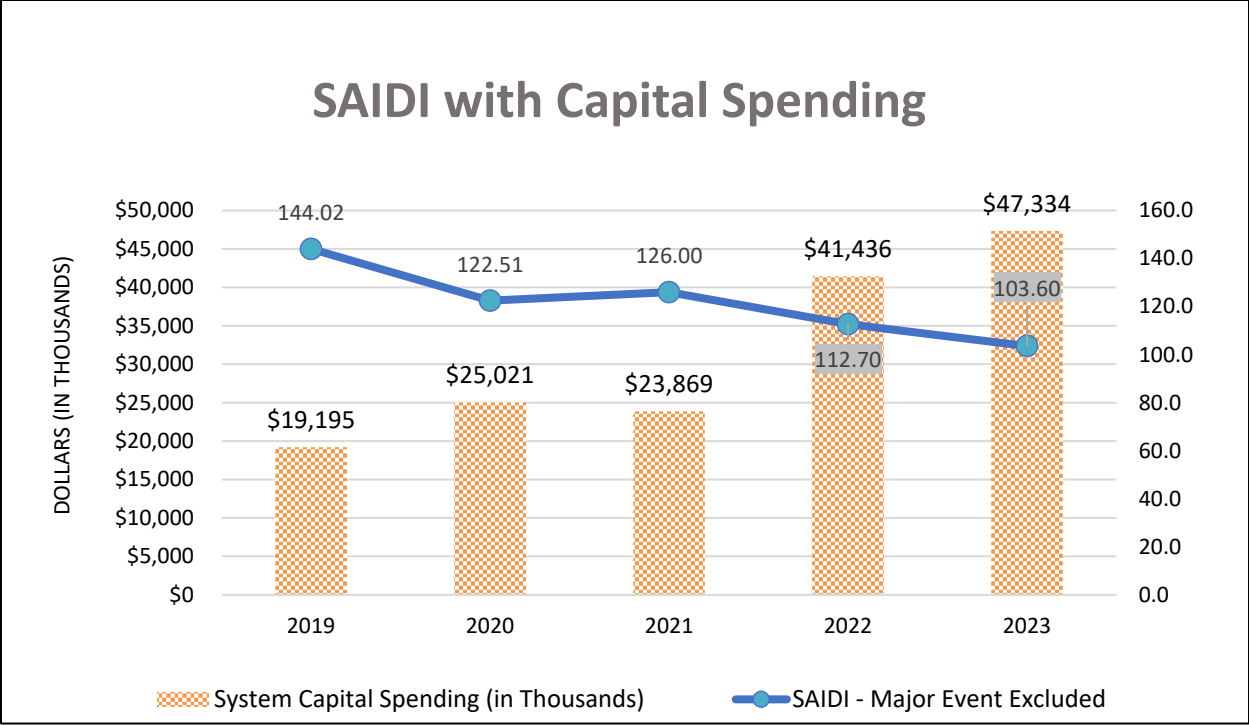


Figure 8 - Major Event-excluded SAIDI with Capital Spending (In Thousands)

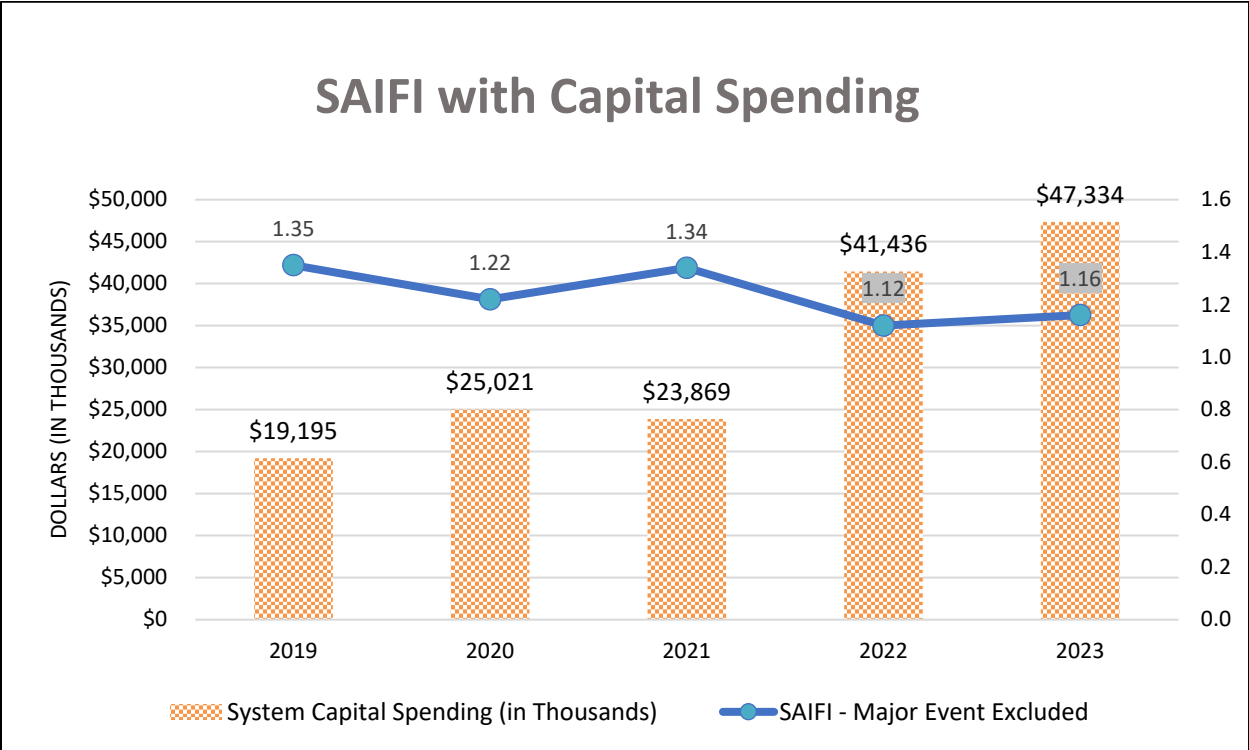


Figure 9 - Major Event-excluded SAIFI with Capital Spending (In Thousands)

As communicated in Minnesota Power’s 2023 Integrated Distribution Plan (“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
Switchgear Replacement Program (Asset Renewal)	\$8.0M \$4.2M	2026 2028	<i>Anticipated Substations*:</i> Haines Road (Hermantown) Colbyville (Duluth) <i>*Subject to change based on asset renewal project prioritization</i>
Substation Modernization Program (Asset Renewal)	\$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 <i>*Subject to change based on asset renewal project prioritization</i>
Cloquet Area 34 kV Expansion	\$2.2M \$6.6M	2023 2025	Canosia Road (Esko), Mahtowa

### **III. Grid Modernization, System Construction and Protection**

The following section outlines the Company's efforts to modernize and strengthen the distribution system to maintain reliable, safe, and affordable – and increasingly resilient – energy to meet customer and stakeholder expectations.

#### **A. Grid Modernization**

Grid Modernization Projects are efforts that go beyond the Company's baseline efforts to maintain reliable, safe, and affordable energy, but are necessary to keep pace with changing technology, regulatory requirements, and customer expectations.

Grid modernization continues to be a priority for Minnesota Power. 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 to target areas known or likely to impact customer reliability and system resiliency. The Company 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 initiated to modernize all the individual substation components into a complete substation modernization project designed to efficiently address all the asset renewal needs at once (See Table 3).

Reliability improvements will continue to be implemented. A key component to improving reliability is to harden the system to be more resilient to storms via strategic undergrounding. The Company is also deploying equipment such as TripSavers, smart sensors, motor-operated equipment, intelligent reclosers and IntelliRupters. IntelliRupters are a FLISR technology, (*Fault Location, Isolation, and Service Restoration*) that utilize a secure fiber optic network to quickly isolate and restore customers automatically. This is possible when a group of IntelliRupters (IntelliRupter team) reconfigures the feeder to isolate the fault and reroute power to customers downstream of the fault.

The Company will expand the use of TripSavers, which are maintenance free and significantly lower cost than traditional oil-filled reclosers that have historically been used for similar applications. TripSavers are also being installed to replace cutouts, including porcelain fused cutouts that are nearing the end of their useful life. TripSavers clear temporary faults, resulting in improved reliability and reduced incidents requiring a lineworker 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 2023, the Company has continued with the TripSaver program by refining settings, fuse coordination, and location selection. There are now 292 TripSavers on our system with the updated settings. To evaluate the effectiveness of this program, units were tested and verified to function as intended. System reliability improvements with TripSavers are detailed in Table 4 below. Ten reclosers were installed or replaced across the Company's system to further sectionalize long distribution feeders. These modifications typically reduce the number of customers impacted by a single event. Additionally, thirteen IntelliRupters were put in service with an additional thirteen installed and in process of being put in service in early 2024.

Motor-operated switches are being added to improve system controllability. These switches will be able to be operated remotely by the system operators. This remote operation can dramatically reduce outage times, especially when switch locations are remote or have limited access.

Throughout 2023, the smart grid line sensors continued to monitor distribution feeders and detect issues, including recurring momentary outages on several feeders. In one example, eight momentary outages were detected on a single feeder, the line crew patrolled the feeder and found some cracked insulators that were tracking and burning the crossarm. These insulators were quickly replaced and no additional momentaries were detected throughout the remainder of the year. This proactive identification and repair likely prevented a sustained outage for all 387 customers on this feeder.

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			
Year	SAIDI	SAIFI	MAIFI	CAIDI	SAIDI	SAIFI	MAIFI	CAIDI	
<b>Before Install 5 Year Avg. (2006-2010)</b>	195.37	1.47	7.80	132.90	55.32	0.66	7.40	83.82	
2023	53.76	0.43	11.95	125.02	53.76	0.43	10.95	125.02	
RGV-256 IntelliRupters installed 2012		Storm Included				Storm Excluded			
Year	SAIDI	SAIFI	MAIFI	CAIDI	SAIDI	SAIFI	MAIFI	CAIDI	
<b>Before Install 5 Year Avg. (2007-2011)</b>	143.72	0.60	3.20	239.53	24.23	0.32	1.80	75.72	
2023	19.31	0.28	0.00	68.96	16.69	0.28	0.00	59.61	
SLA-203 IntelliRupters installed 2015		Storm Included				Storm Excluded			
Year	SAIDI	SAIFI	MAIFI	CAIDI	SAIDI	SAIFI	MAIFI	CAIDI	
2023	21.94	1.00	1.88	22.00	21.94	1.00	1.88	22.00	
LSP-208 IntelliRupters installed 2015		Storm Included				Storm Excluded			
Year	SAIDI	SAIFI	MAIFI	CAIDI	SAIDI	SAIFI	MAIFI	CAIDI	
2023	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	
<b>Before Install 5 Year Avg. (2011-2015)</b>	238.55	1.25	0.00	190.84	234.72	1.25	0.00	187.78	
2023	133.86	1.91	0.00	70.26	133.86	1.91	0.00	70.26	
COL-240 TripSavers installed 2018		Storm Included				Storm Excluded			
Year	SAIDI	SAIFI	MAIFI	CAIDI	SAIDI	SAIFI	MAIFI	CAIDI	
<b>Before Install 5 Year Avg. (2012-2017 no 2016)</b>	116.82	1.22	1.78	95.75	106.35	1.16	1.58	91.68	
2023	63.94	0.83	0.09	77.04	39.97	0.66	0.09	60.56	
PQT/BAX-531 IntelliRupters installed 2022		Storm Included				Storm Excluded			
Year	SAIDI	SAIFI	MAIFI	CAIDI	SAIDI	SAIFI	MAIFI	CAIDI	
<b>Before Install 5 Year Avg. (2017-2021)</b>	102.82	0.67	2.60	154.12	35.44	0.38	2.42	92.63	
2023	0.00	0.00	5.24	0.00	0.00	0.00	5.24	0.00	



In Table 4, some of the feeders listed are bulk feeders, with few or no customers. Reliability statistics are directly tied to customer outages. As a result, the impact of the grid modification projects can be quantified by including these bulk feeders' impact on their step-down substations and feeders connected to them. The events that occurred on the improved bulk feeders were compiled to build accurate statistics that involved all affected customers.

The late winter storm on April 20, 2023, highlighted the benefits of the IntelliRupter team on the Ridgeview 252 feeder, in the Duluth area. A fault was detected on the feeder, instantly isolated the local faulted section, and 3,034 customers were automatically restored with only a momentary outage observed to the upstream customers. Some neighboring feeders serving about 4,200 customers were also impacted by the storm and saw an average of 245 minutes (about 4 hours) of outage time. These neighboring feeders are planned to receive similar grid modification improvements soon.

A similar result occurred in the Western Work Center on June 30, 2023. The PQT/BAX 531 feeder IntelliRupter team identified a fault, isolated the fault, and prevented a sustained outage. About half of the 4,406 customers experienced a momentary outage while the other half were unaffected by the downstream issue. The line crew followed up and performed repairs in the faulted section before returning the feeder to its normal configuration. Previous to the addition of the IntelliRupter team, customers would have experienced a sustained outage for the duration of the manual switching procedure and possibly the duration of the repair time. Feeder PQT/BAX 531 significantly improved and had a 100 percent reduction in SAIDI and SAIFI metrics.

Feeders SLA-203 and LSP-208 are a special case. These feeders were built with IntelliRupters already installed. As a result, there is no previous 5-year history to compare to 2023 reliability. Subjectively, both feeders perform very well. The feeders with TripSavers installed experienced a 45 to 62 percent reduction in SAIDI minutes.

## **B. Mobile Workforce Applications**

Minnesota Power has developed several Mobile Workforce applications that allow all field employees to identify and improve areas of concern on the system. Minnesota Power has implemented Mobile Workforce in multiple phases, including:

- Paperless processing was created for maintenance issues on our system (2017).
- Trouble tickets from the Outage Management System were pushed to lineworkers in the field, allowing trouble tickets to be processed electronically within that application (2019).
- An application was created that allowed lineworkers to inspect feeders and submit issues in need of repair (2020).
- A mobile application used for storm response was rolled out (2022).
- The Company implemented scheduling software to optimize work assignments (2023).

Minnesota Power is developing digital work packets that 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 those areas could also report and resolve issues discovered within substations.

In 2019, processing trouble tickets was moved to a mobile workforce application called VxField. There has been considerable success in managing and completing these tickets online, eliminating many phone calls and a paper process, as shown in Table 5 below.<sup>6</sup>

Table 5 - Mobile Application Tickets Entered

Year	Tickets Entered
2019	2,933
2020	9,588
2021	9,623
2022	14,057
2023	11,333

This improved process allows lineworkers 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 application was created for line personnel to actively inspect, address issues and track issue resolution on distribution feeders. This application 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 past four years, 51 feeder inspections were fully completed.

Additionally, an application called Quick Capture was created in 2022 to assist in storm response. It allows multiple assessors to quickly collect system conditions to help operations prioritize and plan the restoration effort. Lastly, EzMaxPlanner, an add-on scheduling tool for Maximo was implemented in late December 2023. This business solution is designed to assist planners with expanded capabilities for crew management and work order assignments.

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<sup>6</sup> The increased number of tickets entered for 2022 is attributed to the higher number of weather events as shown in Figure 3.

### **C. Voltage Monitoring**

Smart grid line sensors replaced obsolete line voltage and outage monitors starting 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.<sup>7</sup> This information is sent to area engineers, supervisors, and line personnel as events happen on the feeders.

Voltage monitoring is also managed through the Company's AMI system and a report is generated monthly to identify areas that need to be reviewed for improvements. In addition to these sources, the Company's outage management system ("OMS") allows service dispatch to coordinate line crew efforts to find and repair voltage-related issues.

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<sup>7</sup> 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.

## **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 numerous 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 10 presents Minnesota Power’s budget to spend for vegetation management over the past five years.

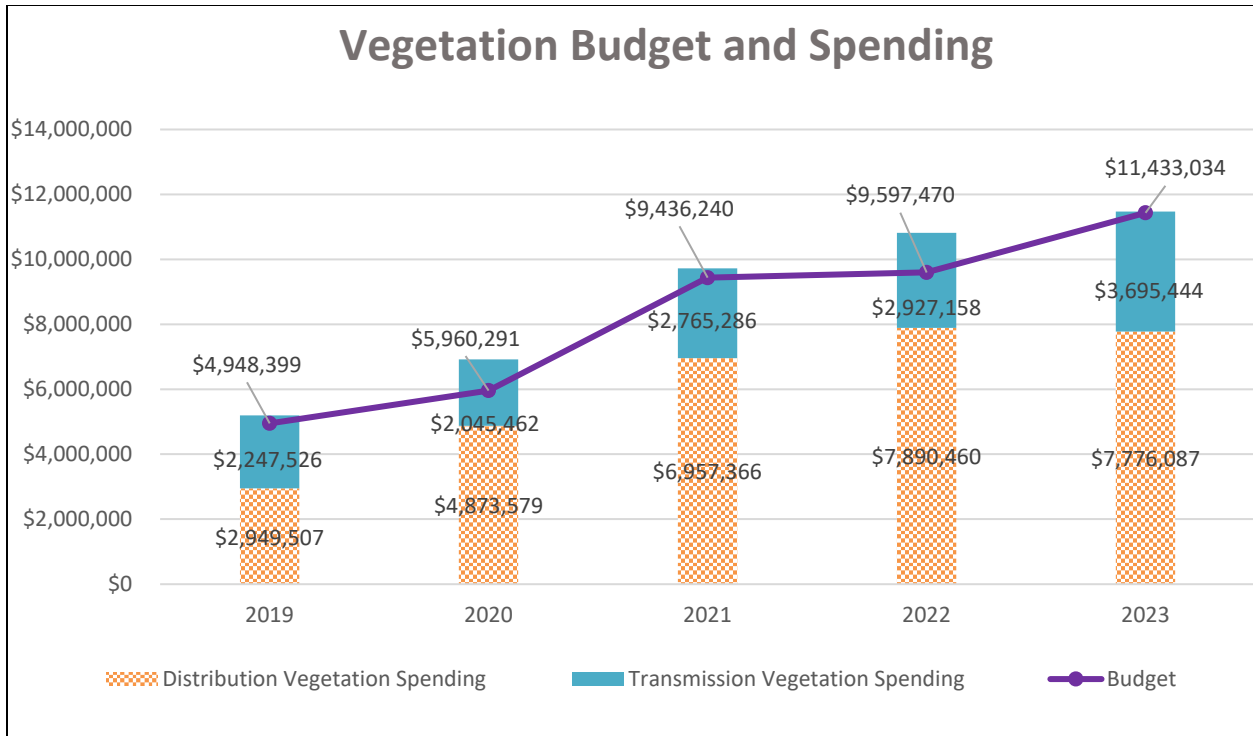


Figure 10 - Vegetation Budget and Spend 2019 - 2023

Minnesota Power’s vegetation management program for its distribution system manages 313 electrical circuits spanning 4,544 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. 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. As such, 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, 2023. Together they represent 16.6 percent of the Company's total distribution system by line miles. All but two circuits are scheduled to be completed in 2024.

Table 6 - Circuits Outside of 6-Year Trimming Cycle

Sub	Feeder	Mileage	Last Done	Scheduled	Years
<b>ASK-6521</b>	Askov 6521	30.3	2017	2024	7
<b>BAR-6421</b>	Barnum 6421	51.1	2017	2024	7
<b>BRW-1</b>	Browerville 1	5.9	2017	2024	7
<b>BRW-2</b>	Browerville 2	26.0	2017	2024	7
<b>CLR-1</b>	Clarissa 1	12.0	2017	2024	7
<b>CLR-2</b>	Clarissa 2	18.0	2017	2024	7
<b>DEN-6431</b>	Denham 6431	55.4	2017	2024	7
<b>EGB-1</b>	Eagle Bend 1	36.7	2017	2024	7
<b>GGR-1</b>	Gutches Grove 1	31.6	2017	2024	7
<b>HAT-321</b>	Hat Trick 321	36.1	2017	2024	7
<b>HAT-332</b>	Hat Trick 332	23.1	2017	2024	7
<b>HEW-1</b>	Hewitt 1	22.8	2017	2024	7
<b>HPS-1</b>	Harts Press	4.2	2017	2024	7
<b>LCH-2</b>	Lake Charlotte 2	66.5	2017	2024	7
<b>LFE-1</b>	Little Falls East 1	5.9	2017	2024	7
<b>LFL-525</b>	Little Falls 525	9.9	2017	2024	7
<b>LFL-529</b>	Little Falls 529	37.3	2017	2024	7
<b>LFL-536</b>	Little Falls 536	12.6	2017	2024	7
<b>LGP-1</b>	Long Prairie Rural 1	34.1	2017	2024	7
<b>LLK-1</b>	Long Lake 1 (Long Prairie)	7.7	2017	2024	7

<b>LPD-2</b>	Long Prairie 2	8.2	2017	2024	7
<b>LPN-1</b>	Long Prairie North 1	3.6	2017	2024	7
<b>LPR-501</b>	Long Prairie 501	11.8	2017	2024	7
<b>LPR-527</b>	Long Prairie 527	11.7	2017	2024	7
<b>LPR-535</b>	Long Prairie 535	14.1	2017	2024	7
<b>SYN-1</b>	Sylvan 1	16.1	2017	2024	7
<b>VRG-301</b>	Virginia 301	0.3	2017	2024	7
<b>VRG-302</b>	Virginia 302	23.0	2017	2024	7
<b>VRG-303</b>	Virginia 303	4.0	2017	2024	7
<b>VRG-304</b>	Virginia 304	3.0	2017	2024	7
<b>VRG-305</b>	Virginia 305	2.7	2017	2024	7
<b>VRG-306</b>	Virginia 306	0.3	2017	2024	7
<b>VRG-311</b>	Virginia 311	28.1	2017	2024	7
<b>RGV-253*</b>	Ridgeview 253	62.1	2016	2024	8
<b>GRY-200</b>	Gary 200	20.5	2017	2025	8
<b>GRY-201</b>	Gary 201	<u>17.2</u>	2017	2025	8
	<b>Total</b>	<b>753.9</b>			

\*Not completed in 2023 as indicated in the 2022 SRSQ report

**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 ninth year of its second complete ten-year cycle. The Company estimates that the average age of the poles in its service territory are close to 40 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 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 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 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.

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

Minnesota Power is pleased to report that the Company did not require mutual aid support from other utilities in 2023. Likewise, the Company did not need to provide mutual aid.

## G. Emergency Response and 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.



Figure 11 - ALLETE Chair, President and CEO Bethany Owen accepts the Emergency Response Award from EEI President Tom Kuhn on June 12 at the 2023 EEI convention in Austin, Texas

On June 12, 2023, Minnesota Power was awarded the Edison Electric Institute's Emergency Response Award for restoring power after a historic winter storm hit Minnesota Power's service area on December 14, 2022, dropping up to two feet of heavy, wet snow driven by strong winds. The weight of the snow and the high winds left behind a tangle of broken trees and limbs in many areas, complicating access to remote power lines that sustained damage. About 14,800 customers were without power by the morning of December 15, 2022, and Minnesota Power reported at least 100 wires down. Deep snow hampered travel to the affected areas and slowed the overall response. Crews working 16-hour days used snowmobiles and other tracked vehicles to patrol power lines where roads were not yet plowed.

Minnesota Power has a long history of assisting other utilities when needed. In 2021, Minnesota Power assisted Con Edison after a nor'easter<sup>8</sup> damaged underground electric systems in New York City. In 2020, Minnesota Power and Superior Water, Light, & Power assisted Ameren in restoring power to thousands of customers after a derecho<sup>9</sup> event caused widespread severe wind damage across Iowa, northern Illinois, and northern Indiana. In 2019, Minnesota Power and SWL&P assisted Manitoba Hydro in restoring power after Manitoba was hit with heavy snow and high winds in a slow-moving storm. Crews have also joined hurricane responses six times in the past 15 years, including in Florida, Ohio, Maryland, New Jersey; and in Puerto Rico from late 2017 into early 2018 after Hurricanes Irma and Maria. Additionally, in 2018, Minnesota Power foresters helped Pacific Gas and Electric inspect and clear burned and dangerous trees from power line easements in the area affected by the Camp Fire, the deadliest wildfire in California history.

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<sup>8</sup> Nor'easters are large, intense areas of low pressure that typically develop off the East Coast during the late fall, winter and early spring.

<sup>9</sup> A derecho event is a widespread, long-lived windstorm associated with rapidly moving showers or thunderstorms.

## IV. Safety Reporting

Safety is a core value at Minnesota Power. The Company has committed to be injury-free at work, at home and in our communities. Per Minn. Rule 7826.0400, the Company provides important safety information for customers on its website<sup>10</sup> addressing topics including: Call Before You Dig; Outdoor Safety; Electrical Safety at Home; Electrical Safety at Work; Electrical Safety for Emergency Responders; Outage Preparedness and Restoration; and Please Drive Safely Around Our Crews.

### 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 7 - 2023 OSHA Reportable Injuries

#### Number of Cases

Deaths	Total number of cases with days away from work	Job transfer or restriction	Other recordable cases
<b>0</b>	<b>4</b>	<b>10</b>	<b>12</b>

#### Number of Days

Days of job transfer or restriction	Days away from work
<b>687</b>	<b>91</b>

#### Injury and Illness Types

Injuries	Skin disorders	Respiratory conditions	Poisonings	All other illnesses
<b>22</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>1</b>

<sup>10</sup> <https://www.mnpower.com/CustomerService/safety>.

**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 were no incidents in 2023 in which a response to downed wires resulted in injuries requiring medical attention.

A listing of all incidents in which property damage resulting in compensation occurred due to downed wires or other electrical system failures and the remedial actions taken is included in Table 8.

Table 8 - 2023 Damage Claims Paid

Date	Cause of Damage	Paid
01-10-2023	Zipline/Tree damage	\$5,900.00
02-08-2023	Vehicle Damage	\$284.83
02-17-2023	Electrician's Invoice - MP Equipment Issue	\$217.50
03-07-2023	Power Surge	\$271.25
03-11-2023	Electrician's Invoice - MP Equipment Issue	\$950.00
03-22-2023	Power Surge	\$1,351.83
03-22-2023	Power Surge	\$4,708.51
03-22-2023	Power Surge	\$1,639.89
03-22-2023	Power Surge	\$2,523.65
03-22-2023	Power Surge	\$198.00
03-24-2023	Field Error at Transformer	\$1,167.50
04-05-2023	Vehicle Damage	\$2,908.42
04-05-2023	Vehicle Damage	\$3,786.81
04-20-2023	Power Surge	\$3,252.96
04-20-2023	Power Surge	\$4,247.62
04-20-2023	Street Sign Damage	\$121.76
10-23-2023	Vehicle Damage	\$1,792.46
<b>Total Payment for 17 Claims:</b>		<b>\$35,322.99</b>

## 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 2023, the Company provided over 99.9 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 windstorms, ice storms, etc., are below the exclusion threshold and are included in the reliability calculations. Since there was one excluded event in 2023, the Major Event-Excluded values are different from the Major Event-Included values.

### A. Work Centers

In compliance with Order Point 4 of the Commission's March 2, 2022, Order, which established future SRSQ reporting guidelines, Figure 12 shows the location of the Company's three Work Centers.

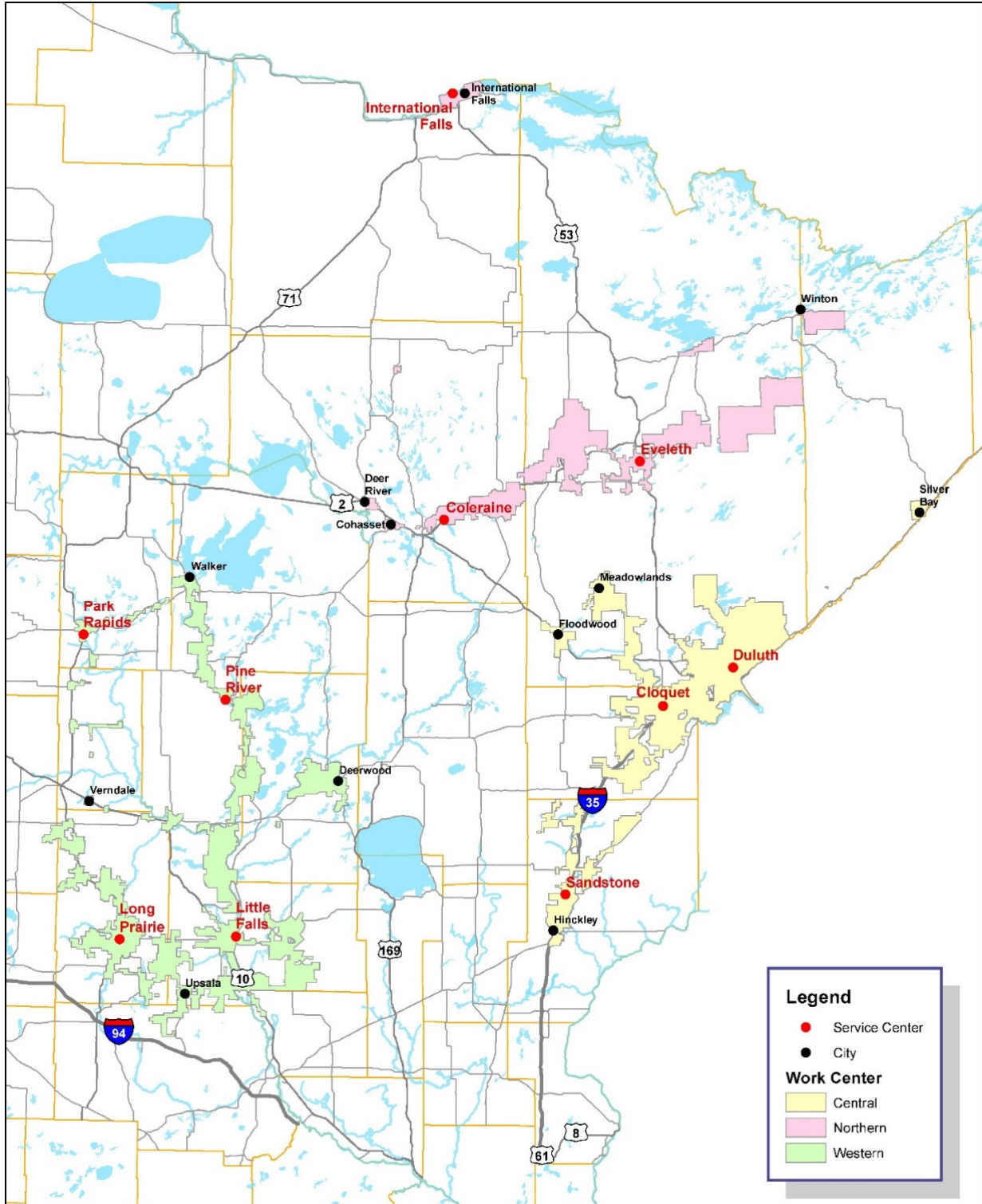


Figure 12 - Location of Central, Northern & Western Work Centers

The Central Work Center includes service centers in Duluth, Cloquet, and Sandstone, with a customer count of over 78,100, as determined by service points. This area is by



far the most populous and contains Duluth, the largest city within the Company's service territory. 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 number of customers, with a count of just over 23,200, 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 42,800 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, Order<sup>11</sup> 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<sup>12</sup> 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 consider various reporting methods, system terrain/age, and customer mix. 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

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<sup>11</sup> 2018 Safety, Reliability and Service Quality Report (Docket No. E015/M-19-254).

<sup>12</sup> 2021 Safety, Reliability and Service Quality Report (Docket No. E015/M-22-163).

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 measurements and efforts. Figure 13 identifies the regions represented by the participants in the 2023 Benchmark Study (results to be released later in 2024). As required by Order Point 2 of the December 5, 2023, Order, the Company will file a supplemental filing to its 2023 SRSQ Report within 30 days after IEEE publishes the 2023 benchmarking results, including an explanation for any standards Minnesota Power did not meet.

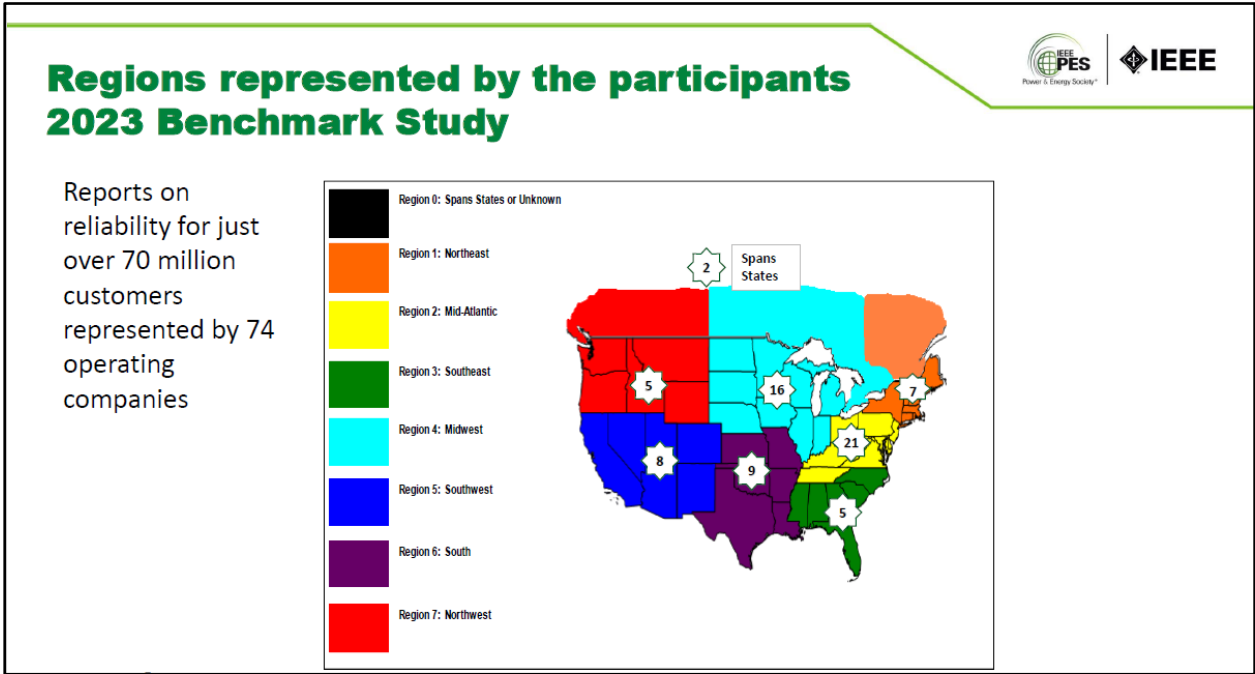


Figure 13 - IEEE Benchmarking Participants

**C. Minn. Rule 7826.0500 Annual Reliability Reporting**

Per Subpart 1 of Minn. Rule 7826.0500, *[on 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 9.

Table 9 - SAIDI, SAIFI, CAIDI, MAIFI, and ASAI by Overall & Work Centers

		Overall	Central	Northern	Western
<i>Reporting Requirement</i>	<b>Customer Counts<sup>13</sup></b>	<b>144,144</b>	<b>78,113</b>	<b>23,210</b>	<b>42,821</b>
<b>Subp. 1.A.</b>	Overall SAIDI	120.54	109.34	149.07	125.51
	Normalized SAIDI	103.60	78.68	149.07	124.40
	Major Event Excluded SAIDI	16.94	30.66	0.00	1.11
<b>Subp. 1.B.</b>	Overall SAIFI	1.24	1.03	1.07	1.69
	Normalized SAIFI	1.16	0.90	1.07	1.68
	Major Event Excluded SAIFI	0.08	0.13	0.00	0.01
<b>Subp. 1.C.</b>	Overall CAIDI	97.60	105.93	139.21	74.08
	Normalized CAIDI	89.33	87.60	139.21	73.83
	Major Event Excluded CAIDI	224.78	228.80	76.00	119.56
<b>Doc. E015/ M-19-254 Order Pt. 2</b>	Overall MAIFI	3.60	3.07	2.71	5.05
	Normalized MAIFI	3.48	2.84	2.71	5.04
	Major Event Excluded MAIFI	0.12	0.23	0.00	0.01
<b>Doc. E015/ M-19-254 Order Pt. 2</b>	Overall ASAI	99.9771%	99.9792%	99.9716%	99.9761%
	Normalized ASAI	99.9803%	99.9850%	99.9716%	99.9763%
	Difference in ASAI	0.0032%	0.0058%	0.0000%	0.0002%

In 2023, there was one major event 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:

<sup>13</sup> As determined by service points.

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

As storms occur, customers can use the online app or call in to 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 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 a 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. One Major Event was excluded in 2023. See Figure 14 below.

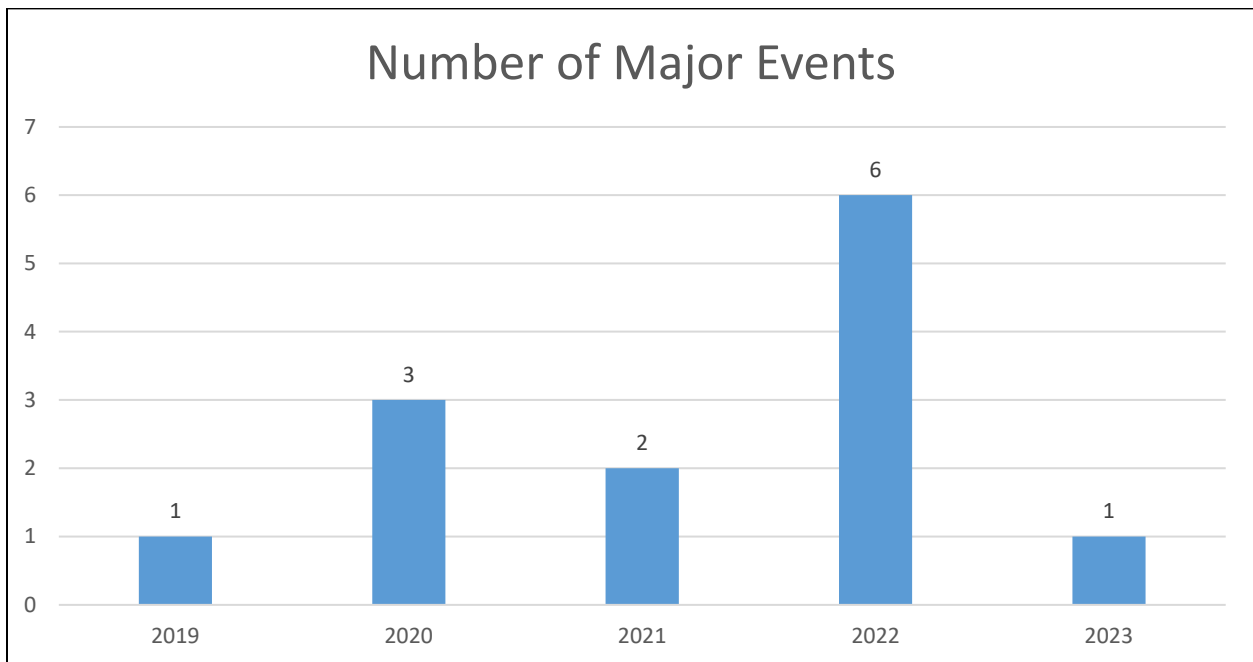


Figure 14 - Major Event Totals by Year

**2. 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 SAIDI and CAIDI but exceeded the SAIFI threshold. 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. Most of the outages throughout 2023 were attributed to overhead equipment failures, wildlife, and vegetation. The Company increased its focus on distribution equipment maintenance along with the grid modernization program 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 the fourth quarter 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 lineworkers 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. In 2023, this team took over the responsibility of all grid modernization devices across the distribution system including smart grid sensors, TripSavers, motor operated switches, reclosers, and IntelliRupters.

**3. 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 10 - List of Interruptions to Bulk Power Supply Facilities

Feeder	Date	Duration (Minutes)	Cause
23 Line (Bear Creek)	1/19/2023	43	VEGETATION
23 Line (Bear Creek)	3/26/2023	53	UNKNOWN
59 Line (Mahtowa - Sandstone)	8/15/2023	203	PLANNED MAINTENANCE

Minnesota Power has taken remedial steps to prevent future interruptions. For each interruption, the line crew patrolled the line and repaired any issues found. The interruption on January 19, 2023 occurred when winter snow weighed down a branch that made contact with and was smoking on the line. 23-Line had routine vegetation maintenance completed in 2022. The branch was removed, and power was restored. The interruption’s cause on March 26, 2023 was not found. Maintenance work was being done during the previous week, with three poles replaced around time of the outage. This maintenance work was not linked to the cause of this interruption. The interruption on

August 15, 2023 was a planned outage to replace a switch and remove three spans of static wire.

**4. 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.

**5. 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 for 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 11 - 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)	Silver Bay Townsite 4302	448	821.39	2.29	358.69
High Customer Outage Minutes (Urban)	Silver Bay Townsite 4301	625	800.62	2.02	396.35
High Feeder SAIDI (Rural)	Big Rock 272	9	1092.11	4.33	252.22
High Customer Outage Minutes (Rural)	Ridgeview 253	3048	185.33	2.01	92.20

Weather, equipment failures, and public vehicle accidents were the leading causes of these feeders' poor performance. Silver Bay Townsite 4301 and 4302 were affected by upstream substation equipment failures. In early April 2023, a substation breaker failed in the Silver Bay Hillside substation. A damaged arrestor tripped the feeders again two days later. The Silver Bay Hillside Substation was near the end of life. A new substation has been built to replace it and was energized in May 2023.

Big Rock 272 had faults in its underground cable and related equipment that affected its nine customers. These issues were repaired, and other planned maintenance continued throughout the year.

Ridgeview 253 had multiple events throughout 2023. This feeder was impacted by the major event storm on April 20, 2023, a car broke a 3-phase pole, and a few other issues with failed overhead equipment added to the poor performance of the feeder. All these issues were repaired promptly. Additional plans are in progress to split this feeder into two separate feeders, to install IntelliRupters, and conduct routine vegetation management beginning in 2024.

Table 12 - 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)	Hoyt Lakes 2	836	755.42	1.08	699.46
High Customer Outage Minutes (Urban)	Hoyt Lakes 2	836	755.42	1.08	699.46
High Feeder SAIDI (Rural)	ST. Croix 2	530	705.8	1.5	470.53
High Customer Outage Minutes (Rural)	ST. Croix 2	530	705.8	1.5	470.53

Equipment failures and public vehicle accidents were the leading causes of these feeders' poor performance. Hoyt Lakes 2 experienced a significant outage in June 2023 when an overhead wire connection, substation breaker and switch experienced failures when attempting to restore power. All these components have been repaired or replaced. This event reinforced the importance of our PM programs. Additionally, plans are in progress to add reclosers, TripSavers and some strategic undergrounding for the customers in Hoyt Lakes. St. Croix 2 had two poles struck by a public vehicle along with a bad insulator contributing to larger events.

Table 13 - 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)	Fort Ripley 1	82	439.74	7.83	56.16
High Customer Outage Minutes (Urban)	Little Falls South 1	932	176.13	2.35	74.95
High Feeder SAIDI (Rural)	Riverton 530	51	840.49	3.59	234.12

High Customer Outage Minutes (Rural)	Little Falls 529	1635	218.17	2.58	84.56
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Weather, equipment failures, and planned outages were the leading causes of these feeders' poor performance. Little Falls 529 and Little Falls South 1 were both affected by wildlife causing an outage that resulted in burnt conductors along with a failed arrestor that created additional outages. Fort Ripley was impacted by weather events and planned maintenance tied to a voltage upgrade which accumulated outage times tied to the replacement of transformers, insulators, and associated equipment. Riverton 530 encountered weather and equipment failures.

**6. 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 17 reported instances of ANSI voltage violations in 2023, which were caused by overhead and underground equipment.

Table 14 - Reported Instances of ANSI Voltage Violations 2023

Date	Cause	Voltages		
		Line to Ground	Line to Ground	Line to Line
1/4/2023	Underground Equipment	33	203	236
1/14/2023	Overhead Equipment	122	122	145
1/30/2023	Overhead Equipment	38	122	40
2/27/2023	Underground Equipment	150	277	277
5/10/2023	Underground Equipment	10	120	130
5/16/2023	Overhead Equipment	12	120	132
5/24/2023	Planned Maintenance	190	190	190
6/2/2023	Overhead Equipment	120	74	190
6/16/2023	Underground Equipment	120	50	200
6/24/2023	Overhead Equipment	120	20	140
7/6/2023	Overhead Equipment	160	110	243
8/31/2023	Overhead Equipment	155	155	290
9/6/2023	Underground Equipment	120	120	109
10/30/2023	Public Dig in	120	80	200
11/30/2023	Underground Equipment	77	118	16
12/22/2023	Overhead Equipment	134	134	279
12/28/2023	Overhead Equipment	122	46	168

**7. 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 SRSQ filing, Minnesota Power reported as one Work Center and only provided the total numbers for Distribution System Line Operations Field Workers and Contractors. 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 Center<sup>14</sup> 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 workers who provide construction, maintenance, and trouble response on the distribution system. This group includes lineworkers, 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

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<sup>14</sup> The Central work center customer count is largest at over 78,100, in comparison to the Northern work center which is over 23,200 and the Western work center at about 42,800.

Minnesota Power's entire service territory and cannot be grouped into individual work centers.

Table 15 - Employees by Work Center

2023 Support	Central	Northern	Western
<b>Line Operations Field Workers</b>	Line – 48 Sub – 8	Line – 25 Sub – 8	Line – 31 Sub – 5
<b>Line Operations Support</b>	OPS – 1 Line – 7 Fleet – 10 Sub – 2 Inv – 6	OPS – 1 Line – 2 Fleet – 3 Sub – 1 Inv – 2	OPS – 1 Line – 2 Fleet – 3 Inv – 3
	Service Dispatch – 8 System Operations – 21 Vegetation Management – 3		
<b>Engineering Support</b>	Dist – 22 Meter – 16 GIS – 9	Dist – 8 Meter – 1 GIS – 1	Dist – 10 Meter – 5 GIS – 1
	Relay – 8 Transmission – 7 Substation – 17		
<b>Contractors</b>	Line – 52 Groundline – 10 Vegetation – 80		

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

**CEMI**

Table 16 - Percentage of Customers Experiencing Multiple Interruptions by Work Center

2023	Overall		Central		Northern		Western	
	Storm Included	Storm Excluded	Storm Included	Storm Excluded	Storm Included	Storm Excluded	Storm Included	Storm Excluded
6+	0.06%	0.00%	0.00%	0.00%	0.00%	0.00%	0.21%	0.21%
5+	0.31%	0.00%	0.00%	0.00%	0.00%	0.00%	1.05%	1.05%
4+	1.59%	0.18%	0.34%	0.34%	0.02%	0.02%	4.74%	4.62%
3+	4.56%	1.82%	4.72%	3.35%	2.92%	2.92%	5.16%	5.28%

The highest CEMI feeder for overall outage data within the Central Work Center was Big Rock 272 with 4.33 outages, within the Northern Work Center was OHV Park 1 with 4.00 outages, and within the Western Work Center was Fort Ripley 1 with 7.83 outages.

## **CELI**

Table 17 - Percentage of Customers Experiencing Long Outage Durations by Work Center

2023	Overall		Central		Northern		Western	
	Storm Included	Storm Excluded	Storm Included	Storm Excluded	Storm Included	Storm Excluded	Storm Included	Storm Excluded
6 hr.	3930	2353	2936	1359	865	865	129	129
%	2.73%	1.63%	3.76%	1.74%	3.73%	3.73%	0.30%	0.30%
12 hr.	906	867	40	1	852	852	14	14
%	0.63%	0.60%	0.05%	0.00%	3.67%	3.67%	0.03%	0.03%
24 hr.	14	14	3	3	7	7	4	4
%	0.01%	0.01%	0.00%	0.00%	0.03%	0.03%	0.01%	0.01%

Within the Central Work Center, the longest customer outage duration was 5,353 minutes. This outage affected two customers, the line crew found a pole was cut down and the neutral wire had been stolen. A new pole was installed, and the wire replaced before restoring the outage.

Within the Northern Work Center, the longest customer outage duration was 6,360 minutes. This outage affected one customer when a structure fire burned down the secondary wires and damaged the service point on the adjacent customer's property. This was also the longest outage duration for Overall Company.

Within the Western Work Center, the longest customer outage duration was 2,965 minutes. This outage affected one customer when a customer was clearing snow with a skid steer and hit the meter and service point.

Table 18 - Reliability Performance by Customer Class

Customer Class Reliability		ASAI	SAIDI	SAIFI	CAIDI	MAIFI
Residential	Non-normalized	99.98058%	102.08	1.05	97.60	3.05
	Normalized	99.98331%	87.73	0.98	89.33	2.94
Commercial*	Non-normalized	99.99659%	17.92	0.18	97.60	0.54
	Normalized	99.99707%	15.40	0.17	89.33	0.52
Industrial*	Non-normalized	99.99994%	0.33	0.00	97.60	0.01
	Normalized	99.99995%	0.28	0.00	89.33	0.01

\*Commercial and Industrial customers that are fed from the Companies' distribution system.

ASAI can be thought of as uptime. For example, for the Company's Industrial customers, normalized data, they had power on average 525,599.72 minutes out of 525,600 minutes in the year, missing only 16.8 seconds during the year.

### **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 including: Within -90 minutes to 0 of estimated restoration time, within 0 to +30 minutes of estimated restoration time.

Table 19 - Estimated Time of Restoration Accuracy

2023 ETRs used	Total	Less than -91 minutes	-90 to 0 minutes	0 to +30 minutes	Above +31 minutes	-90 to 0 & 0 to 30
Initial #	10169	669	590	453	8457	1043
Initial %	100 %	6.58%	5.80%	4.45%	83.16%	<b>10.26%</b>
Final #	10169	0	0	8308	1861	8308
Final %	100%	0.00%	0.00%	81.70%	18.30%	<b>81.70%</b>

Table 19 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. Final ETRs increased estimates in the desired range from 10.26% to 81.70%

## 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 20 provides an overview of the Company's meter equipment and its deployment across the Minnesota Power distribution system. Metering technology has been thoughtfully deployed as technological advancements have become available and/or end of life is reached on existing infrastructure. For example, MV90 and AMI devices provide automated meter reading. AMI installations, which have two-way communications and other expanded functionality, began in 2009 and were completed in 2023. As such, reporting statistics regarding meters read by utility personnel includes reads obtained through these technologies which did not require manual reads. Generally, manual reads are only required in instances where the meter signal is challenged by location or environmental factors, where consecutive estimates have occurred, or occasions when a residential customer opts out of AMI. In 2023, Minnesota Power, with Commission approval, transitioned to a formal AMI opt-out process for residential customers that includes a monthly fee to read and maintain the meter.



Table 20 - Meter Equipment and Percentage Deployed

Equipment	Percent in Use <sup>15</sup>	Description
Mechanical Meters	0.04%	Traditional electro-mechanical meter that records kWh usage.
AMR – Mechanical Hybrid	0.0%	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	99.74%	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	0.22%	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 2023, Minnesota Power read an average of 99.92 percent of residential meters, 99.90 percent of commercial meters, 99.90 percent of industrial, 99.97 percent municipal pumping, and 99.94 percent lighting meters.

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<sup>15</sup> As of 1/1/2024.

Table 21 - Residential Meter Reads – Utility 2023

Month	Company Reads	Est	Total	% Read
Jan-23	144,632	126	144,758	99.91%
Feb-23	119,370	96	119,466	99.92%
Mar-23	131,692	98	131,790	99.93%
Apr-23	131,987	117	132,104	99.91%
May-23	132,867	94	132,961	99.93%
Jun-23	133,103	109	133,212	99.92%
Jul-23	132,489	120	132,609	99.91%
Aug-23	133,321	112	133,433	99.92%
Sep-23	132,402	91	132,493	99.93%
Oct-23	132,158	101	132,259	99.92%
Nov-23	132,614	71	132,685	99.95%
Dec-23	144,362	65	144,427	99.95%
<b>Average</b>	<b>133,416</b>	<b>100</b>	<b>133,516</b>	<b>99.92%</b>

In 2023, Minnesota Power read an average of 99.90 percent of commercial meters.

Table 22 - Commercial Meter Reads – Utility 2023

Month	Company Reads	Est	Total	% Read
Jan-23	23,889	24	23,913	99.90%
Feb-23	20,304	15	20,319	99.93%
Mar-23	22,587	16	22,603	99.93%
Apr-23	22,403	20	22,423	99.91%
May-23	22,372	18	22,390	99.92%
Jun-23	22,368	24	22,392	99.89%
Jul-23	22,520	23	22,543	99.90%
Aug-23	22,386	25	22,411	99.89%
Sep-23	22,475	26	22,501	99.88%
Oct-23	22,441	30	22,471	99.87%
Nov-23	22,545	26	22,571	99.88%
Dec-23	24,115	30	24,145	99.88%
<b>Average</b>	<b>22,534</b>	<b>23</b>	<b>22,557</b>	<b>99.90%</b>

In 2023, Minnesota Power read an average of 99.90 percent of industrial meters.

Table 23 - Industrial Meter Reads – Utility 2023

Month	Company Reads	Est	Total	% Read
Jan-23	341	0	341	100.00%
Feb-23	467	0	467	100.00%
Mar-23	489	0	489	100.00%
Apr-23	478	0	478	100.00%
May-23	502	0	502	100.00%
Jun-23	484	0	484	100.00%
Jul-23	516	0	516	100.00%
Aug-23	492	1	493	99.80%
Sep-23	483	1	484	99.79%
Oct-23	544	1	545	99.82%
Nov-23	468	2	470	99.57%
Dec-23	501	1	502	99.80%
<b>Average</b>	<b>480</b>	<b>1</b>	<b>481</b>	<b>99.90%</b>

In 2023, Minnesota Power read an average of 99.97 percent of municipal meters.

Table 24 - Municipal Meter Reads – Utility 2023

Month	Company Reads	Est	Total	% Read
Jan-23	269	0	269	100.00%
Feb-23	221	0	221	100.00%
Mar-23	316	0	316	100.00%
Apr-23	285	0	285	100.00%
May-23	278	0	278	100.00%
Jun-23	275	0	275	100.00%
Jul-23	277	0	277	100.00%
Aug-23	282	0	282	100.00%
Sep-23	282	1	283	99.65%
Oct-23	282	0	282	100.00%
Nov-23	288	0	288	100.00%
Dec-23	283	0	283	100.00%
<b>Average</b>	<b>278</b>	<b>0</b>	<b>278</b>	<b>99.97%</b>

In 2023, Minnesota Power read an average of 99.94 percent of lighting meters.

Table 25 - Lighting Meter Reads – Utility 2023

Month	Company Reads	Est	Total	% Read
Jan-23	392	0	392	100.00%
Feb-23	347	0	347	100.00%
Mar-23	374	1	375	99.73%
Apr-23	378	0	378	100.00%
May-23	376	0	376	100.00%
Jun-23	372	0	372	100.00%
Jul-23	375	0	375	100.00%
Aug-23	373	0	373	100.00%
Sep-23	378	0	378	100.00%
Oct-23	387	0	387	100.00%
Nov-23	381	1	382	99.74%
Dec-23	416	1	417	99.76%
<b>Average</b>	<b>379</b>	<b>0</b>	<b>379</b>	<b>99.94%</b>

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

Residential customer reads averaged 0.00 percent of the system total in 2023, of those Minnesota Power received an average of 100 percent of reads. In 2023, Minnesota Power ended support for residential customer self-reads. These meters will be read by Company personnel as part of the residential AMI opt-out process moving forward.

Table 26 - Residential Meter Reads - Self-Read 2023

Month	Cust Reads	Est	Total	% Read
Jan-23	2	0	2	100%
Feb-23	2	0	2	100%
Mar-23	1	0	1	100%
Apr-23	1	0	1	100%
May-23	1	0	1	100%
Jun-23	1	0	1	100%
Jul-23	1	0	1	100%
Aug-23	1	0	1	100%
Sep-23	0	0	0	100%
Oct-23	0	0	0	100%
Nov-23	0	0	0	100%
Dec-23	0	0	0	100%

Commercial customer reads averaged 0.01 percent of the system total in 2023, of those Minnesota Power received an average of 100.00 percent of reads.

Table 27 - Commercial Meter Reads – Self-read 2023

Month	Cust Reads	Est	Total	% Read
Jan-23	2	0	2	100.00%
Feb-23	2	0	2	100.00%
Mar-23	2	0	2	100.00%
Apr-23	4	0	4	100.00%
May-23	1	0	1	100.00%
Jun-23	1	0	1	100.00%
Jul-23	1	0	1	100.00%
Aug-23	1	0	1	100.00%
Sep-23	1	0	1	100.00%
Oct-23	0	0	0	100.00%
Nov-23	0	0	0	100.00%
Dec-23	0	0	0	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 28 - Meters Not Read 6-12 Months 2023

Months Estimated	Company Read Service Points	% of Total	Not Read Reason	Customer Read Service Points	% of Total
6 Months	0	0.000%		0	0.000%
7 Months	0	0.000%		0	0.000%
8 Months	2	0.001%	No Access/AMR	0	0.000%
9 Months	1	0.001%	No Access/AMR	0	0.000%
10 Months	2	0.001%	No Access/AMR	0	0.000%
11 Months	1	0.001%	No Access/AMR	0	0.000%
12 Months	0	0.000%		0	0.000%
12+Months	0	0.000%		0	0.000%
<b>Totals:</b>	<b>6</b>	<b>0.000%</b>		<b>0</b>	<b>0.000%</b>

Minnesota Rule 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 premises and/or are sent reminder letters of the utility’s need to access the meter. A similar process has been used for customer-read meters not read for over twelve months. In both cases phone calls are made to customers to schedule meter readings. 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**

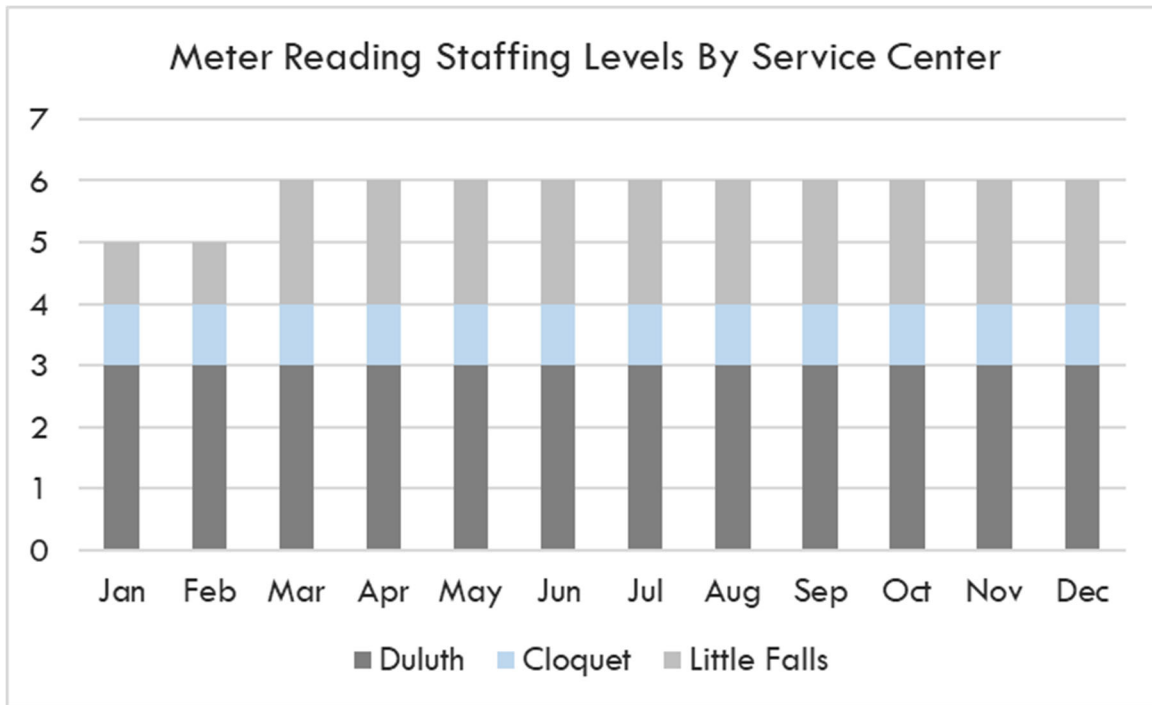


Figure 15 - Meter-reading Staffing Levels by Service Center

## 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. The Company regularly surveys a sample of 800 adults that reflects the census demographics of its residential customer base. Rapp Strategies, Inc. manages the survey contract, with Morris Leatherman LLC providing fieldwork and quality assurance of the data. In four surveys over the last decade, Minnesota Power has asked residential customers about a series of objectives for a utility to achieve, requesting a score for each objective on a scale of 1 to 10. Reliability has ranked at the top of each of these surveys, with safety, affordability, and access to backup power also appearing in the top three at various times, as shown in Figure 16.<sup>16</sup> Residential customers value other objectives, including clean power, energy efficiency, commitment to community and the benefits of green energy jobs, but 24-7 reliability of service consistently ranks the top. The Company is pleased that more than 85 percent of residential customers give positive marks for overall customer service and response to power outages. 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).

The most recent survey work examined programs and services in three ways. First, it tested satisfaction with basic service needs; 88 percent of customers gave Minnesota Power's customer service a positive rating with 28 percent providing a rating of "excellent." In the area of response to power outages, 89 percent gave a positive rating with 23 percent providing a rating of "excellent." Finally, customers were asked about the overall value they receive from Minnesota Power. Using a ten-point scale, with ten being most positive, customers gave Minnesota Power a rating of 8.14 for the following statement: "Considering the price I pay and the quality of service I receive, the electricity from Minnesota Power is an excellent value."

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<sup>16</sup> *Minn. Power Residential Customer Survey – Reputation*, RAPP STRATEGIES (2023).

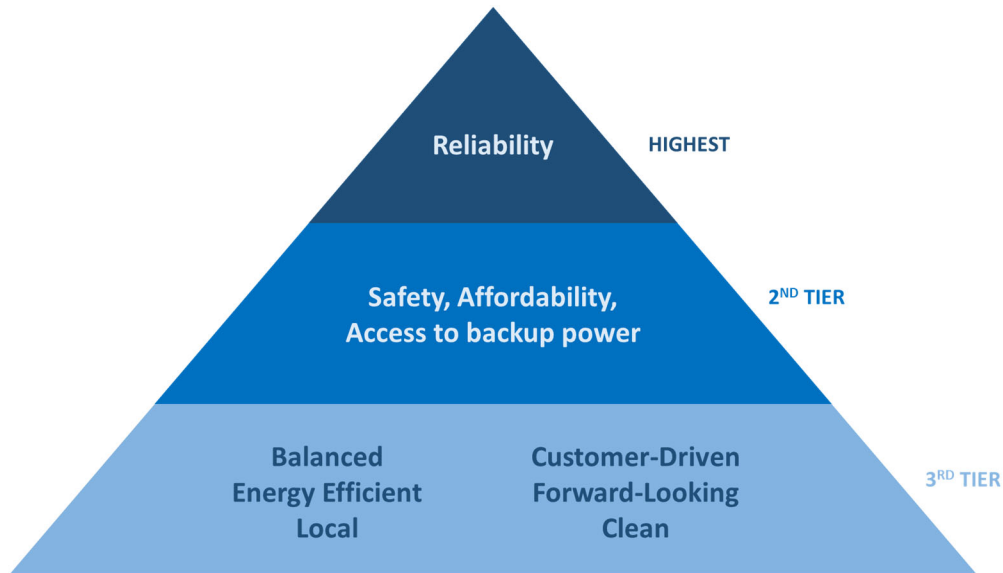


Figure 16 - Qualities Residential Customers Desire in a Utility

### 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 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 technological 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

Customer expectations and preferences regarding communication channels have evolved in recent years affecting the types of calls the Call Center receives and challenging traditional response metrics such as Call Center response times.

The most recent customer survey identified that approximately 40 percent of customers engage with the Minnesota Power website and approximately 31 percent utilize the Minnesota Power app. Among the customers that use these communication and engagement channels, there was a very high level of satisfaction with over 97 percent rating them good or excellent, and most were utilizing the platforms to engage in billing, payment, and outage reporting and monitoring. These digital platforms are important for customers to access their bill, make payments, review energy use, and to report and monitor outage communications.

Table 29 below summarizes 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 and app installations; and yearly total number of emails received, as determined by the Customer Service email address, and related tracking tool. The Company has added LinkedIn to the communications metrics as well. Instagram has added followers due to increased posting and app popularity. The Company has also been posting regularly on Facebook and has utilized boosted campaigns, increasing the total number of engaged users. Web site visits are down from 2022, but that is likely due to increased users on other channels and decreased weather and outage events in 2023. The website is often a source of information for safety and storm preparedness.

Table 29 - Customer Communication Data for 2023

2023 Electronic Customer Communications		
Website	1,667,700	Website Pageviews
MyAccount	814,675	Self Service Logins
Mobile App	8,162	App Installations
Facebook	26,510	Daily page engaged users
Instagram	2,181	Daily page engaged users
LinkedIn	14,000	Fans & Followers across networks

Table 30 reflects the monthly and 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, payment plan and marketing wrap codes for email, but these were nominal (less than 100) in 2023. Please note that the total number of emails and the number of wrap codes do not reconcile, as multiple representatives may handle an email, and each would choose a wrap code according to their role in addressing the customer inquiry. 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.

Table 30 - Total Number of Emails Received by Month 2023

Emails	
January	1,297
February	1,400
March	1,778
April	1,894
May	2,389
June	1,992
July	776
August	990
September	961
October	1,007
November	1,281
December	1,300
<b>Total:</b>	<b>17,065</b>

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

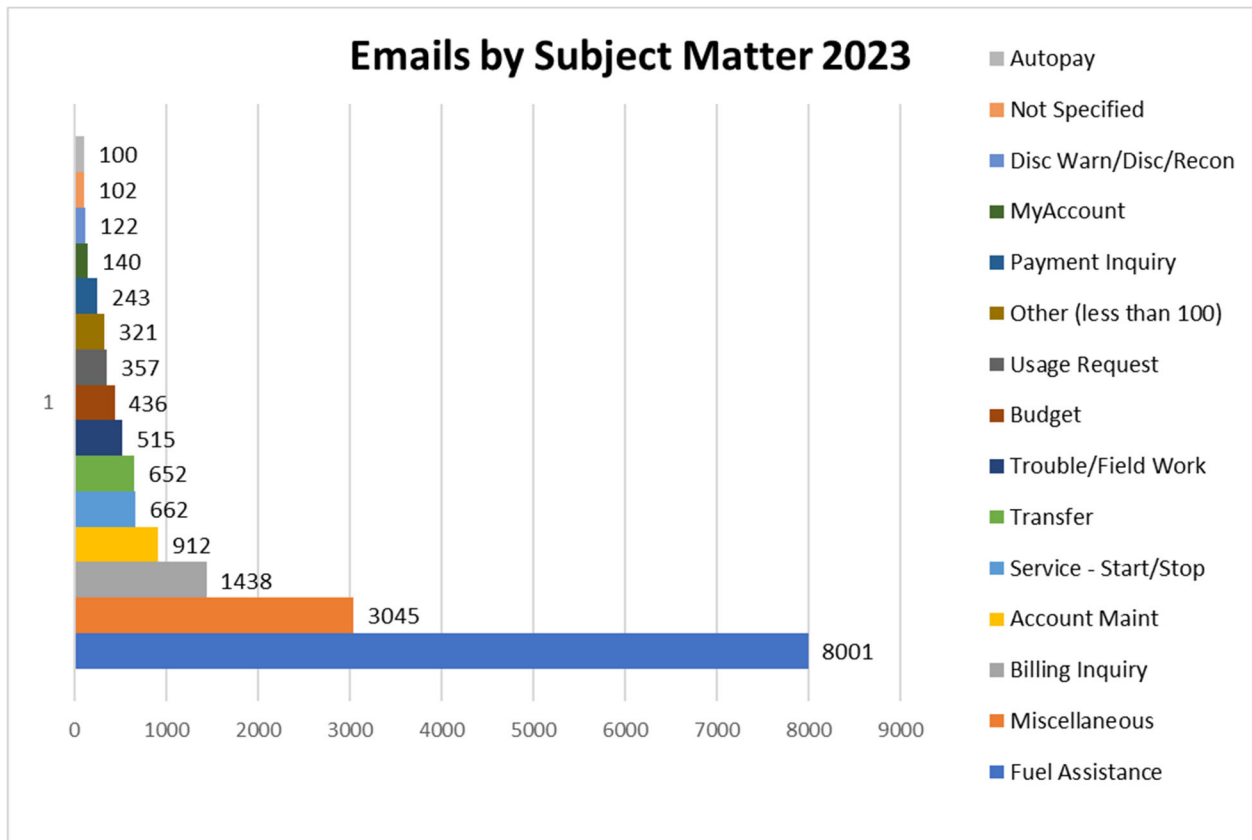


Figure 17 - Email Wrap Codes

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

Table 31 - Percent Uptime on MNPower.com, Outage Reporting, & Outage Map

2023 MNPower.com Outage Details			
Site	Uptime	Downtime (minutes)	# Outages Causing Downtime
MNPower.com	99.95%	260	109
Outage Reporting Form	100.00%	18	17
Outage Map	100.00%	0	0

Table 32 - Percent Uptime on Online Payment Service through Speedpay.com

2023 Uptime on Speedpay.com				
	Extranet	Internet	API	IVR
AVG:	0.9995	0.9996	99.96%	0.9997

Table 33 - Percent Uptime on MyAccount

2023 MyAccount Uptime & Outage Detail		
Uptime	# of Outages	Total Minutes
99.99%	3	11

## **Service Quality Performance Reporting**

The information required to be reported under Minnesota Rules 7826.1400 through 7826.2000 is provided on the following pages.

### **A. Reporting Involuntary Disconnections: Minnesota Rule 7826.1500**

While great strides were made in reducing past due balances that have built up since 2020, the aggregate total remains well-above pre-pandemic levels, largely due to protections that have spanned three Cold Weather Rule protection seasons. Calendar year 2023 represents the first full year where standard collections processes completely resumed since protections were put in place in 2020 and available energy assistance dollars for residential customers reverted to more typical pre-pandemic levels. Notably, residential customers typically represent around 80-85 percent of arrears balances. At the end of 2023, approximately 64 percent of past due amounts for residential customers were less than \$200 and over 90 percent were less than \$500. In 2023, the Company saw an increase in the number of disconnections, but also had an increase in the number of Cold Weather Rule protections requested and granted, an increase in payment plans, and nearly two-thirds of residential customers that were disconnected were reconnected within 24 hours with well over half of those using remote-capable technology. Details regarding residential customers, past due balances, protections, and related information are filed monthly as part of the Residential Customer Status Report under Docket No. E,G-999/PR-YR-2.

**Number of customers who received disconnection notices.**

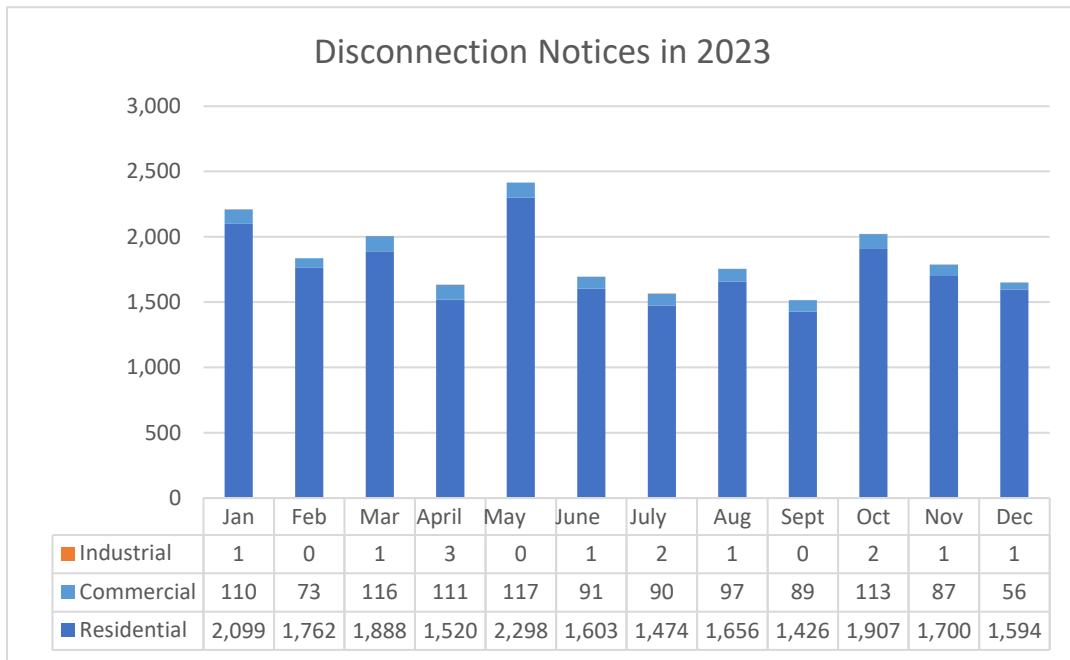


Figure 18 - Disconnection Notices 2023

Table 34 - Disconnection Notices in 2023

Total Disconnection Notices in 2023		
Residential	Commercial	Industrial
20,927	1,150	13

**1. Number of customers who sought Cold Weather Rule (CWR) protection under Chapter 7820 and the number who were granted Cold Weather Rule protection**

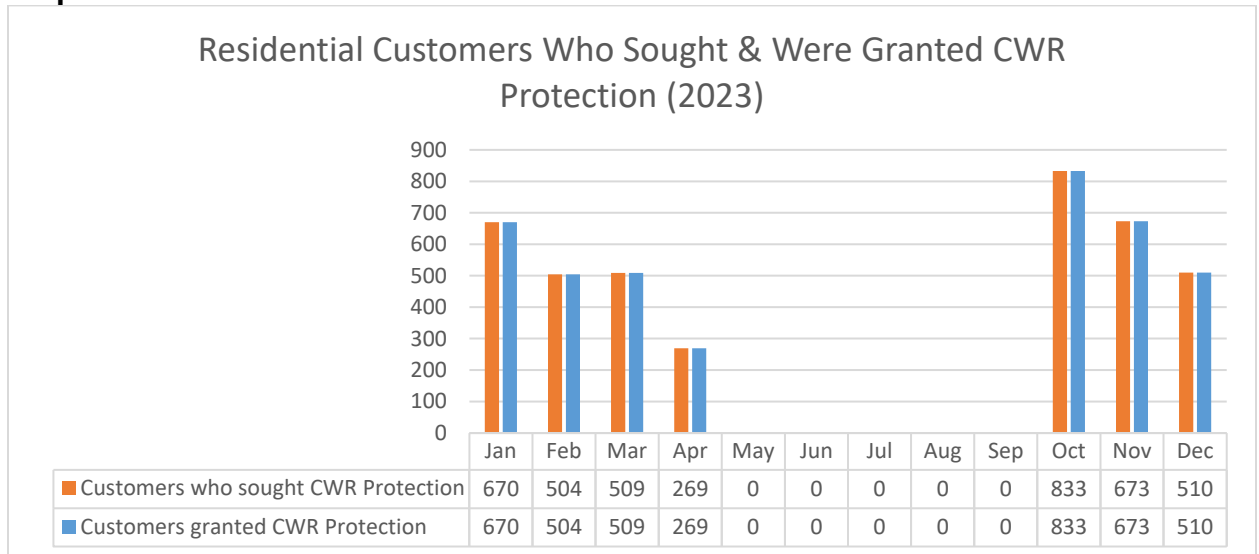


Figure 19 - Customers Who Sought and were Granted CWR Protection 2023

Table 35 - Total Customers Who Sought & Were Granted CWR Protection

Total Residential Customers Who Sought CWR Protection	Total Residential Customers Granted CWR Protection
3,968	3,968

Minnesota Power granted Cold Weather Rule protection to 100 percent of customers who requested protection.

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

Figure 20 - Residential Customers Disconnected Involuntarily & Restored w/in 24 Hours

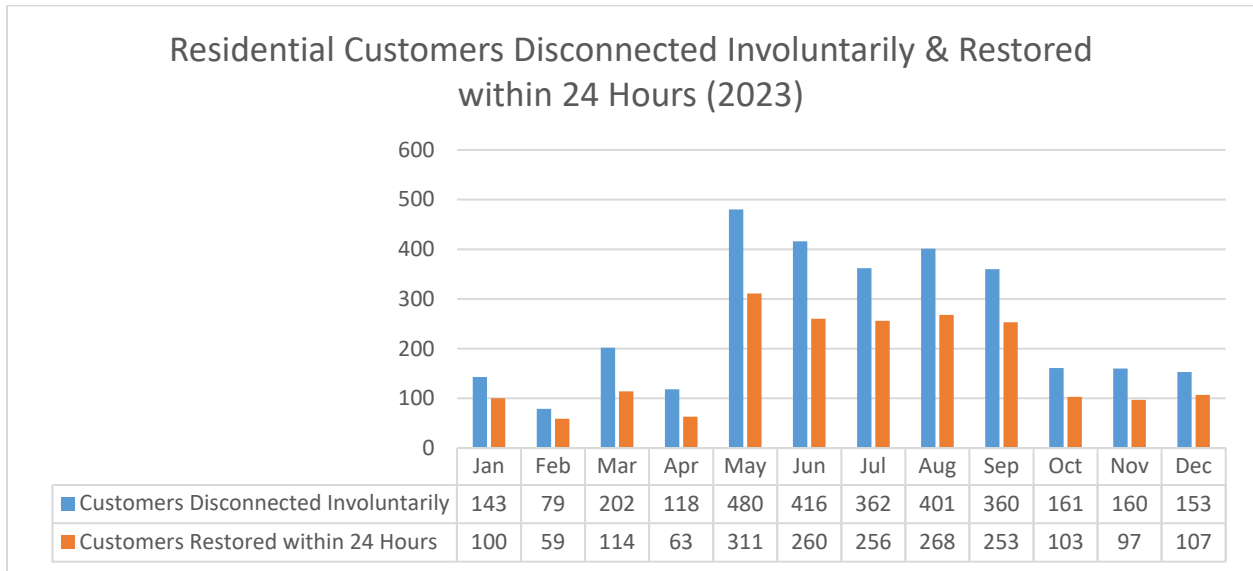


Figure 21 - Commercial Customers Disconnected Involuntarily & Restored w/in 24 Hours

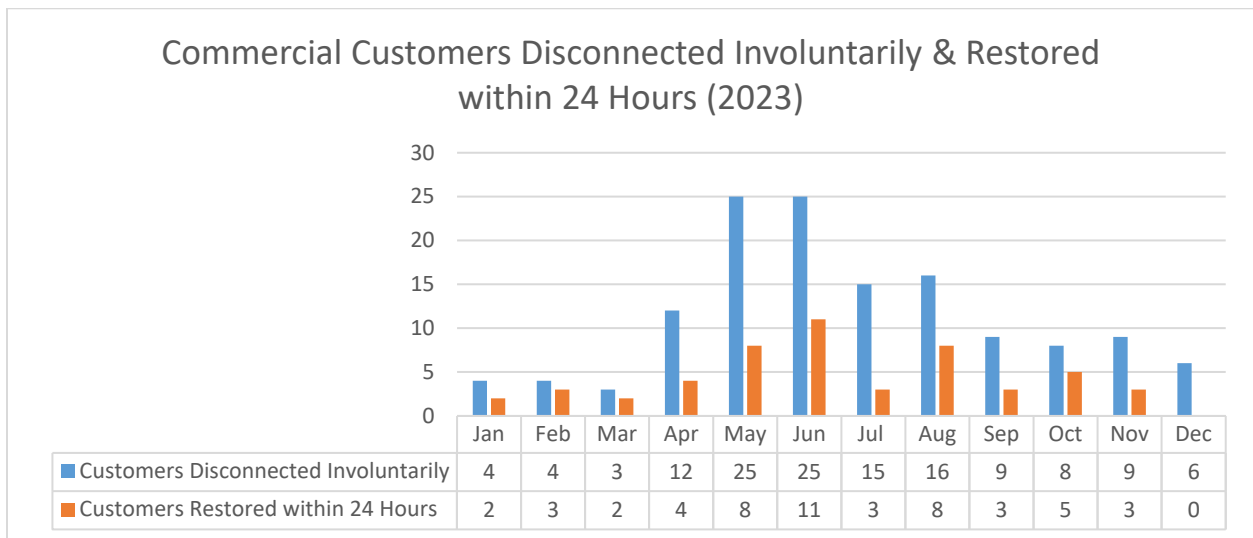




Table 36 - Total Customers Disconnected Involuntarily and Restored w/in 24 hours in 2023

Total Customers Disconnected Involuntarily			Total Customers Restored within 24 Hours		
Residential	Commercial	Industrial	Residential	Commercial	Industrial
3,035	121	0	1,991	45	0

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

Table 37 – Customers Restored via Payment Plan 2023

Month	Residential	Commercial	Industrial
Jan	104	2	0
Feb	59	3	0
Mar	122	2	0
Apr	73	5	0
May	336	8	0
Jun	284	15	0
Jul	270	5	0
Aug	288	7	0
Sep	273	3	0
Oct	99	5	0
Nov	99	3	0
Dec	104	0	0

**B. Reconnect Pilot Program**

On December 2, 2019, Minnesota Power filed a 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 timing of the approval order for this pilot, COVID-19 protections and the related Transition Plan that continued into 2022, the timing for implementation of this voluntary three-year pilot program was deferred until August 2021. Resumption of normal operations where residential customer disconnections for non-payment could occur largely began August 2, 2021; however, there was an exception in the Transition Plan for customers with past due balances who either had a pending energy assistance application or had been determined eligible for energy assistance. For customers under this exception, disconnection protections continued for the duration of the transition period, which was through April 30, 2022.

Beginning as early as August 2, 2021, residential electricity customers had the option to participate in the Reconnect Pilot Program. 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.

For any residential 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 utilizing 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.

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, 2023, there were 10,178 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 2023. There were 2,027 LIHEAP and 564 Self-Declare customers in the Remote Reconnect Pilot.

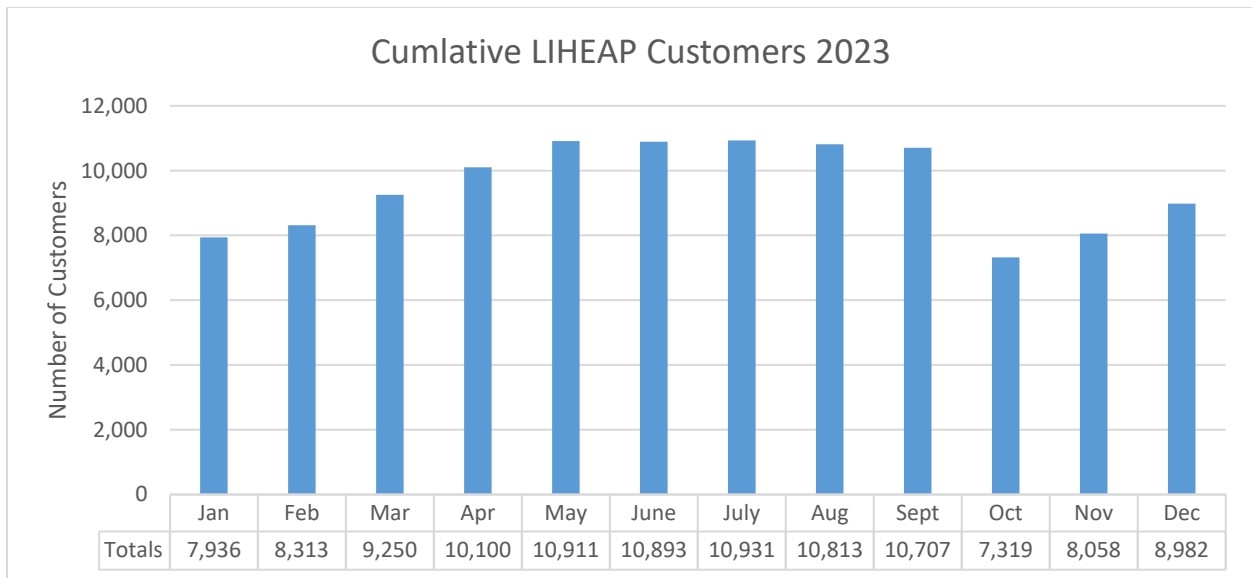


Figure 22 - Cumulative LIHEAP Customers 2023

Most customers have been receptive of AMI in general, with only a small percentage that have opted out of the technology. As AMI is the base technology and remote-capability is an added feature to AMI, opting out of AMI effectively opts a customer out of the pilot. In June 2023, the Company mailed letters to 60 residential customers who had previously expressed that they did not want an AMI meter at their property. The letter explained that, though previously there was no cost to opting out of AMI, the Company would begin charging \$20 per month in 2023 as part of a recently approved AMI opt-out provision. This fee is largely to cover the costs associated with providing and maintaining old technology. The letter gave the customers until August 2023 to respond and the opt out fee went into effect in October 2023. As of December 31, 2023, there were 42 customers

in total who have opted out of AMI. Of those opted out in 2023, five provided documentation from a medical professional stating that they must opt out for health reasons. Minnesota Power has waived the monthly opt out fee for these customers. These customers will be required to renew their health exemption on an annual basis, following a similar process to what is used for determining medical necessity.

Minnesota Power estimates the representative net cost changes specifically related to the Remote Reconnect Pilot in 2023 to be approximately \$652,000 which is an expenditure increase based on the incremental installed cost of the remote-capable meters less estimated cost-savings from remote reconnections.

Table 38 below shows the average reconnection times for both remote and non-remote-capable meters based on residential customer status as LIHEAP, Self-declare, or Standard, showing duration in days, hours, minutes, and seconds. As disconnection duration is heavily influenced by customer action, Minnesota Power also calculated this based on when the customer initiated the reconnection (i.e. from request). On-average, customers with remote-capable meters were reconnected faster than those with standard AMI. This is true under both the average time to reconnect from disconnect and average time to reconnect from customer request. Notably, LIHEAP and self-declare customers were reconnected faster overall and under both metrics, with the average time to reconnect under one minute for pilot participants from the point of request.

Table 38 - Average Reconnection Time Based on Customer Status

<b>Average Time to Reconnect from Disconnect</b>	<b>Standard</b>	<b>Remote</b>
<b>LIHEAP Customers</b>	5 Days, 4:34:44	3 Days, 7:21:56
<b>Self-Declare Customers</b>	5 Days, 5:15:35	4 Days, 1:14:57
<b>Standard Customers</b>	22 Days, 6:6:31	9 Days, 3:52:29
<b>Average Time to Reconnect from Request</b>	<b>Standard</b>	<b>Remote</b>
<b>LIHEAP Customers</b>	0 Days, 4:13:56	0 Days, 0:0:53
<b>Self-Declare Customers</b>	0 Days, 2:59:3	0 Days, 0:0:51
<b>Standard Customers</b>	0 Days, 11:54:0	0 Days, 0:9:57

Figure 23 shows the number of reconnections restored within 24 hours of disconnection, distinguishing between standard and remote reconnections.

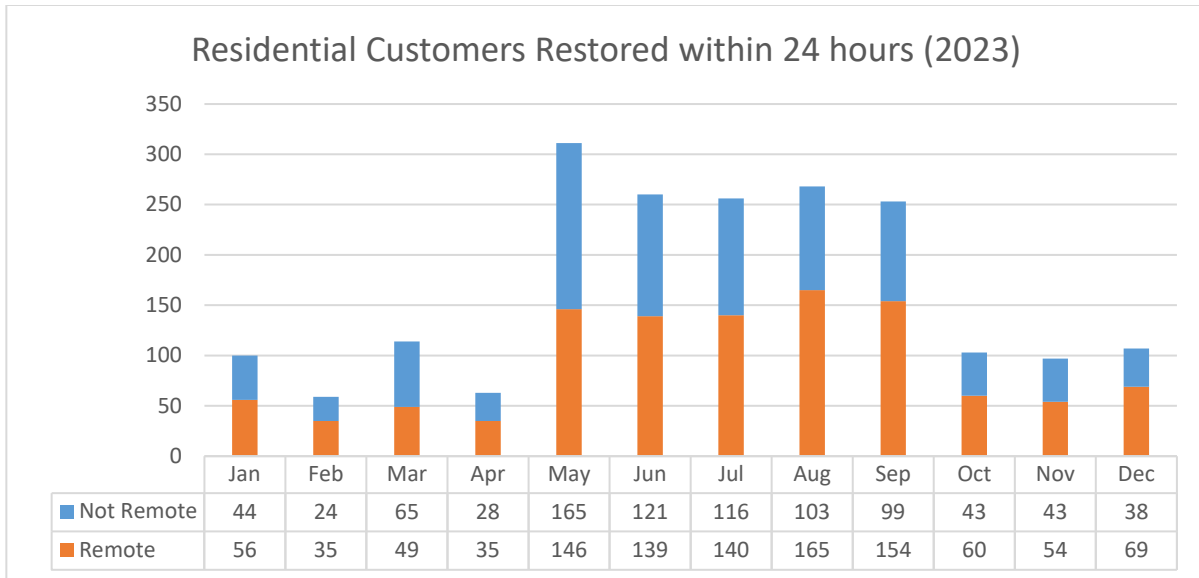


Figure 23 - Residential Customers Restored within 24 Hours

### 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 2023 to a location not previously served by Minnesota Power.

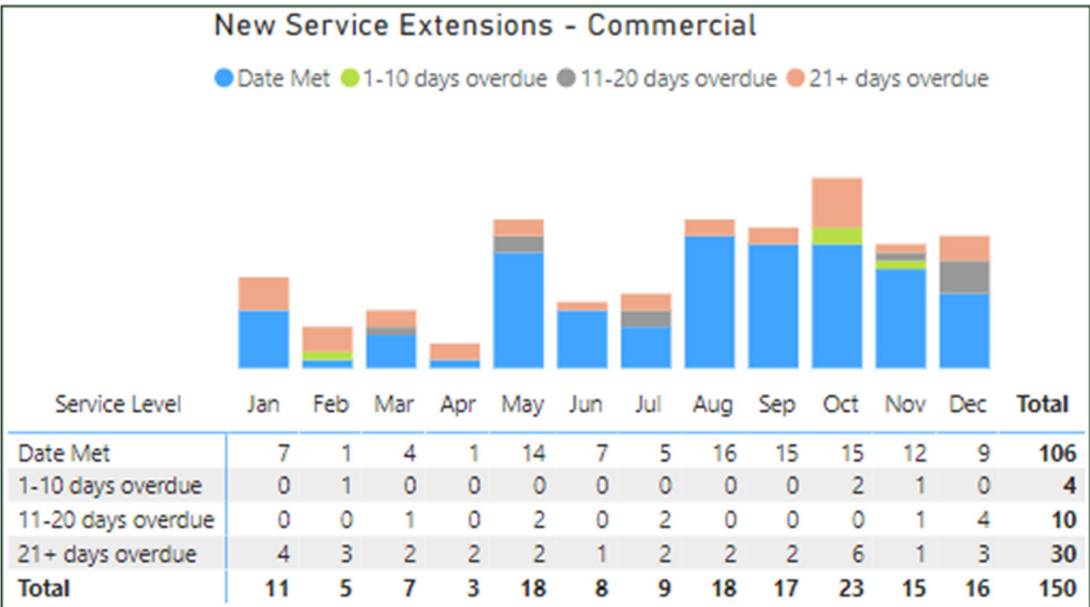


Figure 24 - New Service Extensions - Commercial 2023

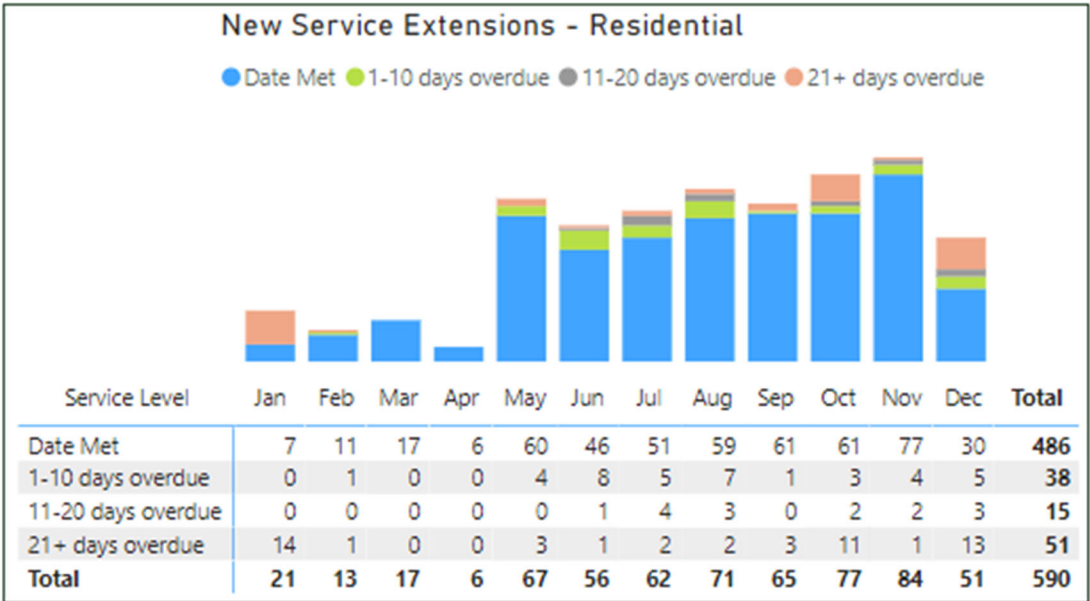


Figure 25 - New Service Extensions - Residential 2023

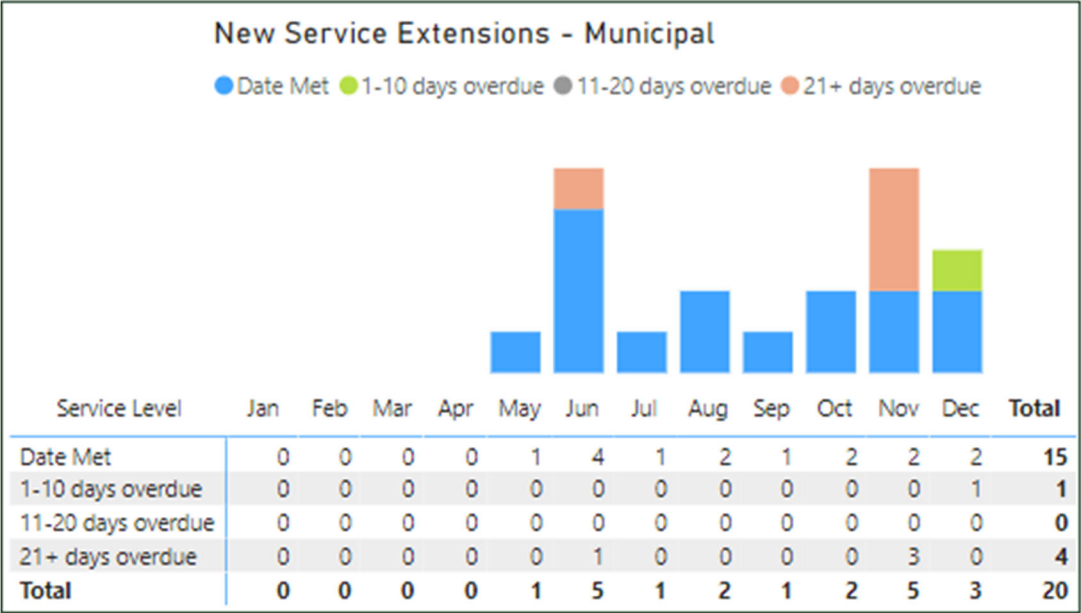


Figure 26 - New Service Extensions - Municipals 2023

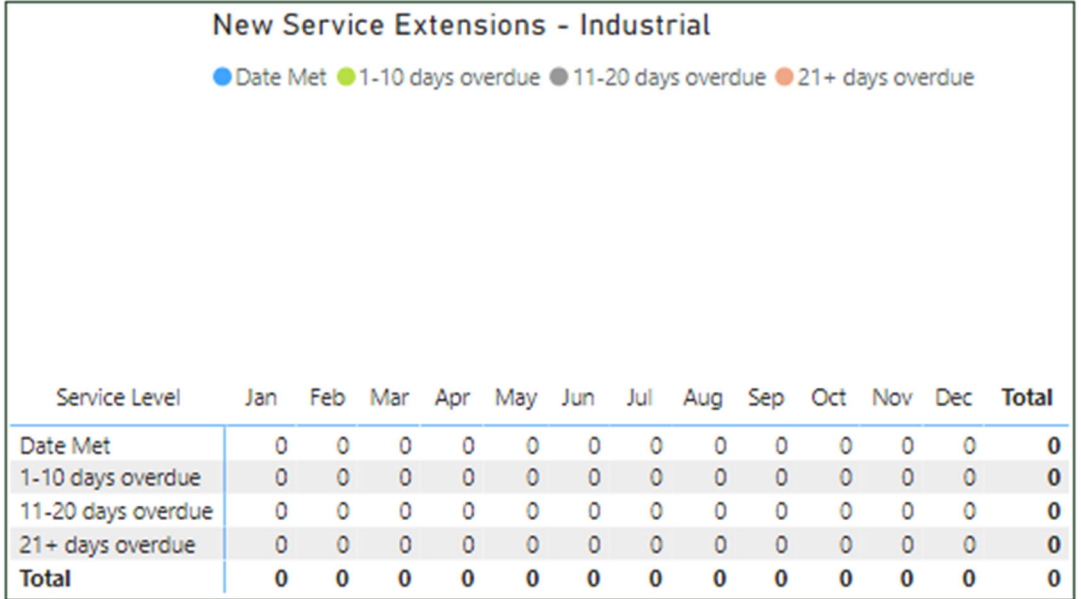


Figure 27 - New Service Extensions - Industrial 2023

Figure 28 below lists the number and percentage of New Service Extensions 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 607 of 760 customer requests (80 percent). Of the dates not met, the four largest reasons for a delay in meeting in-service date were: Customer's Contractor/Electrician Not Ready (9.21 percent), Customer Not Ready (4.87 percent), Customer Late Notification (1.97 percent), and MP Unable to Meet Date (1.97 percent).

Overall, the major challenges Minnesota Power faced were a result of customer delays. As depicted below, the "Customer's Contactor/Electrician Not Ready" was the most prevailing reason for not meeting the new construction customer requested want date. This includes increased workload for contractors and electricians and material shortages on the customer side for job completion. The reason code "Customer Not Ready" was primarily a result of customers needing to hire an electrician, construction delays, and various other customer related issues. Minnesota Power has a 21-day planned schedule. Customers are advised of this and still identify a want date which may not allow for adequate scheduling time. These are coded "Customer Late Notification." "MP Unable to Meet Date" was a result of additional coordination resulting from unplanned work, needing planned power outages, resources, and not being able to meet the date desired by the customer.



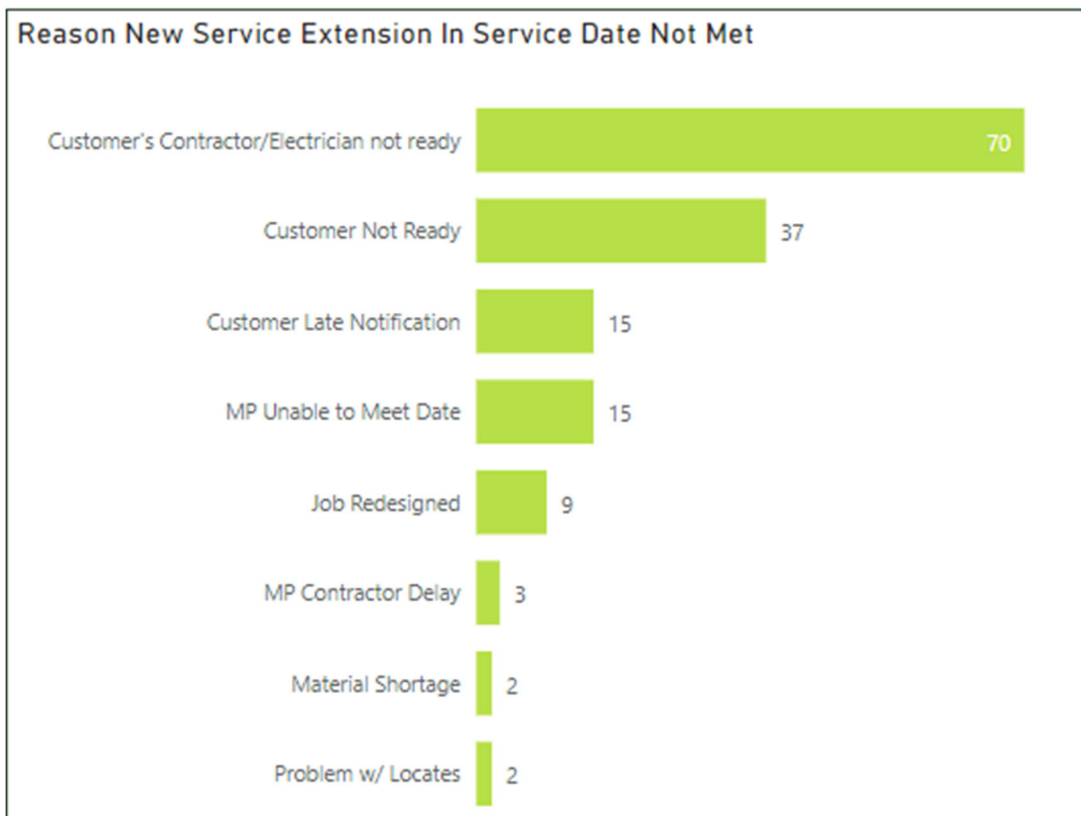


Figure 28 - New Service Extensions - Reasons Dates Not Met 2023

- 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.**

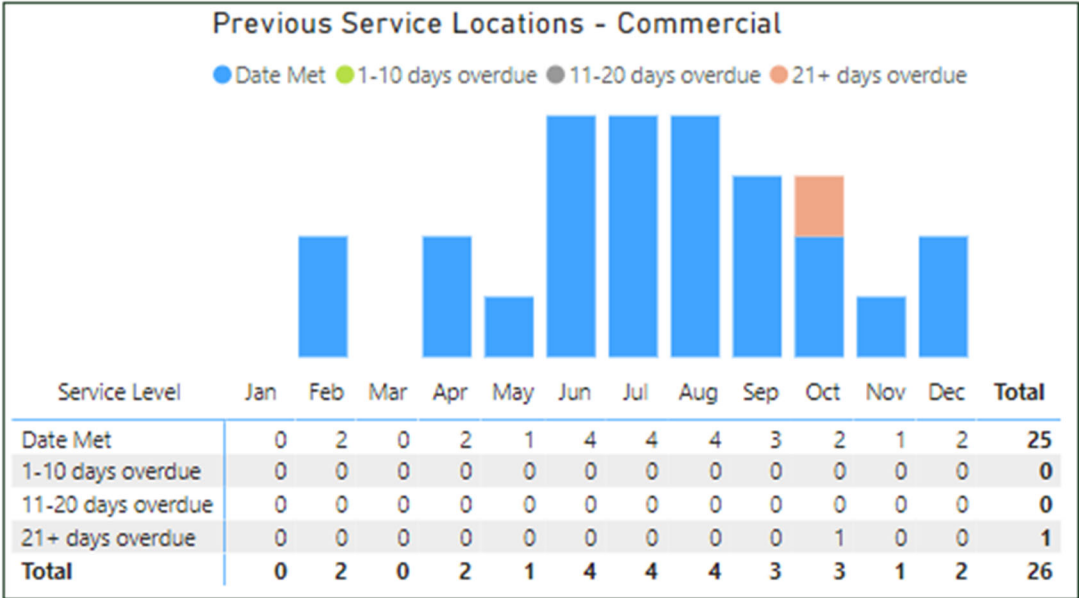


Figure 29 - Previous Locations - Commercial 2023

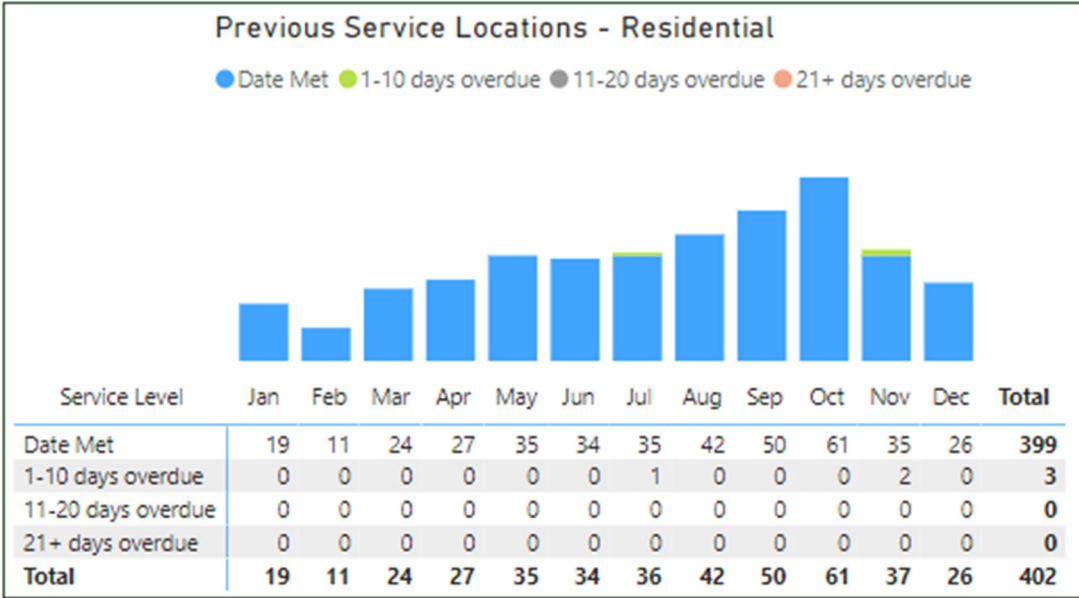


Figure 30 - Previous Service Locations - Residential 2023

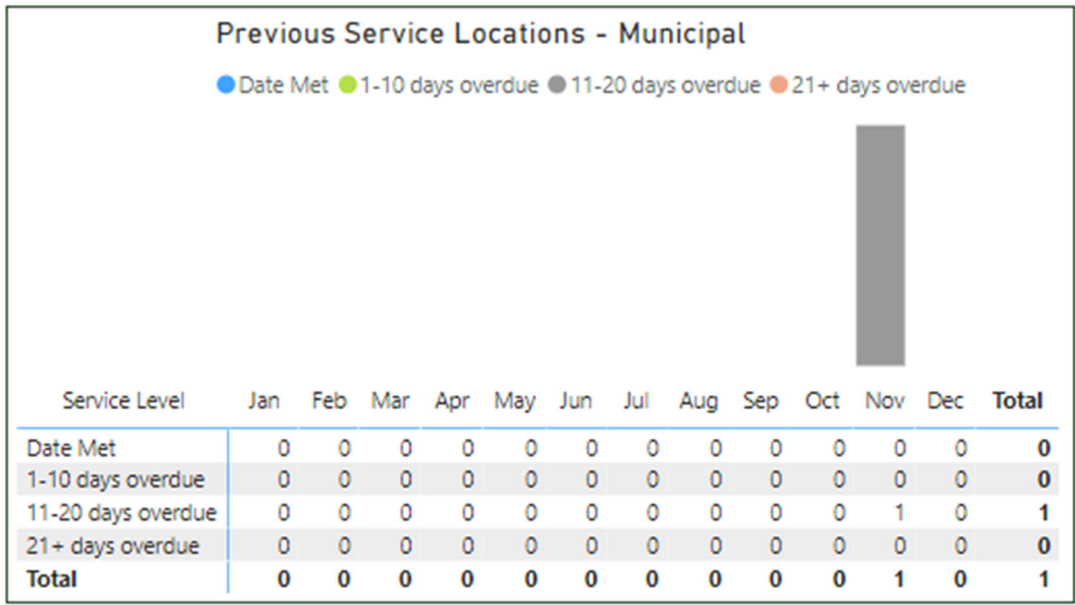


Figure 31 - Previous Service Locations - Municipal 2023

There were no industrial customers requesting service to a location previously served by Minnesota Power and only one Municipal. Figure 32 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 2023 was Customer Not Ready. This occurred when customers requested service but were not ready for service.

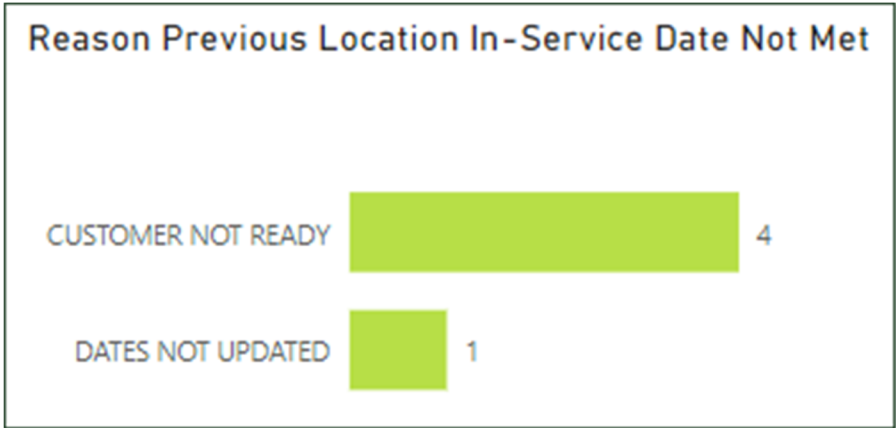


Figure 32 - Previous Service Locations - Reasons Date Not Met 2023

**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. The Company is pleased to report that, on an annual basis, 80 percent of calls offered in 2023 during business hours were answered within 20 seconds, meeting the requirement as defined in Minn. Rule 7826.1200. Overall, in 2023 Minnesota Power was able to exceed the 80% requirement during the months of February (88%), August (87%), September (85%), November (87%), and December (89%). The Company narrowly missed the requirement in the months of January (78%), March (79%), June (79%), July (77%), and October (79%). During these months, the service levels were lower primarily due to unplanned absences and the new employee onboarding and training process. Other impacts were related to company initiatives including residential rate transition, interim rate refunds, rate and fee changes, and a large customer mailing to self-declared CARE customers to ensure continuation of their program discount by qualifying for energy assistance.

During the months of April (70%) and May (69%) of 2023, two experienced, full-time Call Center representatives advanced to other positions within the Company. While these positions were ultimately filled, it was with less experienced candidates and required time for hiring, onboarding, and training. May is also a month that typically has higher call volume, primarily due to Cold Weather Rule protections ending in April, the beginning of summer collection processes, and increased calls for starting and stopping service due to the large population of college students and renters moving during this time of year.

As new employees grew in proficiency, and call volume was distributed across a more ideal staffing level, Minnesota Power was able to achieve the overall response requirement of 80% in 20 seconds during 2023. This trend has continued into 2024, with a cumulative response time of approximately 85% as of the date of this filing.

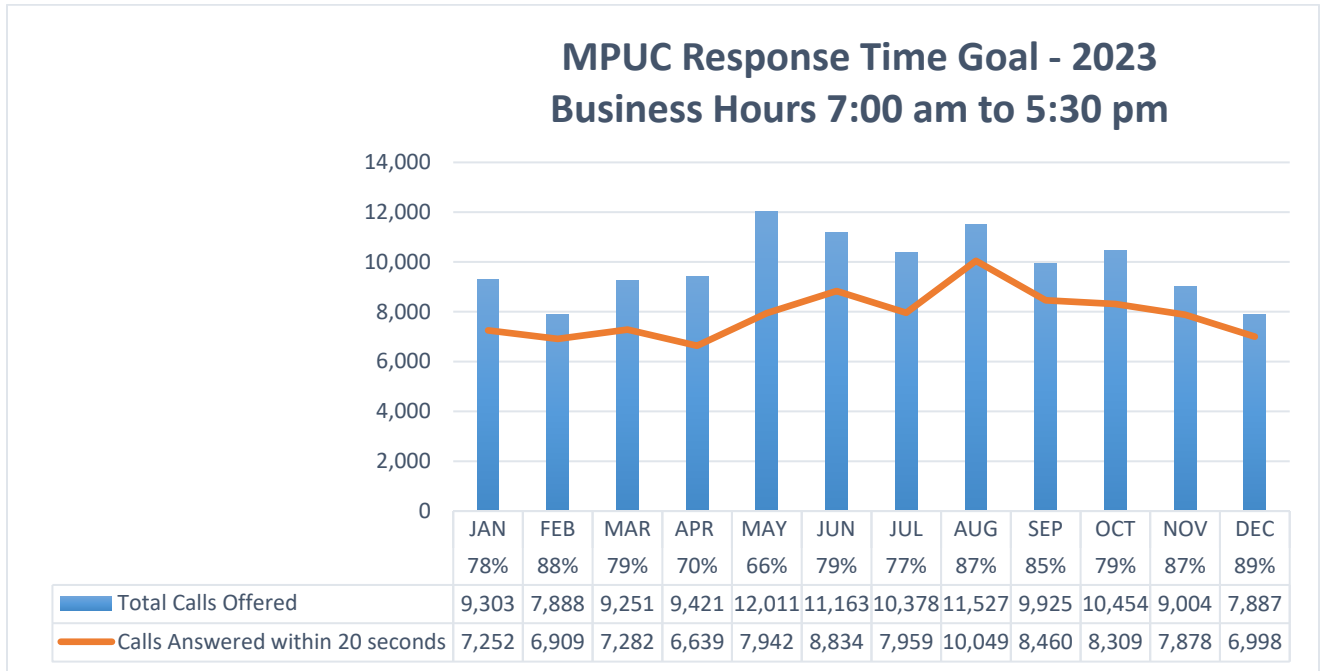


Figure 33 - Response Time - Business Hours 2023

Table 39 - Response Time - Business Hours 2023

Business Hours, 7 AM - 5:30 PM, Monday – Friday						
Month 2023	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	78%	9,303	7,252	0:00:31	0:04:24	0:06:09
Feb	88%	7,888	6,909	0:00:19	0:04:13	0:05:59
Mar	79%	9,251	7,282	0:00:30	0:04:26	0:06:14
Apr	70%	9,421	6,639	0:00:40	0:04:16	0:05:58
May	66%	12,011	7,942	0:00:48	0:04:26	0:06:10
Jun	79%	11,163	8,834	0:00:25	0:04:18	0:06:08
Jul	77%	10,378	7,959	0:00:32	0:04:24	0:06:12
Aug	87%	11,527	10,049	0:00:16	0:04:24	0:06:15
Sep	85%	9,925	8,460	0:00:18	0:04:24	0:06:15
Oct	79%	10,454	8,309	0:00:27	0:04:31	0:06:21
Nov	87%	9,004	7,878	0:00:15	0:04:11	0:06:01
Dec	89%	7,887	6,998	0:00:15	0:04:08	0:06:04
<b>YTD</b>	<b>80%</b>	<b>118,212</b>	<b>94,511</b>	<b>0:00:27</b>	<b>0:04:21</b>	<b>0:06:09</b>

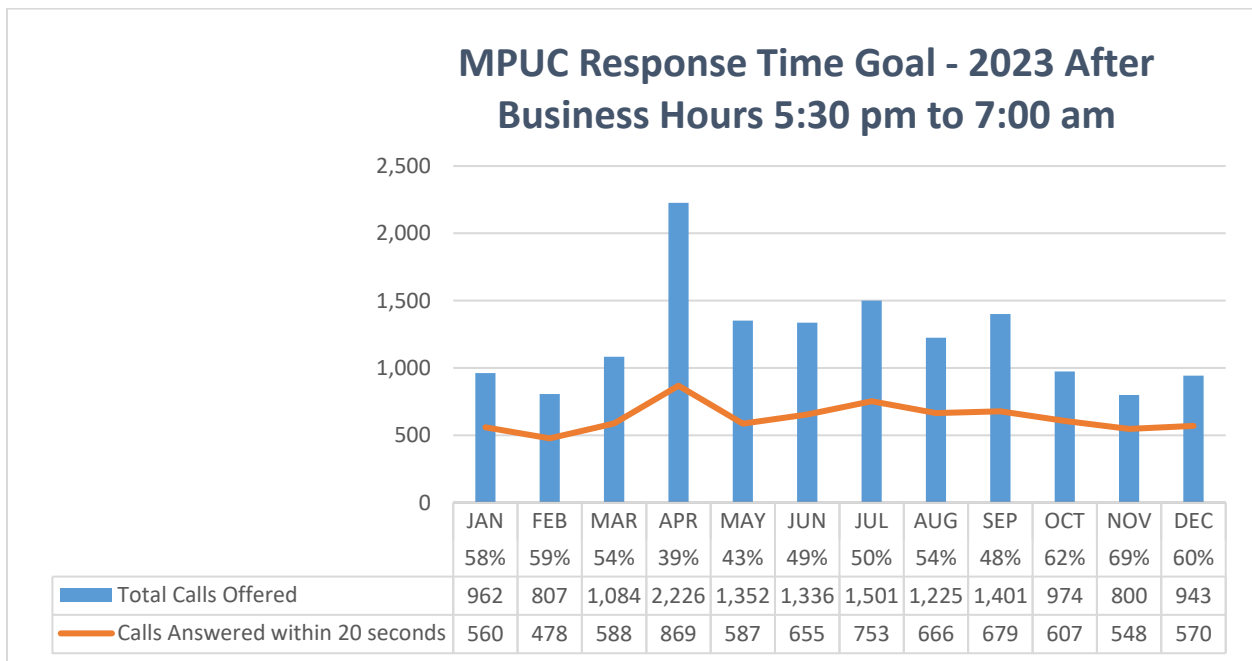


Figure 34 - Response Time - After Hours 2023

Table 40 - Response Time - After Hours 2023

After Hours 5:30 p.m. - 7:00 a.m.			
Month 2022	Response Time	Total Calls Offered	Calls Answered within 20 seconds
Jan	58%	962	560
Feb	59%	807	478
Mar	54%	1,084	588
Apr	39%	2,226	869
May	43%	1,352	587
Jun	49%	1,336	655
Jul	50%	1,501	753
Aug	54%	1,225	666
Sep	48%	1,401	679
Oct	62%	974	607
Nov	69%	800	548
Dec	60%	943	570
<b>YTD</b>	<b>52%</b>	<b>14,611</b>	<b>7,560</b>

Figure 35 provides a breakdown of calls received in 2023 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 purpose of the call 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.



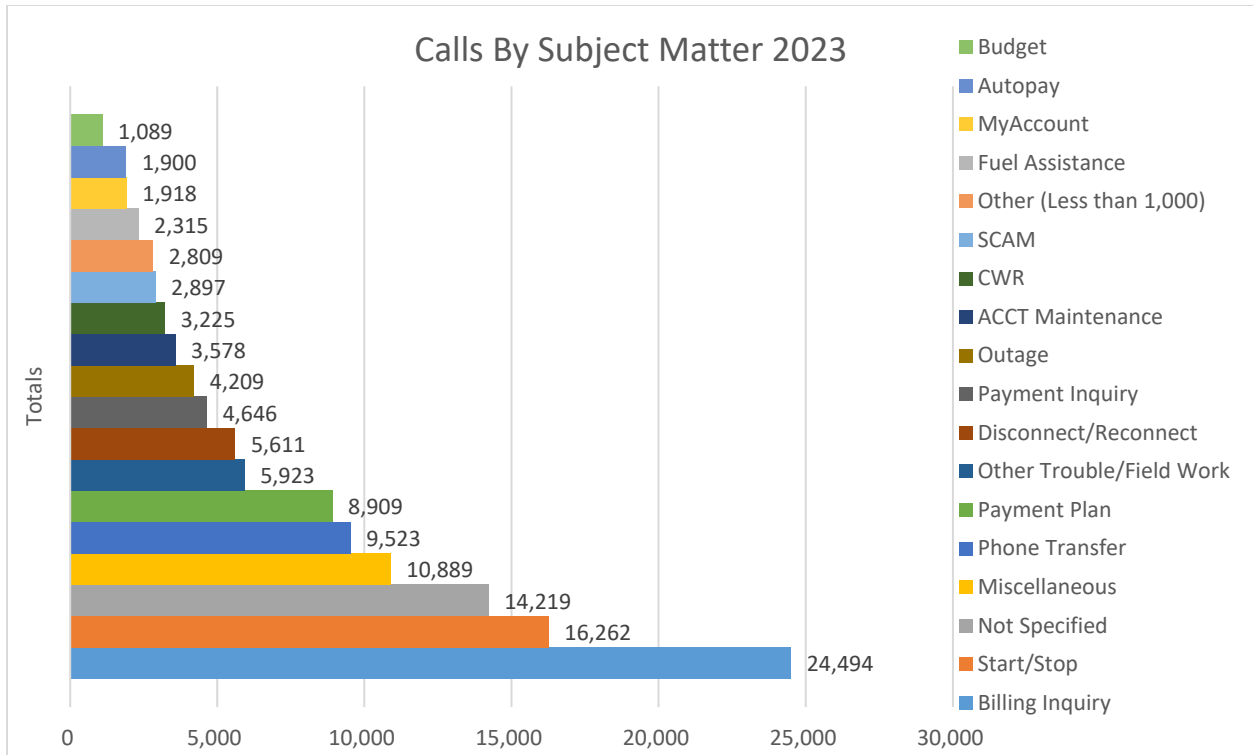


Figure 35 - Calls by Subject Matter 2023

**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 41 - Emergency Medical Account Status Count 2023

DATE	Requested	Renewed	Added	Denied
<b>Jan</b>	6	6	0	0
<b>Feb</b>	5	3	2	0
<b>Mar</b>	7	3	4	0
<b>Apr</b>	9	4	5	0
<b>May</b>	12	4	8	0
<b>Jun</b>	8	4	4	0
<b>Jul</b>	10	3	7	0
<b>Aug</b>	5	1	4	0
<b>Sep</b>	9	3	6	0
<b>Oct</b>	4	0	4	0
<b>Nov</b>	11	2	9	0
<b>Dec</b>	12	5	7	0
<b>Totals:</b>	<b>98</b>	<b>38</b>	<b>60</b>	<b>0</b>

In 2023, Minnesota Power had 98 customers request emergency medical account status. 98 requests were granted after customers provided Minnesota Power with the required signed documentation indicating need. In total with the above referenced requests and renewals, there were 182 customers noted in the system with medical account status designation. Of these, 51 were removed due to non-renewal, customer request, deceased customer, or closed account. All documentation is on file and available upon request.

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](http://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 certification expiration, 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 is generally not conducted but may be reconsidered in the future or as part of a specific electric service agreement provision for a commercial or industrial customer.

#### **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 billing system.

**1. The number of complaints received.**

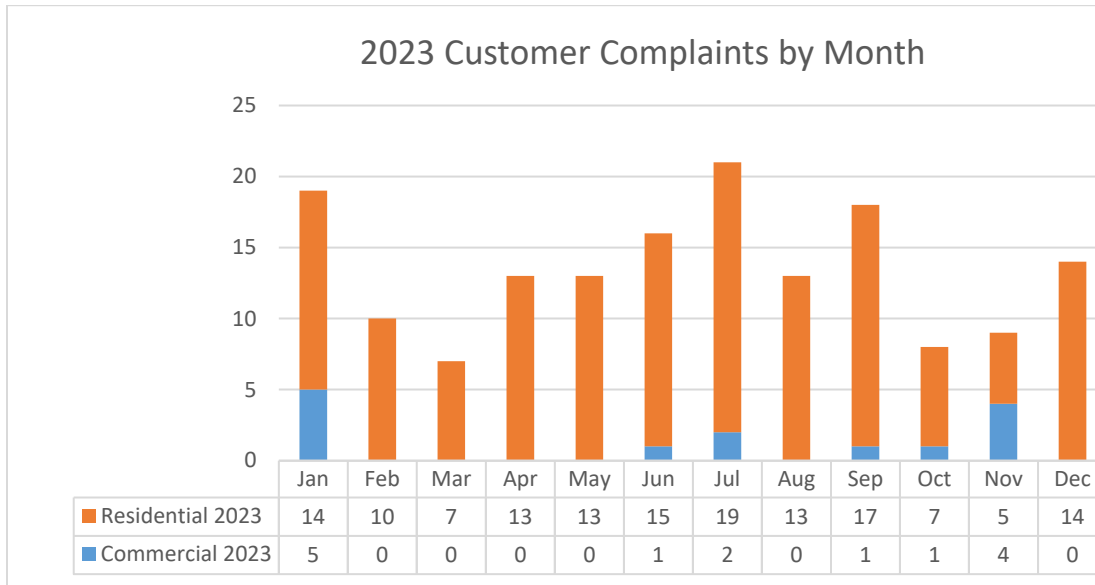


Figure 36 - Customer Complaints by Month 2023

Table 42 - Customer Complaints Totals

Customer Class	Total	% of Total
<b>Residential</b>	147	91.30%
<b>Commercial</b>	14	8.7%
<b>Total</b>	<b>161</b>	<b>100.00%</b>

**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 43 - Residential and Commercial Complaints by Type 2023

Complaint Description	Complaint Description	Customer Class	Customer												Total	% of Total
			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
Billing Error		COM	1	0	0	0	0	0	0	0	0	0	1	0	2	1.24%
Billing Error		RES	0	0	0	1	0	0	1	1	1	0	1	0	5	3.11%
High Bill Complaint		COM	4	0	0	0	0	1	2	0	1	1	3	0	12	7.45%
High Bill Complaint		RES	14	9	6	8	10	14	16	8	13	6	3	14	121	75.16%

Inadequate Service		COM	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00%
Inadequate Service	Field/Operations	RES	0	0	0	0	3	0	0	0	0	0	0	0	3	1.86%
Inadequate Service	Customer Service	RES	0	0	0	0	0	1	0	0	1	0	0	0	2	1.24%
Inadequate Service	Programs & Services	RES	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00%
Inadequate Service	CWR Protection	RES	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00%
Incorrect Metering		COM	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00%
Incorrect Metering		RES	0	0	0	0	0	0	0	1	0	0	1	0	2	1.24%
Service Restoration		RES	0	0	0	0	3	1	1	2	2	1	0	0	10	6.21%
Wrongful Disconnection		COM	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00%
Wrongful Disconnection		RES	0	1	0	0	0	0	1	1	1	0	0	0	4	2.48%
<b>Total</b>			<b>19</b>	<b>10</b>	<b>7</b>	<b>13</b>	<b>13</b>	<b>16</b>	<b>21</b>	<b>13</b>	<b>18</b>	<b>8</b>	<b>9</b>	<b>14</b>	<b>161</b>	<b>100%</b>

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

Table 44 - Timeframe of Complaints Resolved 2023

Days To Resolution	Customer Group	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total	% of Total
<b>Greater Than 10 Days</b>	Commercial	2	0	0	0	0	0	0	0	0	0	1	0	3	16.15%
	Residential	3	3	2	2	1	3	3	2	1	2	0	1	23	
<b>Less Than 10 Days</b>	Commercial	3	0	0	0	0	1	2	0	0	0	3	0	9	68.32%
	Residential	10	6	4	10	10	12	13	8	13	4	1	10	101	
<b>Same Day Resolution</b>	Commercial	0	0	0	0	0	0	0	0	1	1	0	0	2	15.53%
	Residential	1	1	1	1	2	0	3	3	3	1	4	3	23	
<b>Total</b>		<b>19</b>	<b>10</b>	<b>7</b>	<b>13</b>	<b>13</b>	<b>16</b>	<b>21</b>	<b>13</b>	<b>18</b>	<b>8</b>	<b>9</b>	<b>14</b>	<b>161</b>	<b>100.00%</b>

- 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 45 - Residential Complaints Resolved 2023

Resolution Reason	Commercial	Residential	Total	% Resolved Contacts
Compromise	3	29	32	19.88%
Customer Request	2	16	18	11.18%
No Control	8	100	108	67.08%
Refuse	1	2	3	1.86%
<b>Total</b>	<b>14</b>	<b>147</b>	<b>161</b>	<b>100.00%</b>

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

Minnesota Power had 25 complaints forwarded to the utility by the Commission’s Consumers Affairs Office for further investigation and action in 2023.

Items 6 through 8 were added to include reporting elements included under Minn. Rule 7820.0500.<sup>17</sup>

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

The categories below are merged into different complaint type categories, consistent with previous 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.

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<sup>17</sup> Customer complaint data as required under Minnesota Rule 7820.0500.

Table 46 - Complaints by Type and Customer Class

Complaint Type	Residential			Commercial/Industrial			Interruptible		
	Received	Resolved	Unresolved	Received	Resolved	Unresolved	Received	Resolved	Unresolved
Service	21	21	0	0	0	0	0	0	0
Billing	126	126	0	14	14	0	0	0	0
Rate	0	0	0	0	0	0	0	0	0
Rules	22	22	0	3	3	0	0	0	0

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

Table 47 - Number of Disconnections for Non-Payment by Customer Class by Month class

Month	Residential	Commercial/Industrial	Interruptible
Jan	143	4	0
Feb	79	4	0
Mar	202	3	0
Apr	118	12	0
May	480	25	0
Jun	416	25	0
Jul	362	15	0
Aug	401	16	0
Sep	360	9	0
Oct	161	8	0
Nov	160	9	0
Dec	153	6	0
<b>Total</b>	<b>3,035</b>	<b>136</b>	<b>0</b>

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

Table 48 - Total Number of Customers and Customers Add by Customer Class for 2023

	Residential	Commercial	Interruptible
Number of Customers (year-end)	108,387	16,150	0
Customers Added During Year	-45	-58	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 were created 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.

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. This data is included above on Table 43 Residential and Commercial Complaints by Type 2023.

- Inadequate Service – Field/Operations
  - Field work delays, property damage related to necessary work/maintenance, scheduling delays/cancellations, etc.
- Inadequate Service – Customer Service
  - Responsiveness, misapplied payments, unsatisfactory employee experience, etc.
- Inadequate Service – Programs and Services
  - Missing rebates, Energy Audit issues, EV issues, etc.



- Inadequate Service – Cold Weather Rule Protection
  - Resetting CWR payment plan, Payment amounts, etc.

### VIII. 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 2023 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 2<sup>nd</sup> quartile numbers from the 2023 IEEE reliability survey, the results of which will be published in the second half of 2024. At that time, Minnesota Power will submit a supplemental filing with the updated goals.

Table 49 - 2023 Proposed Reliability Performance Standards (These numbers will be updated to 2024 Proposed Reliability Performance Standards when IEEE numbers become available.)

	OVERALL	Central	Northern	Western
<b>SAIDI</b>	<b>143</b>	193	193	193
<b>SAIFI</b>	<b>1.11</b>	1.39	1.39	1.39
<b>CAIDI</b>	<b>134</b>	125	125	125

## IX. Conclusion

Minnesota Power respectfully submits this information on its Safety, Reliability and Service Quality metrics, demonstrating the Company's efforts and commitment to provide reliable, safe, and affordable electric service to its unique customer base. 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 99.9 percent reliable for its customers in 2023 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 several efforts to improve reliability, including strategic undergrounding, grid modernization, and asset renewal programs.

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 the increasing frequency of severe weather-related outages. Minnesota Power continues to heartily embrace new opportunities to lead the way on energy and grid transition, while also coping with supply chain challenges, staffing shortages and longer product lead times and swiftly responding to an emergence of atypical storm events.

In the midst of significant energy and distribution system transition, the Company has kept service quality at the forefront, delivering on call response time goals, advancing communications across multiple digital platforms, and working closely with customers to maintain service and affordability. Minnesota Power continues to enjoy high customer satisfaction ratings and remains a leader in adopting technology, programs, and service offerings. The Company remains committed to *EnergyForward* – 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

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Susan Romans, of the City of Duluth, County of St. Louis, State of Minnesota, says that on the 1<sup>st</sup> day of **April, 2024**, she served **Minnesota Power's 2023 Safety, Reliability and Service Quality Standards Report** on the Minnesota Public Utilities Commission and the Energy Resources Division of the Minnesota Department of Commerce via electronic filing. The persons on Minnesota Power's General Service List for its SRSQ Report (attached) were served as requested.



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Susan Romans

First Name	Last Name	Email	Company Name	Address	Delivery Method	View Trade Secret	Service List Name
Matthew	Brodin	mbrodin@allete.com	Minnesota Power Company	30 West Superior St  Duluth, MN 55802	Electronic Service	No	GEN_SL_Minnesota Power_MPs SRSQ Serv Lst
Generic Notice	Commerce Attorneys	commerce.attorneys@ag.state.mn.us	Office of the Attorney General-DOC	445 Minnesota Street Suite 1400  St. Paul, MN 55101	Electronic Service	No	GEN_SL_Minnesota Power_MPs SRSQ Serv Lst
Hillary	Creurer	hcreurer@mnpower.com	Minnesota Power	30 W Superior St  Duluth, MN 55802	Electronic Service	No	GEN_SL_Minnesota Power_MPs SRSQ Serv Lst
Sharon	Ferguson	sharon.ferguson@state.mn.us	Department of Commerce	85 7th Place E Ste 280  Saint Paul, MN 551012198	Electronic Service	No	GEN_SL_Minnesota Power_MPs SRSQ Serv Lst
Adam	Heinen	aheinen@dakotaelectric.com	Dakota Electric Association	4300 220th St W  Farmington, MN 55024	Electronic Service	No	GEN_SL_Minnesota Power_MPs SRSQ Serv Lst
Lori	Hoyum	lhoyum@mnpower.com	Minnesota Power	30 West Superior Street  Duluth, MN 55802	Electronic Service	No	GEN_SL_Minnesota Power_MPs SRSQ Serv Lst
Allen	Krug	allen.krug@xcelenergy.com	Xcel Energy	414 Nicollet Mall-7th fl  Minneapolis, MN 55401	Electronic Service	No	GEN_SL_Minnesota Power_MPs SRSQ Serv Lst
David	Moeller	dmoeller@allete.com	Minnesota Power	30 W Superior St  Duluth, MN 558022093	Electronic Service	No	GEN_SL_Minnesota Power_MPs SRSQ Serv Lst
Generic Notice	Residential Utilities Division	residential.utilities@ag.state.mn.us	Office of the Attorney General-RUD	1400 BRM Tower 445 Minnesota St St. Paul, MN 551012131	Electronic Service	No	GEN_SL_Minnesota Power_MPs SRSQ Serv Lst
Susan	Romans	sromans@allete.com	Minnesota Power	30 West Superior Street Legal Dept Duluth, MN 55802	Electronic Service	No	GEN_SL_Minnesota Power_MPs SRSQ Serv Lst

First Name	Last Name	Email	Company Name	Address	Delivery Method	View Trade Secret	Service List Name
Christine	Schwartz	Regulatory.records@xcelenergy.com	Xcel Energy	414 Nicollet Mall FL 7 Minneapolis, MN 554011993	Electronic Service	No	GEN_SL_Minnesota Power_MPs SRSQ Serv Lst
Will	Seuffert	Will.Seuffert@state.mn.us	Public Utilities Commission	121 7th Pl E Ste 350 Saint Paul, MN 55101	Electronic Service	No	GEN_SL_Minnesota Power_MPs SRSQ Serv Lst