AN ALLETE COMPANY

30 West Superior Street
Duluth, MN 55802-2093
www.mnpower.com

Jenna Warmuth
Senior Public Policy Advisor
218-355-3448
jwarmuth@mnpower.com

April 1, 2020

VIA ELECTRONIC 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 2020 Safety, Reliability and Service Quality Standards Report Docket No. ____

Dear Mr. Seuffert:

Minnesota Power herby submits its annual Safety, Reliability and Service Quality Standards Report to the Minnesota Public Utilities Commission ("Commission"). In this year's Safety, Reliability and Service Quality Report, Minnesota Power outlines how the Company continuously strives to provide excellent service to all customers across a unique service territory in northeastern and central Minnesota.

The Company appreciates the Commission's attention to this matter and is available to answer any questions related to the modifications.

Please contact me at the number above with any questions related to this matter.

Respectfully,

Jenna Warmuth

JMW:th
Attach.

STATE OF MINNESOTA	)	AFFIDAVIT OF SERVICE VIA
	) ss	ELECTRONIC FILING
COUNTY OF ST. LOUIS	)	

Tiana Heger of the City of Duluth, County of St. Louis, State of Minnesota, says that on the 1st day of April, 2020, she served Minnesota Power's 2020 Safety, Reliability and Service Quality Standards Initial Filing on the Minnesota Public Utilities Commission and the Energy Resources Division of the Minnesota Department of Commerce via electronic filing. The persons on E-Docket's Official Service List for this Docket were served as requested.

Tiana Heger

Safety, Reliability and Service Quality Standards Report in Accordance With Minn. Rule 7826

Docket No. E-999/R-01-1671

Minnesota Power

4/1/2020

Introduction

Serving over 145,000 residential and commercial electric customers across northeastern and central Minnesota, Minnesota Power's distribution system is comprised of 5,800 miles of distribution lines and 201 distribution substations ("distribution system"). Minnesota Power'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 below. Ensuring safe, reliable, and affordable service to our diverse customers throughout our region is our priority, and Minnesota Power is committed and taking concrete actions to improve on the reliability metrics described in this report.

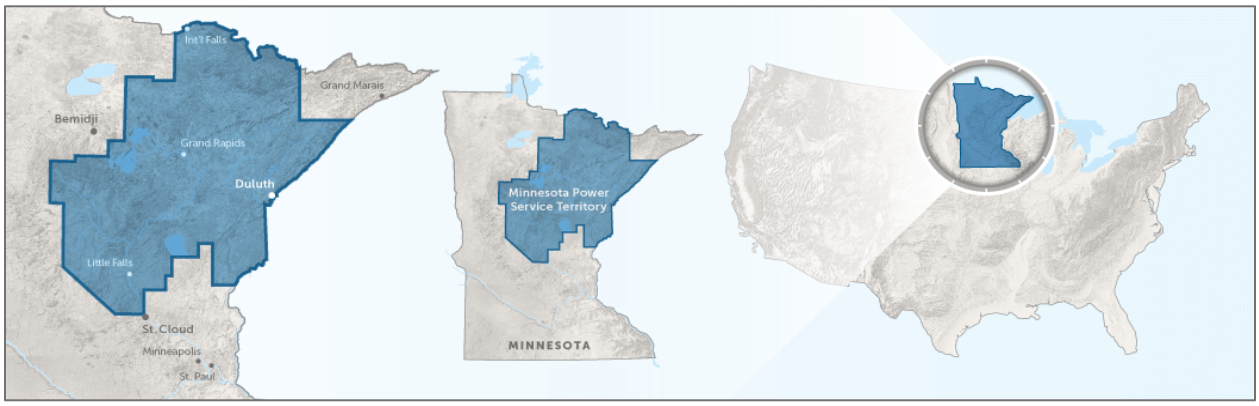

Figure 1: Minnesota Power's Service Territory

Minnesota Power's residential customers are served directly from the distribution system. Interactions with these customers include items such as: planning for new construction, service extensions, outage restoration, system upgrades and responding to a wide variety of other electric service and rate questions. Residential customers comprise roughly twelve percent of the Company's annual retail electric sales. However, since most of Minnesota Power's customer sales are served via transmission-level voltage, residential customers comprise a relatively large portion of Minnesota Power's distribution system load. Consequently, while residential customers comprise a small portion of the Company's overall load and revenue, they are a relatively large part of the distribution system, and an important part of Minnesota Power's business. Additionally, much of Minnesota Power's service territory 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 radial feeder will have different challenges and requirements than someone located in a more populated area with feeder redundancy.

Minnesota Power's commercial customers account for approximately fourteen percent of regulated retail electric sales revenue and are also served directly from the distribution system. A wide range of interactions occur with commercial customers including planning for new construction, service extensions, outage restoration, reliability and power quality concerns, system upgrades, and responding to a variety of other electric service and rate questions. These customers are a diverse group with varying needs and expectations depending on the business (i.e., electric costs as a percentage of total operating/production costs, power quality and reliability needs, etc.). Reliability is of 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. Customer businesses consisting of office workers may no longer have access to computers or phones and productivity drops, while retailers may lose the ability to

conduct business resulting in lost revenue. For those customers with sensitive loads and technology related businesses, power quality and even momentary outages may be a significant issue.

In order to meet the needs of this diverse customer base, Minnesota Power built its distribution strategy upon the core values of technology, innovation, and continuous learning. Customers expect reliable, safe, and affordable electric service, all of which are encompassed in these core distribution values. 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, and upholding its distribution values.

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2019 Safety, Reliability, and Service Quality Report

I. Introduction & Background

In accordance with Minn. Rule 7826 - ELECTRIC UTILITY STANDARDS, and additional Commission Orders, Minnesota Power submits its fifteenth annual Safety, Reliability and Service Quality Report. Prior orders from the Commission have required Minnesota Power to respond in this filing with additional information not delineated in the administrative rules. For administrative ease, a separate appendix has been provided to specifically respond to the administrative rules which apply to this Report.

Organization of Filing

Minnesota Power respectfully submits this report on its safety, reliability and service quality for 2019 and its corresponding reliability results. This report 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:

- Introduction & Background
- 2019 Year in Review
- 5-Year Rolling Average Metric and EEI Benchmarking
- Colbyville 240 Feeder
- 2019 Summary Graphs
- Reliability Cost Matrix
- System Construction and Protection

Minnesota Power submits the following information:

A. Name, Address, and Telephone Number of Utility
(Minn. Rules 7825.3500 (A) and 7829, subp. 3 (A))

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

B. Name, Address, and Telephone Number of Utility Attorney
(Minn. Rules 7825.3500 (A) & 7829, subp. 3 (B))

David R. Moeller, Senior Attorney and Director of Regulatory Compliance
Minnesota Power
30 West Superior Street
Duluth, MN 55802
(218) 723-3963
dmoeller@allete.com (e-mail)

C. Date of Filing and Date Proposed Rates Take Effect
This petition is being filed on April 1, 2020. Until MPUC approval, the existing reliability results will remain in effect.

D. Statute Controlling Schedule for Processing the Petition

This petition is made pursuant to Minnesota Rules 7826.0400, 7826.0500, 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.

E. Utility Employee Responsible for Filing

Jenna Warmuth
Senior Public Policy Advisor
30 West Superior Street Duluth, MN 55802
(218) 355-3448
jwarmuth@mnpower.com (e-mail)

F. 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:

David R. Moeller	Jenna Warmuth
Senior Attorney	Senior Public Policy Advisor
Minnesota Power	Minnesota Power
30 West Superior	30 West Superior Street
Duluth, MN 55802	Duluth, MN 55802
(218) 723-3963	(218) 355-3448
dmoeller@allete.com	jwarmuth@mnpower.com

G. 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.

H. Filing Summary

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

Compliance Requirements

SUMMARY OF FILING REQUESTS

Based on information provided throughout this filing, Minnesota Power requests the following:

From the MPUC:

- Acceptance of its Report and proposed reliability results for the year 2020.

PROCEDURE AND AUTHORITY

Minnesota Power is submitting this petition in accordance with Minn. Rules 7826.0400, 7826.0500, 7826.0500, 7826.0600, subp. 1, and 7826.1300 and in compliance with MPUC rules and orders relating to annual filings associated with Minnesota Power's Safety, Reliability, Service Quality and proposed reliability results.

This petition constitutes a Miscellaneous Filing as that term is defined in Minn. Rules Chapter 7829 which identifies the time frame and procedures required to process this petition.

II. 2019 Year in Review

The Company failed to meet its 2019 storm excluded goals for System Average Interruption Duration Index ("SAIDI") by 45.83 minutes, for System Average Interruption Frequency Index ("SAIFI") by 0.33 and Customer Average Interruption Duration Index ("CAIDI") by 10.06. As shown in Figure 2 below, the Company experienced its second highest number of outage events in the last decade in 2019 (2016 was the highest and 2018 was the third highest). The number of outage events in 2019 was more than 25 percent higher than the historical average. Out of more than 5,100 unique events, 108 major events contributed more than 56 percent of overall SAIDI. The Company is experiencing a greater number of significant weather events which do not rise to the level of the storm exclusion rule threshold. These non-excluded weather events account for the majority of the Company's SAIDI minutes

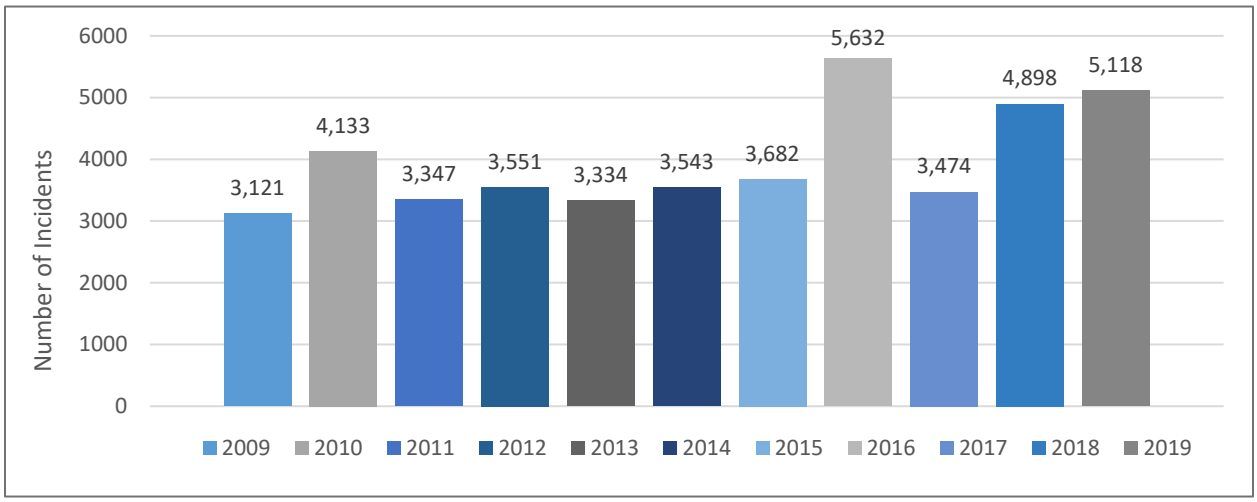


Figure 2: Incidents 2009-2019

Minnesota Power's reliability results for 2019:

Table 1: 2019 Reliability Results

	SAIDI	SAIFI	CAIDI
2019 Standard	98.19	1.02	96.26
2019 Results	144.02	1.35	106.32

Minnesota Power proposes the following weather-excluded reliability indices options as targets not to exceed in 2020:

Table 2: Proposed Reliability Goals

	MPUC Metric	IEEE 5-Year Average
SAIDI	98.19	124.8
SAIFI	1.02	1.12
CAIDI	96.26	109.8

Weather events attributed to 31 percent of SAIDI minutes in 2019, overhead equipment attributed 21 percent, and unknown13 percent. The remaining outage minutes consisted of incidents related to people (car accidents, etc.), trees, animals, underground equipment, planned outages and other causes. (More on causes of outages can be found in Section V, Page 21 of this Report.)

Weather was the largest reliability factor in 2019. Wind storms occurred at a higher frequency, particularly in April and September of 2019, which historically do not contribute significantly to overall outage totals. Minnesota Power is continually developing solutions and is executing several reliability initiatives to help minimize weather related outages. Trip savers are being installed across Minnesota Power's service territory to clear temporary faults resulting from tree contacts and lightning. Strategic undergrounding is another mitigation strategy rolling out in 2020 on some of the Company's worst performing overhead lines. The Company is targeting areas where customers do not allow access to vegetation management, such as tree trimming, and areas where overhead lines are installed cross-country in inaccessible areas with heavy vegetation.

Overhead equipment failure was also a contributing factor to reliability results in 2019. Asset renewal programs such as switch and cutout replacements, along with Trip Savers, to replace porcelain cutouts are expected to aid improvement this category. The Company is continuing the implementation of its Preventative Maintenance ("PM") program on substation and distribution equipment. This PM program includes replacement of switches, capacitor banks, and reclosers. In the future, the program will focus on transformers and regulators. By focusing on this PM program, the Company can verify that system equipment is functioning when needed. PM reviews will also more readily identify equipment that needs to be replaced or updated as part of larger asset renewal programs.

As communicated in Minnesota Power's 2019 Integrated Distribution Plan, Minnesota Power 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 expected benefits of these projects are discussed in Table 3. All of these projects are asset renewal projects whose main driver is age-related replacement of end-of-life equipment.

Table 3: 5-Year Distribution Projects

Project Name	Preliminary Projected Costs	Anticipated In-Service - Date	Project Area	Project Description
Colbyville Switchgear Replacement	$3.2M	2022	East Duluth & surrounding areas	The switchgear and outdoor breakers at the Colbyville Substation provide protection and isolation for the 13.8 kV feeders interconnected at the substation. Much of the existing

				distribution equipment at Colbyville has been in service for several decades and is nearing or beyond the end of its useful life. The Colbyville Switchgear Replacement Project involves coordinated replacement of end-of-life assets and modernization improvements designed to extend the life of the substation for the next several decades. Planned age-related replacements include switchgear, outdoor breakers, one transformer and associated equipment.
Gary Switchgear Replacement	$3.0M	2023	West Duluth	The switchgear at the Gary Substation provides protection and isolation for the 13.8 kV feeders interconnected at the substation. Much of the existing distribution equipment at Gary has been in service for several decades and is nearing or beyond the end of its useful life. The Gary Switchgear Replacement Project involves coordinated replacement of end-of-life assets and modernization improvements designed to extend the life of the substation for the next several decades. Planned age-related replacements include switchgear, one transformer and associated equipment.
Haines Rd Switchgear Replacement	$4.5M	2024	Hermantown & Central Duluth, Miller Hill Mall Area	The switchgear at the Haines Road Substation provides protection and isolation for the 13.8 kV feeders interconnected at the substation. Much of the existing distribution equipment at Haines Road has been in service for several decades and is nearing or beyond the end of its useful life. The Haines Road Switchgear Replacement Project involves coordinated replacement of end-of-life assets and modernization improvements designed to extend the life of the substation for the next several decades. Planned age-related replacements include two

				switchgear buses, two transformers and associated equipment.
Substation Modernization Program	$4.3M $2.8M $4.2M $2.0M	2021 2022 2023 2024	*Anticipated Substations*:* Meadowlands, Long Prairie, Verndale, Little Falls, Nashwauk, Wrenshall *subject to change based on asset renewal project prioritization	Across Minnesota Power's system there are many transmission-to-distribution substations that require age-related upgrades. Much of the original equipment in these substations is nearing or beyond the end of its useful life. Minnesota Power's Substation Modernization Program involves coordinated replacement of end-of-life assets and modernization improvements designed to extend the lives of these substations for the next several decades. Planned age-related replacements include outdoor breakers, transformers, switches and associated equipment. The Program will take a holistic, site-by-site approach to facilitating the coordinated and efficient modernization of the many aging substations throughout the system.

Grid Modernization

Grid modernization is and has been a priority for Minnesota Power's distribution engineering department and will be used to improve reliability throughout the service territory. Minnesota Power 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 Minnesota Power. Asset renewal programs have been bolstered in recent years in an effort to target areas known to impact customer reliability and system resiliency. Minnesota Power has taken a strategic approach that targets key feeder and substation connected assets that are both at end of life and contributing negatively to reliability. At the substation level, programs have been integrated into a single substation modernization project designed to efficiently address all of the asset renewal needs at once, as outlined in Table 3.

Reliability improvements will be implemented using new equipment such as Trip Savers, storm hardening the system via strategic undergrounding, and utilizing Fault Location, Isolation, and Service Restoration ("FLISR") technology utilizing a secure fiber-optic network to quickly isolate and restore customers through the use of intelligent reclosers, smart sensors, and motor operated equipment. The Company will expand the use of Trip Savers in 2020 and beyond. The Trip Savers are maintenance free and significantly cheaper than traditional oil filled reclosers that have been historically used for similar applications. Trip Savers are also being installed to replace porcelain fused cutouts which will reduce failures and clear temporary faults, resulting in improved reliability and reduced truck rolls.

The Company has made several advancements in tracking and improving the frequency of failed equipment. Minnesota Power recently developed a Mobile Workforce application that allows all employees to identify areas of concern on the system. Minnesota Power began accelerating the use of Mobile Workforce starting in 2017. The first phase has created paperless processing for nearly 30,000 customer orders annually. The second phase--which started in late 2018 and went live in 2019--focused on bringing trouble tickets from the Outage Management System into the Mobile Workforce application. This will allow an additional 4,000 tickets annually to be processed electronically within that application. The third and final phase of Minnesota Power's Mobile Workforce program for distribution, anticipated in 2020, will focus on the integration of work and asset management systems. In the last 30 months, the Company has received almost three thousand observations and has remedied over 72 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.

Inspection programs such as monthly substation inspections and groundline resolution on wood poles also help to identify problem areas on the distribution system. Groundline inspections utilize a third party contractor to test wood poles for shell thickness, deterioration, and infestation of insects. As items are discovered during inspections they are entered into the Company's Service Request system for follow-up. As this equipment is identified and replaced, the reliability of the newer equipment serves to reduce outages.

III. 5-Year Rolling Average Metric & IEEE Benchmarking

The Commission has kept SAIDI, SAIFI, and CAIDI targets at 2017 levels (SAIDI at 98.19, SAIFI at 1.02. and CAIDI at 96.26). These numbers have been challenging to achieve based on the increased weather related outages the Company has experienced in 3 of the last 5 years. As mentioned earlier, during years 2016, 2018, and 2019 the Company has seen more than a 25% increase of outage events compared to historical data.

Prior to 2017, the Company followed the established 5 year rolling average targets for reliability, the 5 year rolling average numbers for 2015-2019 are listed below for reference.

Table 4: 2015-2019 5-Year Rolling Averages

YEAR	SAIDI	SAIFI	CAIDI
2015	101.8197	1.1713	86.9322
2016	122.6924	1.2861	95.3958
2017	108.0604	1.0401	103.8968
2018	134.0037	1.3886	96.4998
2019	144.0182	1.3545	106.3233
Averages	122.1189	1.2481	97.8096

For comparison, IEEE 2nd quartile numbers for similar sized companies (100,000 -1 million customers) are listed below.

Table 5: IEEE 2nd Quartile

YEAR	SAIDI	SAIFI	CAIDI
2014	121	1.09	102
2015	118	1.14	112
2016	124	1.14	111
2017	128	1.11	115
2018	133	1.1	109
Averages	124.8	1.12	109.8

In its March 19, 2019 Orders accepting the utility reports, the Commission required the utilities to begin benchmarking their performance to the IEEE reliability standards. Minnesota Power began providing data to the IEEE benchmark study in 2019.

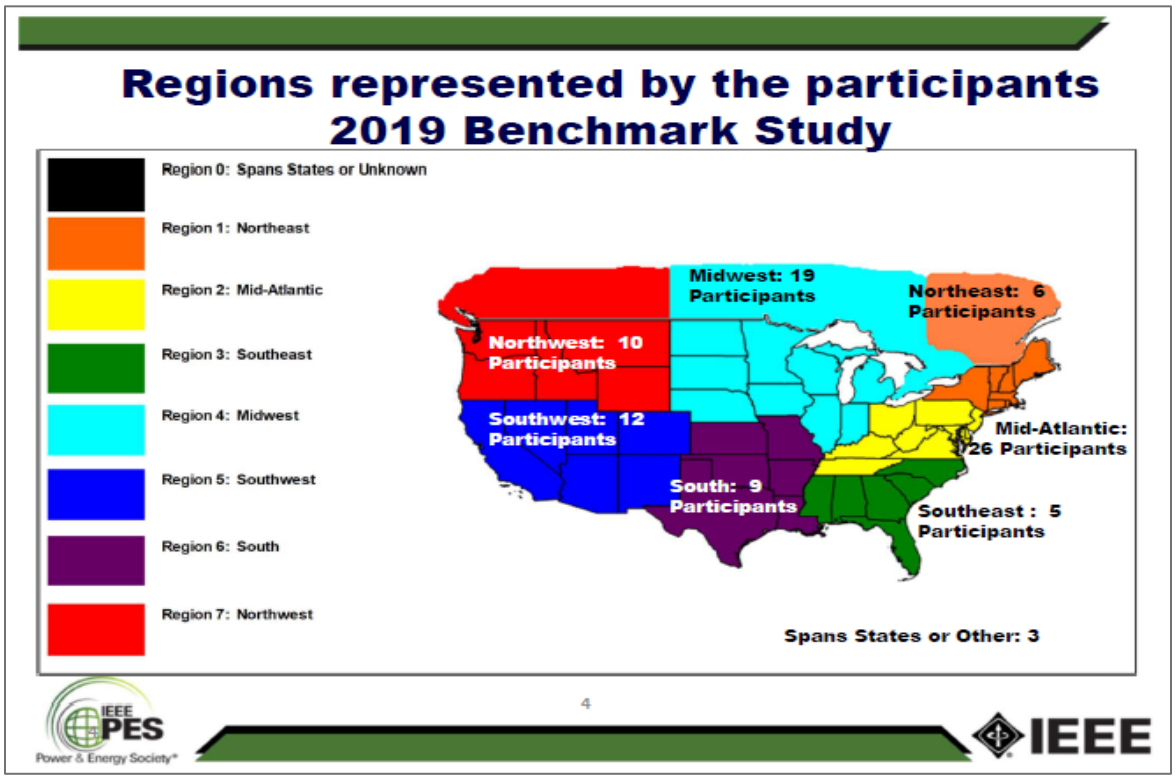


Figure 3: IEEE Benchmark Participants

As shown in Table 5 above, the Company's reliability results trend significantly closer to the 5 year average of IEEE 2nd quartile numbers. These reliability metrics take into consideration varying reporting methods, system terrain and age, and customer mix, among other factors. This depiction of reliability metrics is a more holistic view of what is happening on electric distribution systems nationwide. The Company has actively participated in the IEEE T&D Reliability Working Group over the last several years gaining valuable insights. Minnesota Power views this committee as working towards a consistent application of IEEE 1366 with other industry partners and appropriately benchmarking regionally with others of similar size on reliability measurements and efforts. Based on these experiences with IEEE, the Company proposes using the IEEE 2nd quartile numbers as reliability targets starting with Minnesota Power's 2020 Report.

IV. Colbyville 240 Feeder

The Colbyville 240 ("COL-240") feeder has been an area of focused improvement for Minnesota Power since 2018. The feeder has been under extensive engineering review in order to improve reliability. Recent reliability improvements to the area included:

- Upgrading two miles of an adjacent feeder to a larger conductor size in order to carry the COL-240 feeder during an outage event.
- Replacing three gang operated switches[1] and installing two additional switches on this feeder.
- Installing 29 Faulted Circuit Indicators ("FCIs"), and smart feeder sensors in three separate locations to assist in quickly locating faults on the feeder
- Installing 12 trip savers to upgrade older porcelain cutouts and clear temporary faults such as lightning strikes and wildlife contact.
- Part of this feeder was rebalanced and transferred to an adjacent feeder to provide Minnesota Power more switching opportunities.
- The Company is currently working on a pilot to install motor operated switches on this feeder in 2020. These remote motor operated switches will allow us to isolate faulted sections of the feeder and restore customers more rapidly without having to roll a truck and dispatch line personnel.

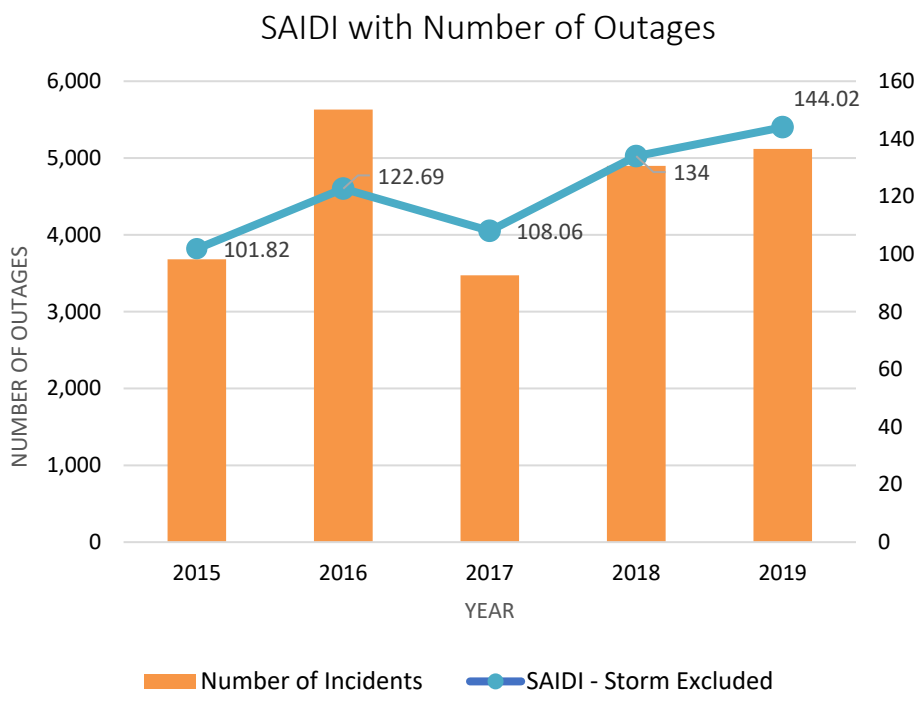
As shown in Table 6 below, reliability on the Colbyville 240 feeder has improved significantly from 2018 to 2019. Minnesota Power will continue to look for opportunities to improve the reliability of this feeder.

Table 6: Colbyville 240 - Year Reliability (Storm Excluded)

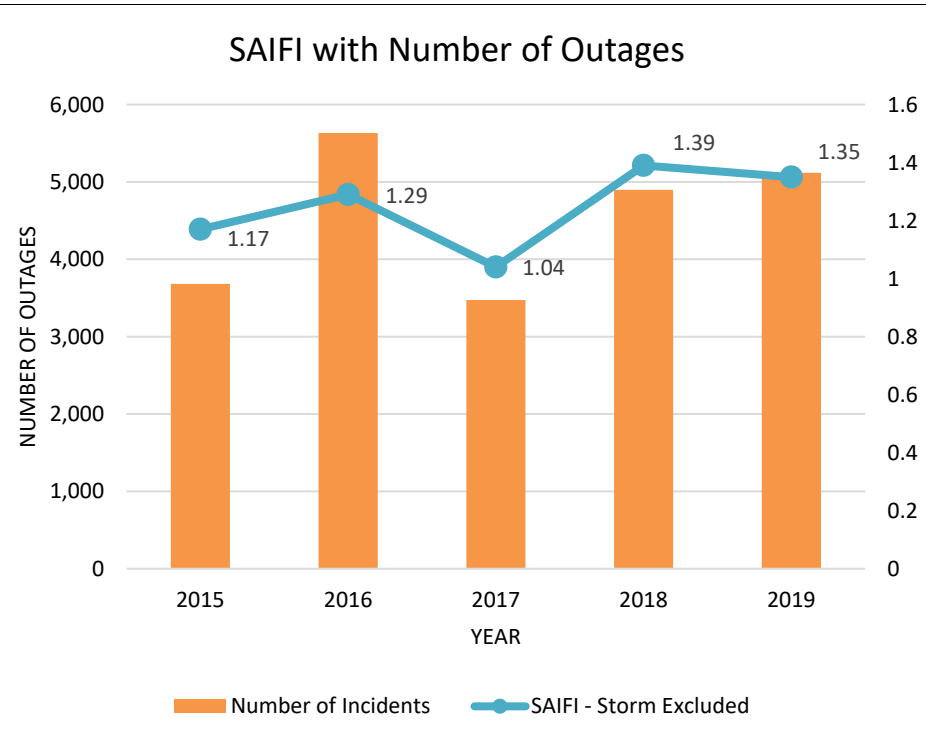
Year	SAIDI	SAIFI	MAIFI
2015	245.62	2.31	2.02
2016	198.79	2.26	1.00
2017	37.07	0.42	3.87
2018	240.01	2.06	1.00
2019	54.40	0.44	1.00

[1] Three separate switches for each phase are operated as a group from a single control; "air-break" because the switch operates in air rather than in another medium, such as oil http://c03.apogee.net/contentplayer/?coursetype=foe&utilityid=mp&id=4467

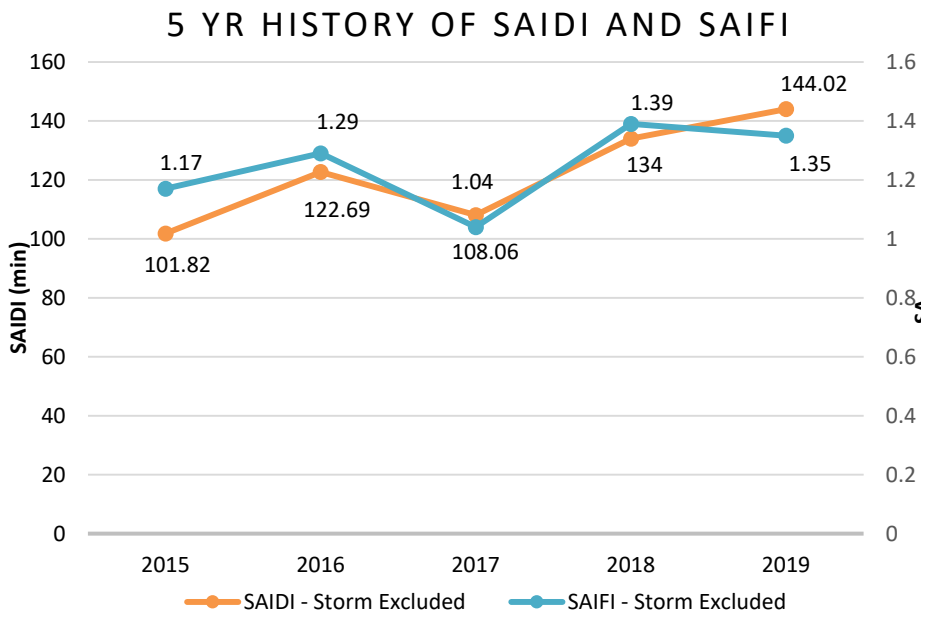
V. 2019 Summary Graphs



SAIDI is the System Average Interruption Duration Index. SAIDI provides the duration, in minutes, of the average time customers are interrupted.



SAIFI is the System Average Interruption Frequency Index. SAIFI provides the frequency of sustained power outages (longer than five minutes) experienced by the average customer.



SAIFI is an indication of how many outages an average customer experiences and SAIDI is an indication of how long the average customer is without power.

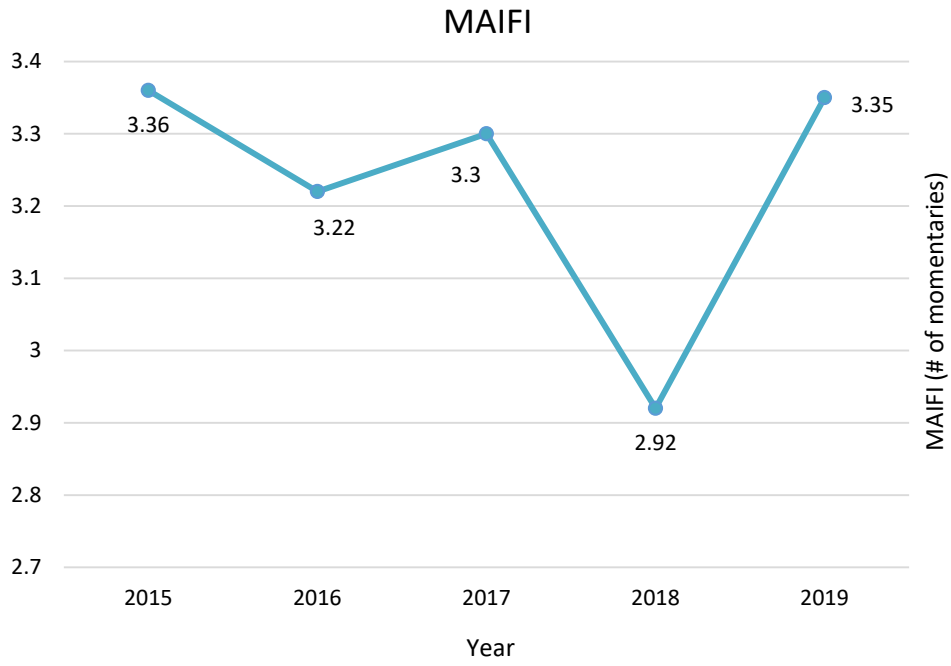
Minnesota Power resolves power quality issues on a case by case basis. When a customer calls with a complaint or questions regarding a power quality issue, Minnesota Power investigates and resolves all problems found to be caused by the Company. In the event of complaints regarding low voltage or high voltage, Minnesota Power will do an investigation of the customer's service and check for loose or overheated connections. If no problem is found or if the problem is intermittent, the Company will install a recording voltmeter. This meter allows for monitoring of the voltage over time and under various customer and system loading conditions. If those recordings demonstrate that the Company is not meeting its prescribed voltage standards, Minnesota Power performs the required maintenance in order to bring the voltage within the limits stated in its Distribution Standards. There are seldom requests from customers for power quality studies. The Company has observed that customers seem to experience fewer power quality issues than in years past.

MAIFI

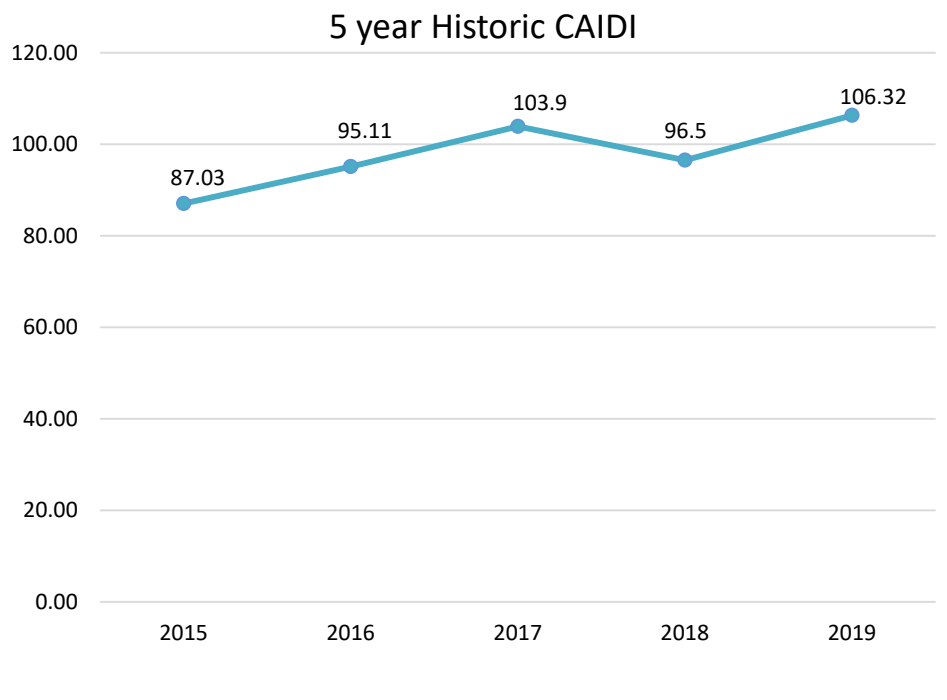
The Momentary Average Interruption Frequency Index ("MAIFI") index provides a measure of the average number of short outages, an interruption of electrical service that Minnesota Power defines as lasting less than five minutes that an average customer experiences in a year. While Minnesota Power has tracked MAIFI statistics for the last decade, it has done so with the knowledge that the Company's MAIFI data collection is and will continue to be incomplete without a significant investment in the technology necessary to enable Minnesota Power to collect and report all momentary outages. The accuracy of the MAIFI index will increase as incident tracking technologies continue to develop and are deployed across the distribution system. The Company continues to evaluate the cost of implementation versus the potential benefits. As the capability to collect momentary information improves, the performance trend of the statistics may likely appear to degrade.

Momentary outage data is collected a few ways. About 30 percent of Minnesota Power's systems report through supervisory control and data acquisition ("SCADA"). The remaining data is collected manually. Some is collected to satisfy a specific customer request, and some is collected

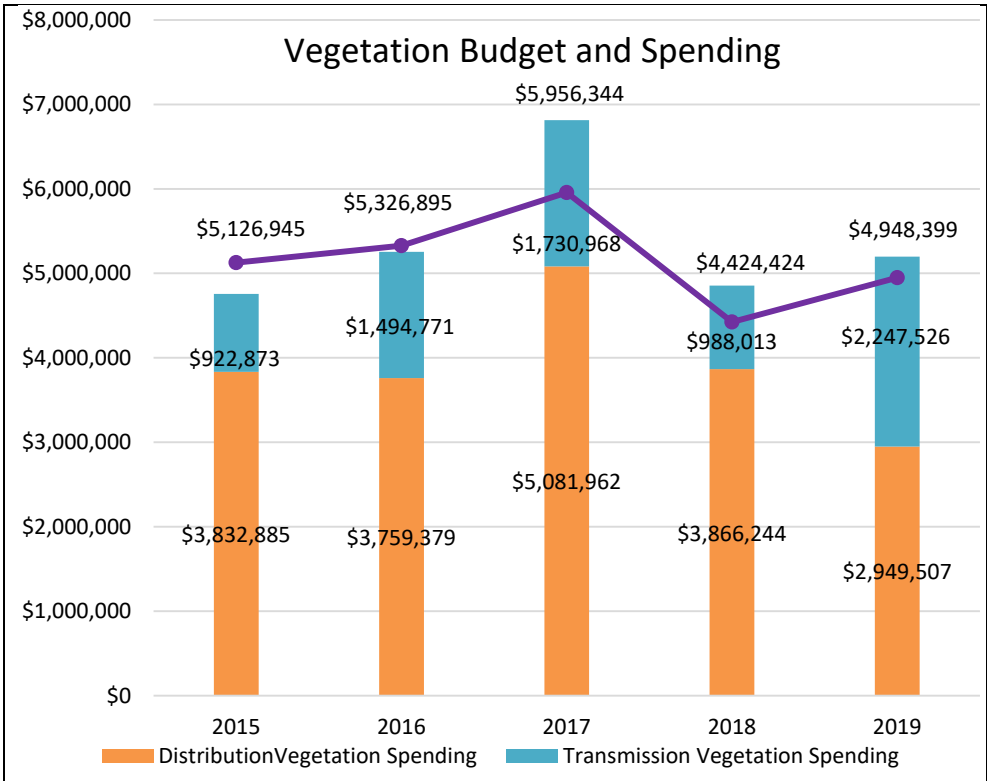
when device maintenance is done. The rest is collected in the Outage Management System ("OMS") from customer phone calls reporting a brief interruption.



MAIFI is the Momentary Average Interruption Frequency Index.

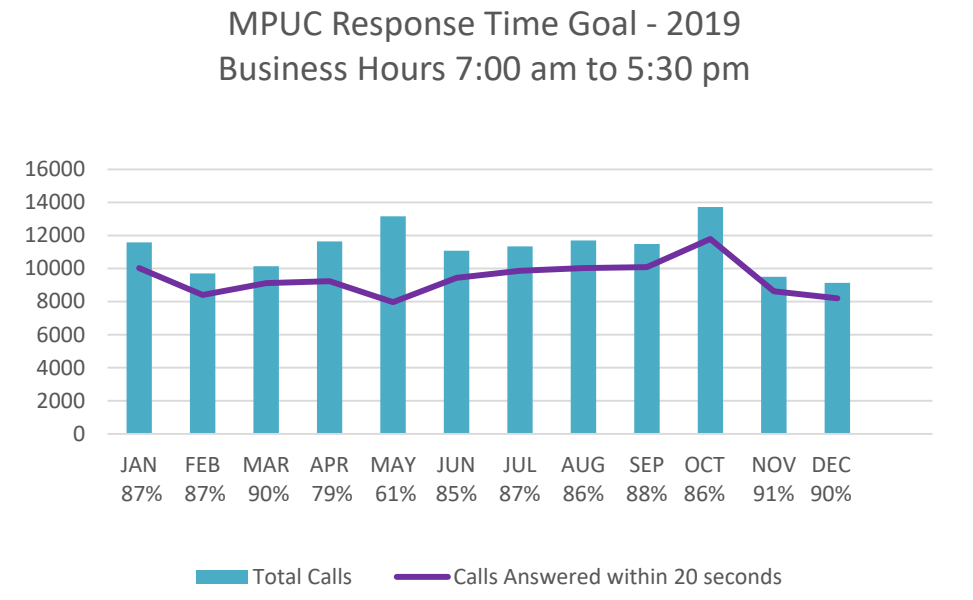


Customer Average Interruption Duration Index ("CAIDI") is derived by dividing SAIDI by SAIFI. The statistic generally speaks to the amount of time needed to respond to an outage.

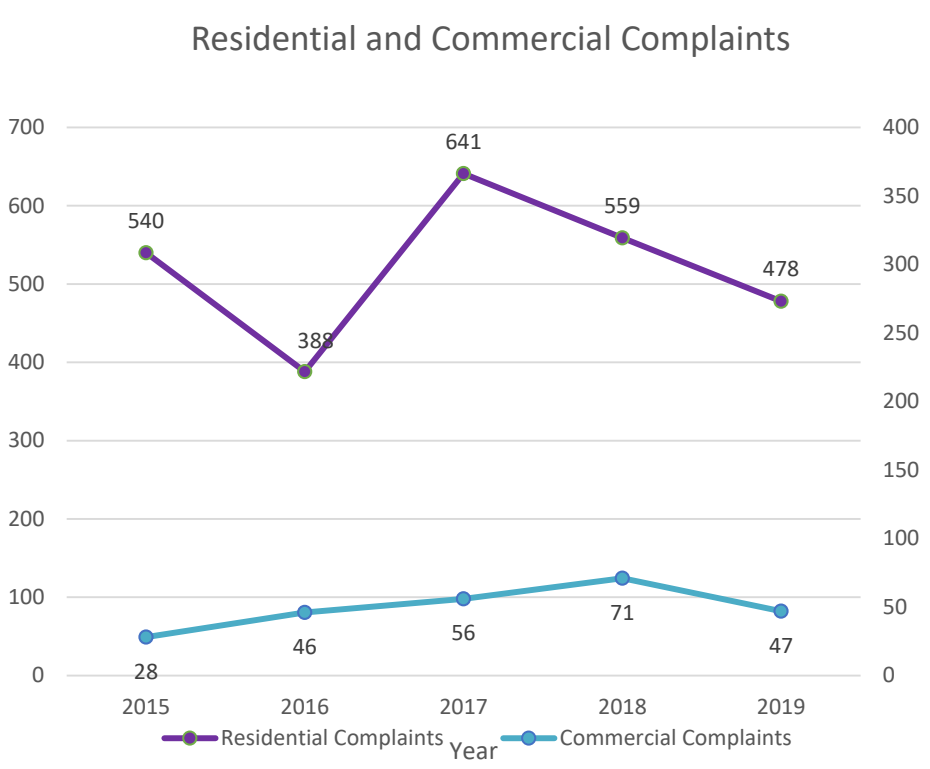


Total vegetation budget and spending on the Minnesota Power's system for 2015-2019.

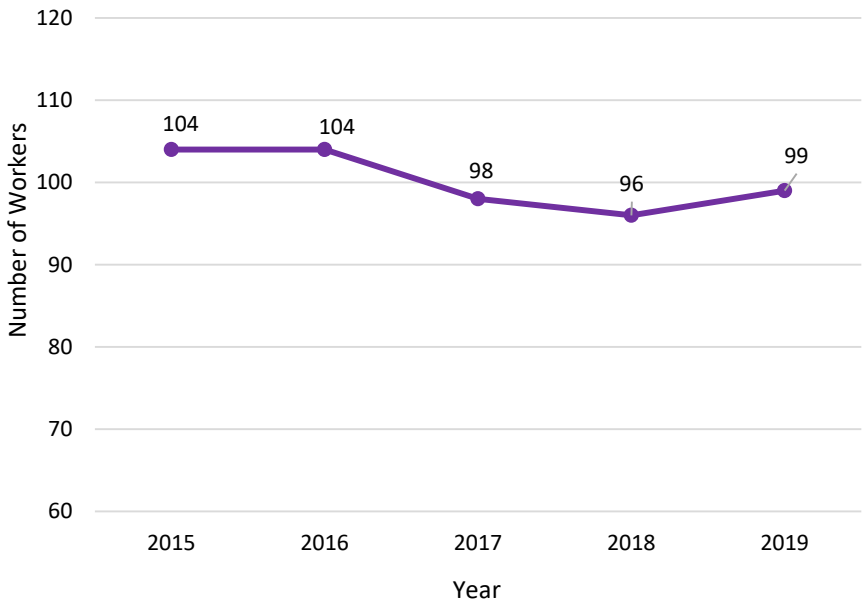
The following tables outline information related to customer care and response. Detailed information can be found in Appendix A of this Report.



Answering a call in 20 seconds generally equates to three rings. The standard, as defined in Minn. Rule 7826.1200, is 80 percent of calls during regular business hours are answered in 20 seconds.

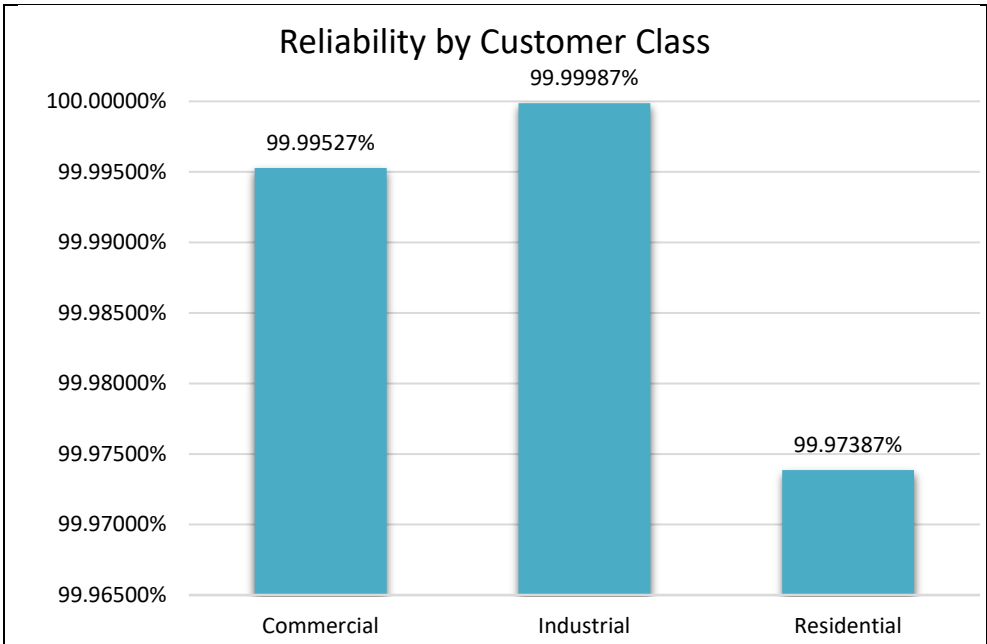


Customer complaints are generally tracked for potential billing errors, possible inaccurate metering, wrongful disconnection, service extension intervals, service restoration intervals, etc.



Minnesota Power had 99 full-time equivalent employees in Field Operations during 2019.

**The count of employees available for trouble calls. It does not encompass all field operation employees or contracted workers.*

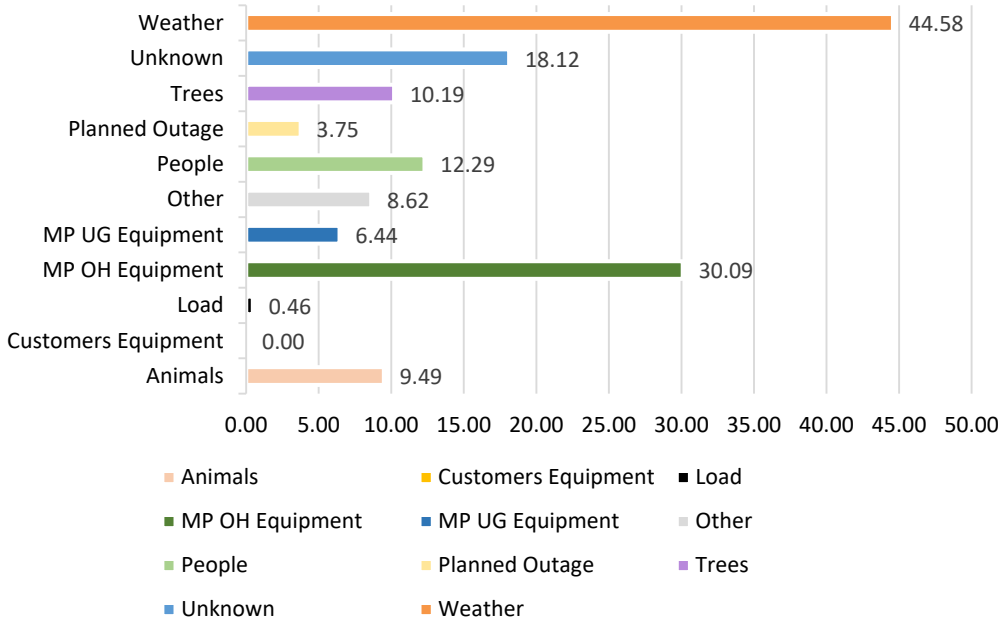


Average reliability by customer class. These averages were calculated by taking outage numbers from each class and determining their overall reliability by time served.

VI. Reliability Cost Matrix

Minnesota Power has provided summary information to assist stakeholders in understanding the Company's overall system reliability and the main factors that affect reliability. The Company has prepared the charts and graphs below in an effort to convey what it believes are the main contributing factors that can impact the long-term reliability metrics of the distribution system. The graphs and charts below show the contributing factors to SAIDI and SAIFI and the relationship between operational performance and cost. The Company strives to provide information in an easily understandable format.

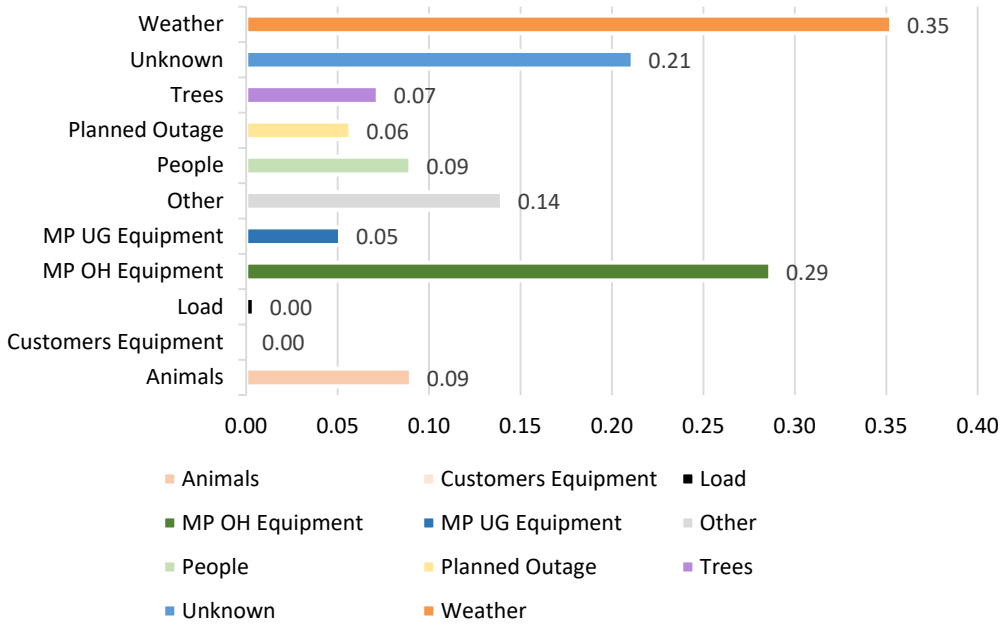
SAIDI



This chart demonstrates the percentage of Company non-storm excluded SAIDI reported by each of the identified causes.

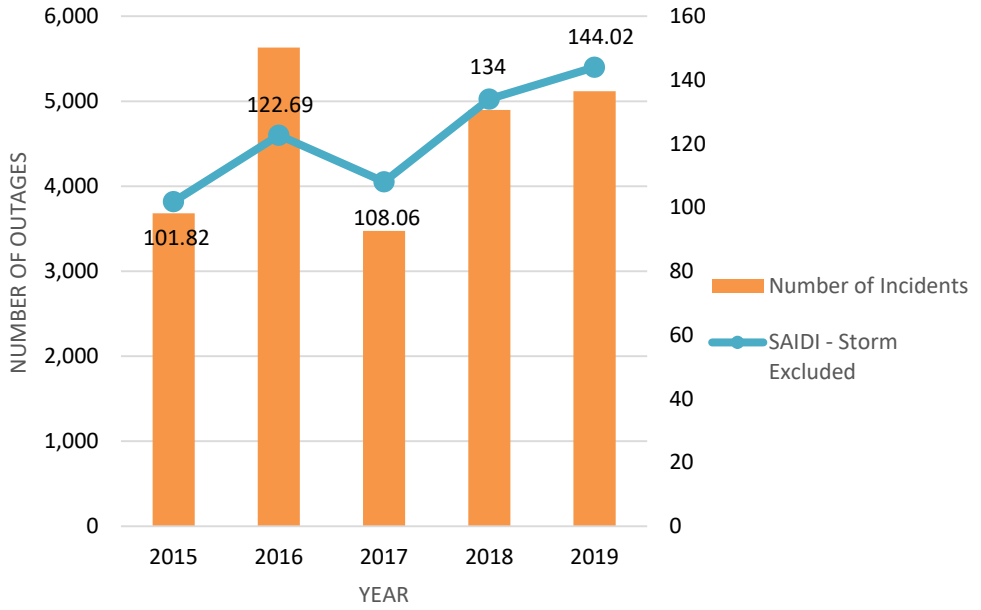
OH – Overhead
UG – Underground

SAIFI

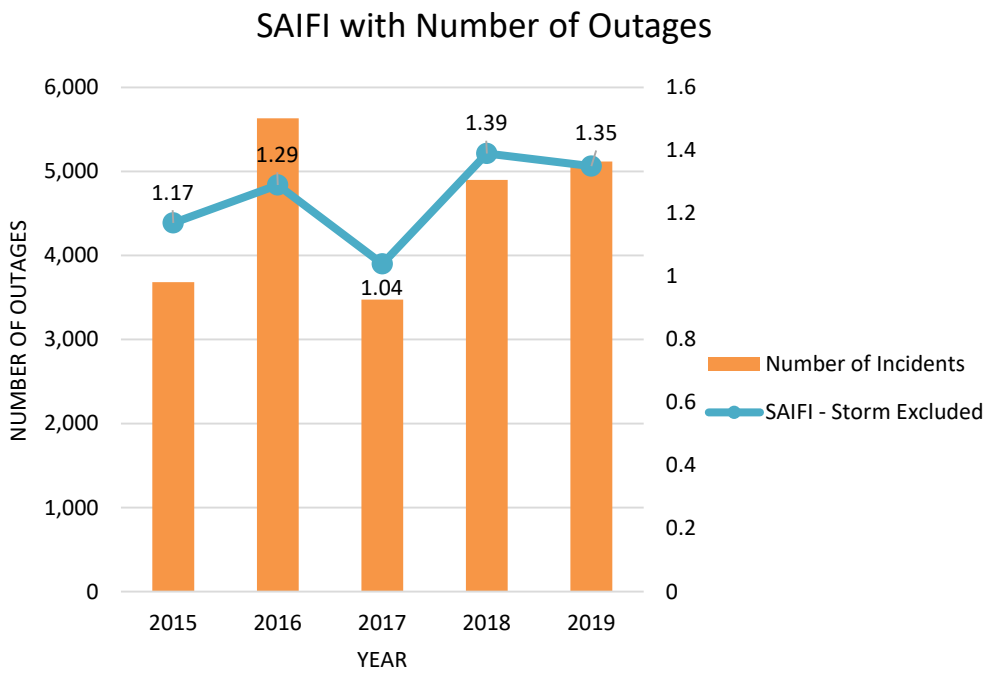


This chart demonstrates the percentage of Company non-storm excluded SAIFI reported by each of the identified causes.

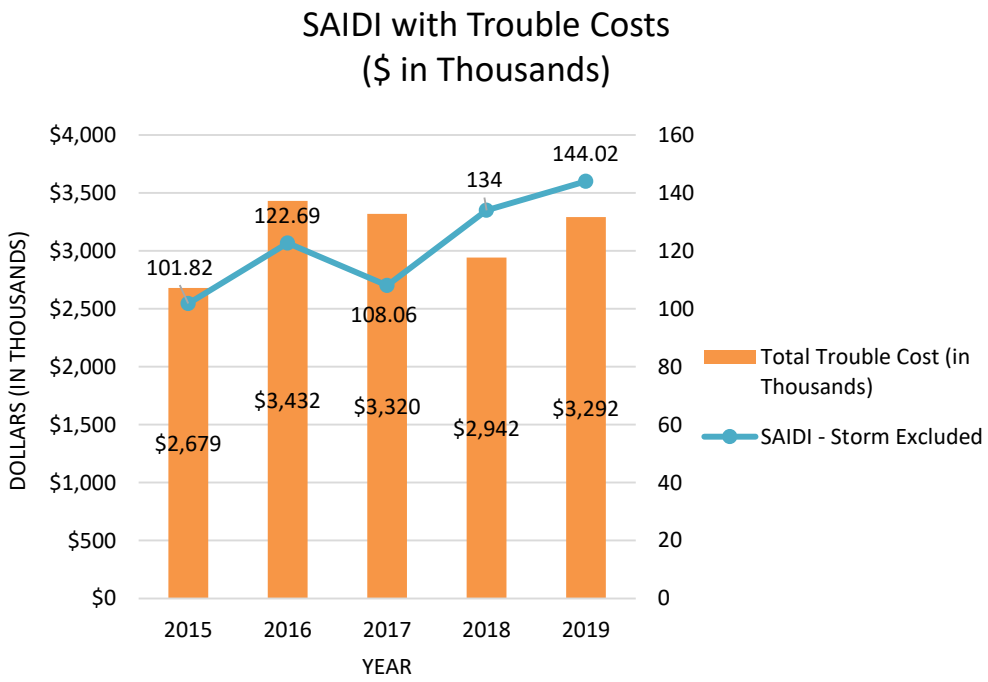
OH – Overhead
UG – Underground



This chart presents SAIDI against Minnesota Power's historic number of outages 2015-2019.

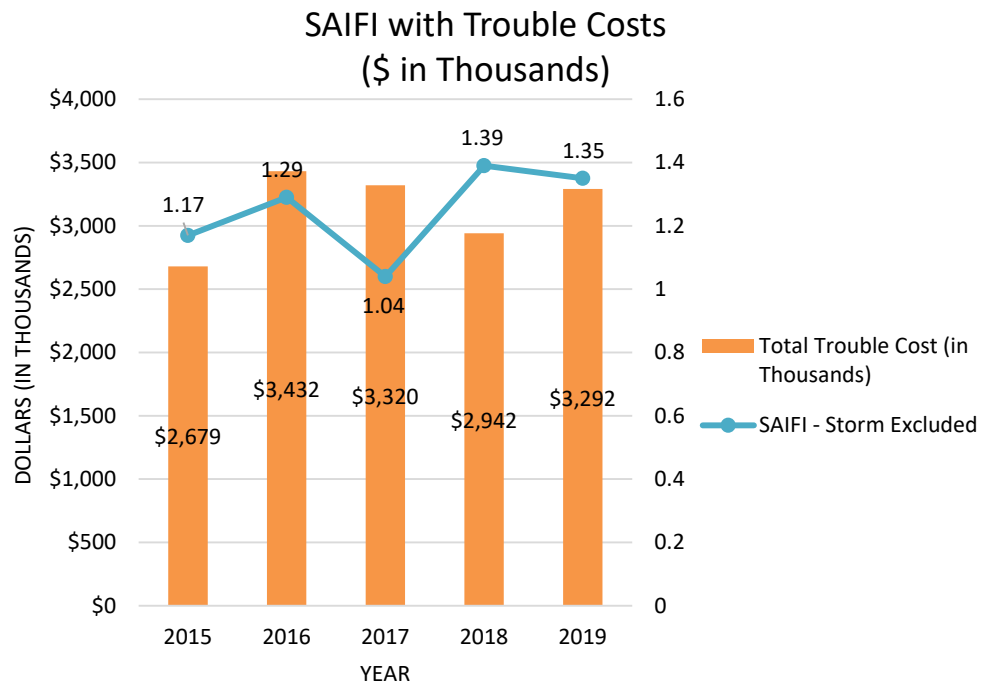


This chart presents SAIFI against Minnesota Power's historic number of outages 2015-2019.



This chart shows SAIDI with operation & maintenance dollars spent on trouble calls 2015-2019.

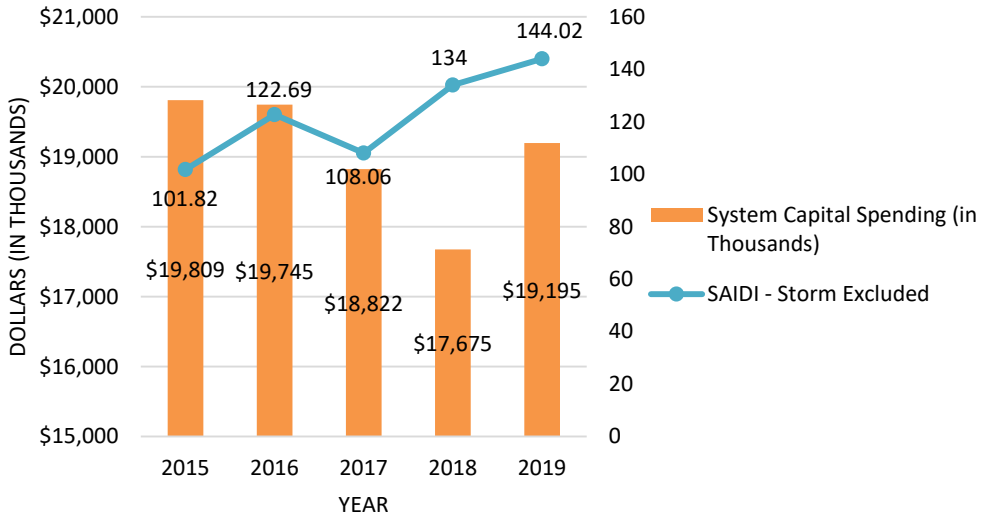
This is unplanned work done without the replacement of capital assets.



This chart shows SAIFI with operation & maintenance dollars spent on trouble calls 2015-2019.

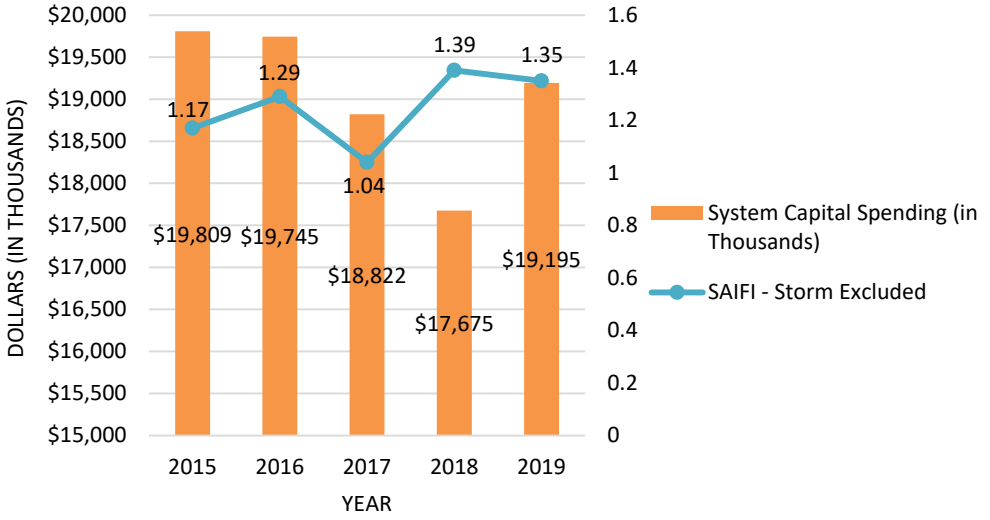
This is unplanned work done without the replacement of capital assets.

SAIDI with Capital Spending ($ in Thousands)

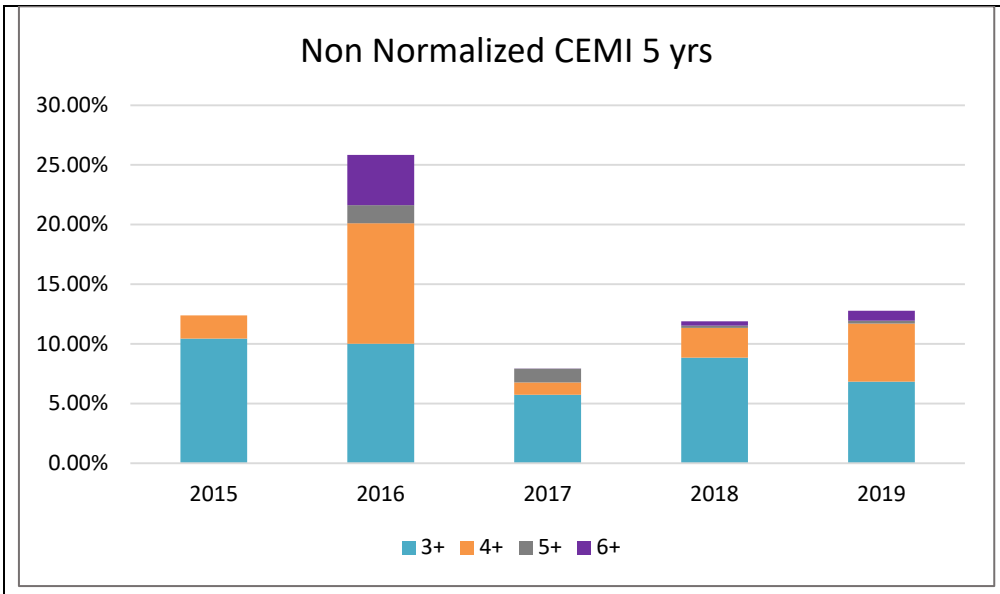


This chart shows SAIDI compared to capital dollars spent on distribution system 2015-2019.

SAIFI with Capital Spending ($ in Thousands)

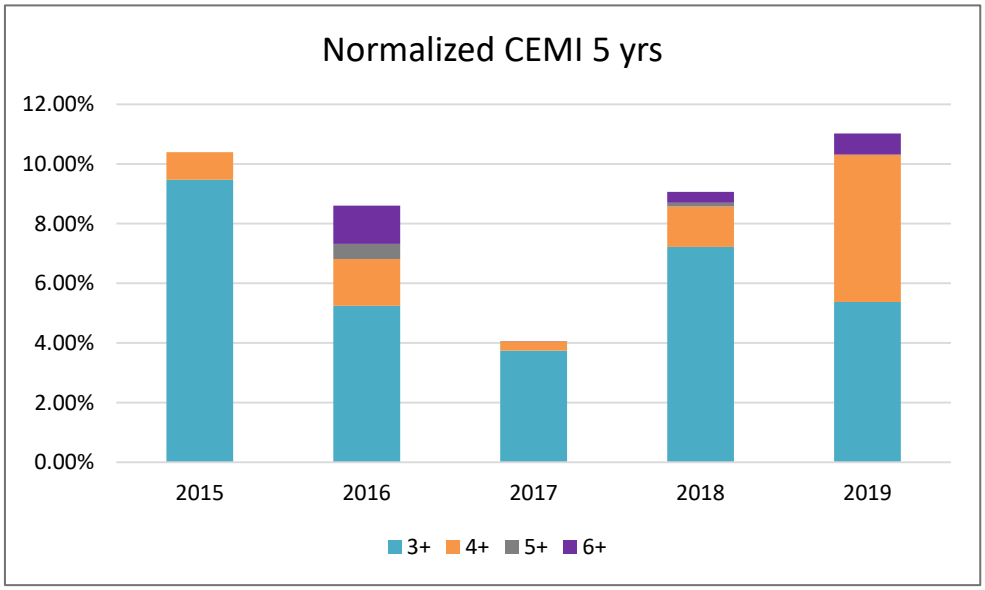


This chart shows SAIFI compared to capital dollars invested on distribution system 2015-2019.



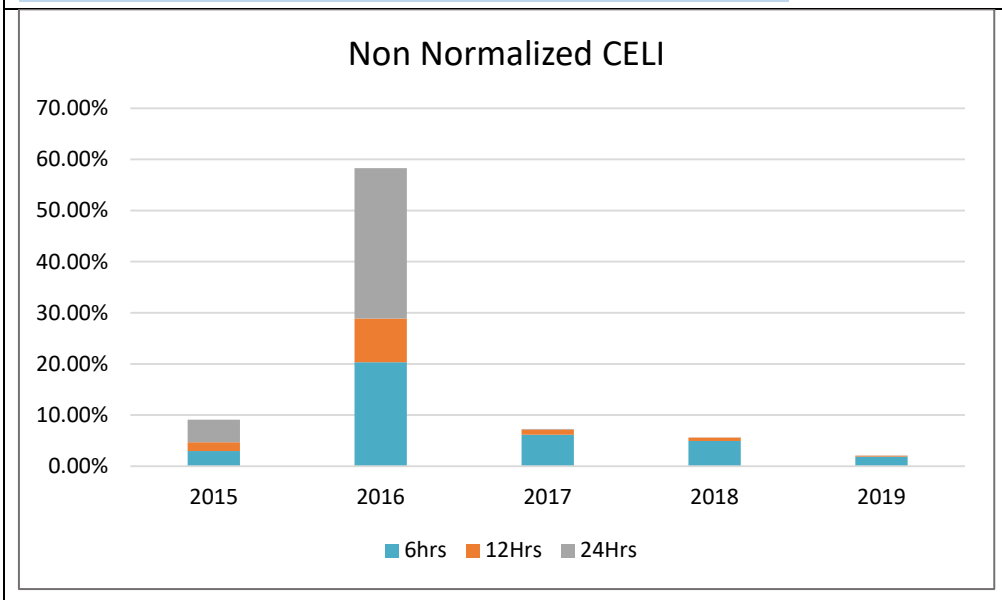
	2015	2016	2017	2018	2019
6+	0.00%	4.21%	0.00%	0.36%	0.83%
5+	0.00%	1.51%	1.14%	0.18%	0.24%
4+	1.95%	10.09%	1.04%	2.50%	4.87%
3+	10.45%	10.02%	5.73%	8.85%	6.84%

Customers experiencing multiple interruptions measures the percent of overall customers that have experienced more than a specific number of interruptions.



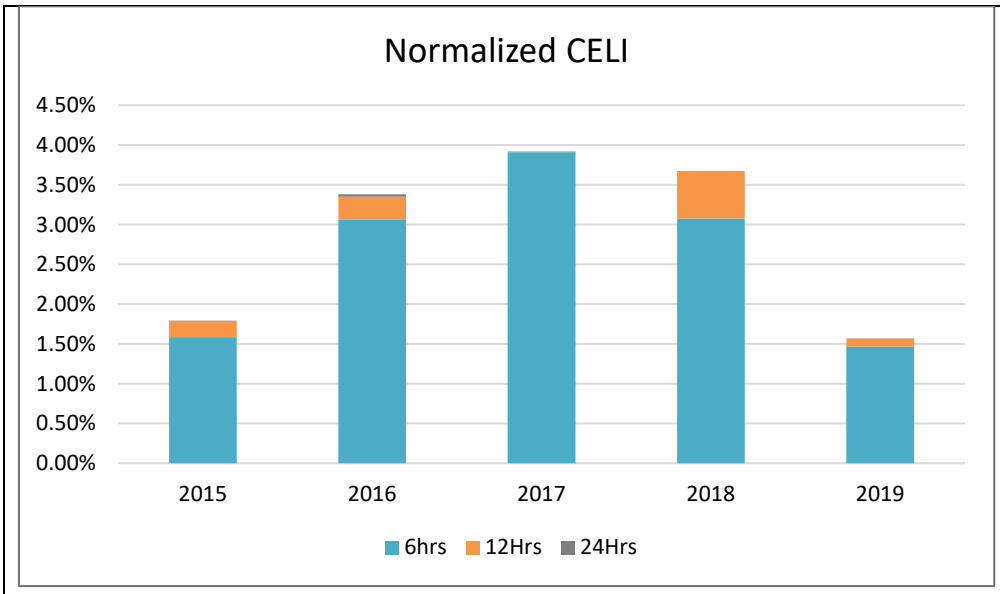
	2015	2016	2017	2018	2019
6+	0.00%	1.28%	0.00%	0.36%	0.71%
5+	0.00%	0.51%	0.00%	0.12%	0.01%
4+	0.92%	1.56%	0.31%	1.36%	4.93%
3+	9.47%	5.24%	3.75%	7.22%	5.38%

Customers experiencing multiple interruptions measures the percent of overall customers that have experienced more than a specific number of interruptions.



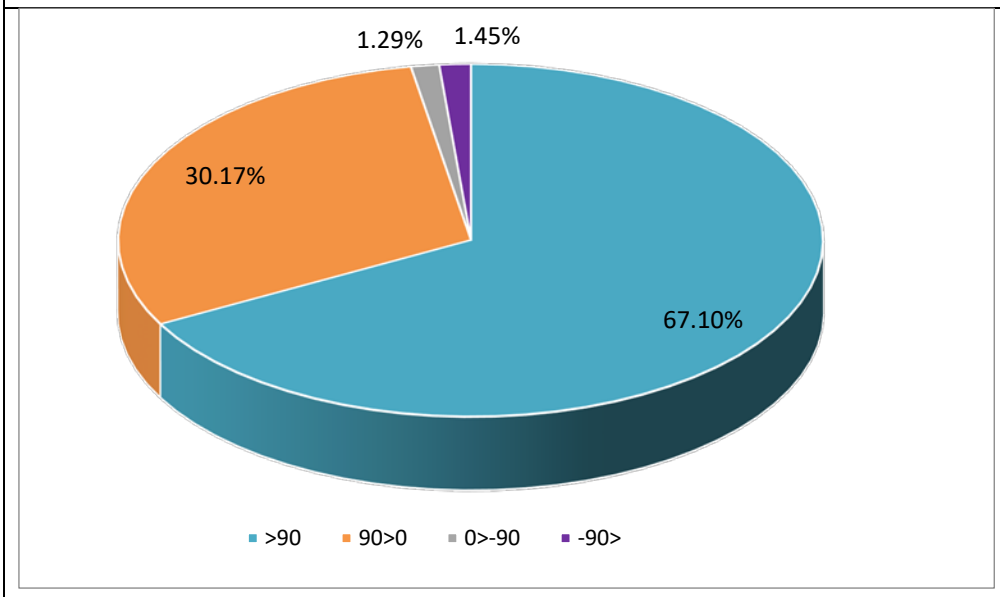
	2015	2016	2017	2018	2019
6hrs	2.69%	20.31%	6.17%	4.93%	1.86%
12hrs	1.74%	8.56%	1.01%	.66%	.19%
24hrs	4.41%	29.40%	.11%	.01%	.02%

Customers experiencing lengthy interruptions provides insight into the number of customers who experience an outage greater than 6, 12, 24 hours.



	2015	2016	2017	2018	2019
6hrs	1.58%	3.06%	3.91%	3.07%	1.46%
12hrs	.20%	.29%	.01%	.59%	.10%
24hrs	.01%	.03%	.00%	.01%	.00%

Customers experiencing lengthy interruptions provides insight into the number of customers who experience an outage greater than 6, 12, 24 hours.



>90	90>0	0>-90	-90>
3805	1711	73	82
67.10%	30.17%	1.29%	1.45%

Estimated Restoration Time Accuracy

+ is over estimation
- is under estimation

Customer Service

Customer Care

Minnesota Power recognizes that, above all else, customers expect reliable, safe, and affordable electricity, as illustrated in Figure 3. Inherent to each of these are quality customer interactions through a variety of channels (i.e. in person, in writing, via email, over the phone, online, through social media, and in the field). Further, convenience, transparency about services, timely updates regarding interruption to services, and clarity about costs and program offerings are essential to the customer experience.

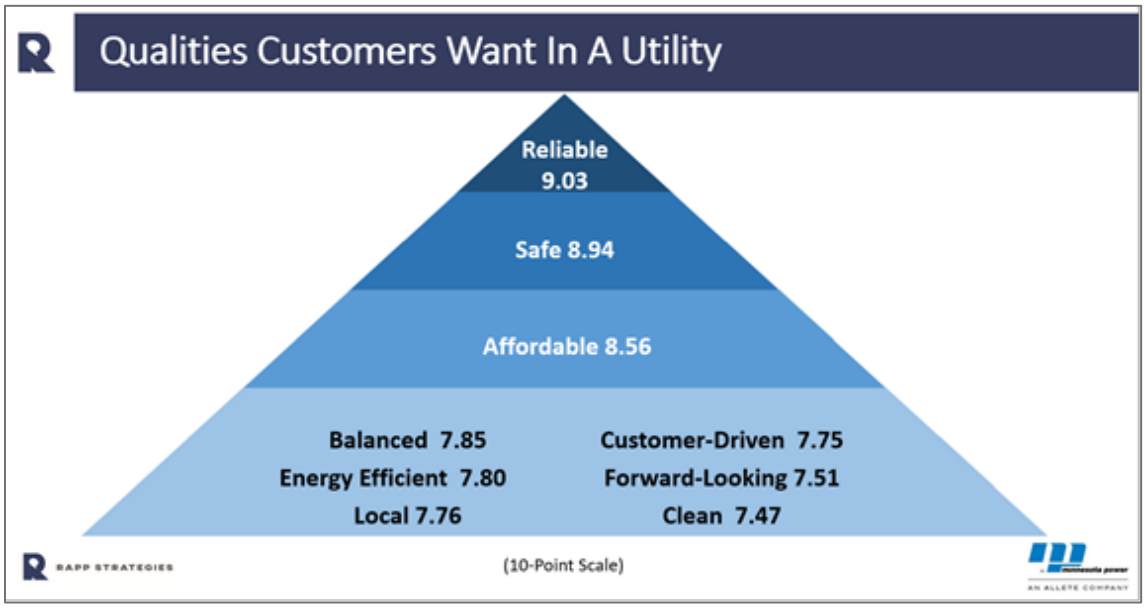


Figure 4: Customer Expectations Survey Results[2]

Our 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 meeting or exceeding formal service quality expectations related to response times for customer calls and establishing or restoring service in a timely manner.

Minnesota Power also seeks to leverage technology advances where applicable and practical to improve convenience and ensure a positive experience for our customers, which means customer relations and the customer experience are always evolving. This is inclusive of day-to-day interactions between the Company and our 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 and social media, both of which have proven to be effective for requesting services and for receiving updates affecting services such as outages.

[2] Minnesota Power Residential Customer Survey - Reputation, RAPP STRATEGIES (2019).

VII. System Construction and Protection

Voltage Monitoring

Smart Grid line sensors replaced obsolete line voltage and outage monitors in 2017. The new technology improves system monitoring including outages, voltage levels (under or over), current levels, 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.

Vegetation Management

Vegetation Management is a cost effective and essential way in which to improve reliability and reduce momentaries on the distribution system. System reliability can be adversely impacted by many external environmental factors. 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 a vegetation management program to address each distribution line approximately every six years and transmission lines every seven years. Vegetation management benefits the system in various ways.

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

Minnesota Power's vegetation management program for its distribution system has 340 electrical circuits spanning 4,753 miles of distribution right-of-way. Routine vegetation management activities are typically scheduled on a six year timetable, but this schedule may be advanced or delayed depending on actual conditions. Since vegetative growth depends on many conditions such as: precipitation, temperature, length of growing season, type of vegetation, soil fertility, and the time of year the circuit was previously maintained; the actual maintenance schedule may be longer or shorter than six calendar years.

Vegetation maintenance is normally accomplished through tree trimming, 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 Minnesota Power 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 6 year basic cycle. The Company's vegetation management program utilizes a credentialed forester and two 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 7 lists the individual circuits scheduled to receive routine maintenance that have not had vegetation maintenance in the six years prior to December 31, 2019. Together, they represent 5.9 percent of the Company's total distribution system by line miles. 17 (160 miles) of these circuits will be completed in 2020.

Table 7: Circuits outside of 6-year trimming cycle

Substation	Feeder	Mileage	Completed	Scheduled	Years
CLQ-412	Cloquet 412	2.3	2012	2020	8
CRS-1	Camp Ripley South 1	8.9	2013	2020	7
FLN-1	Flensberg 1	1.9	2012	2020	8
FLN-2	Flensberg 2	23.3	2012	2020	8
FTR-1	Fort Ripley 1	5.2	2012	2020	8
MEN-1	Menahga 1	6.8	2013	2020	7
MLT-414	Military Rd. 414	0.1	2013	2020	7
MOT-1	Motley 1	19.4	2013	2020	7
MOT-2	Motley 2	2.8	2013	2020	7
PQT-507	Pequot Lakes 507	1.8	2012	2020	8
RDL-1	Round Lake 1	7.5	2013	2020	7
RDL-2	Round Lake 2	0.5	2013	2020	7
RIC-1	Rice 1	5.4	2013	2020	7
ROY-1	Royalton 1	11.8	2013	2020	7
ROY-2	Royalton 2	13.2	2013	2020	7
SLS-1	Spirit Lake 1 (Menahga)	10.2	2013	2020	7
SPR-1	South Pine River 1	39.0	2013	2020	7
CQB-6301	Cloquet Big Lake 6301	20.6	2013	2021	8
MHR-451	Moorhead Road	12.1	2013	2021	8
SAW-6311	Sawyer 6311	18.8	2013	2021	8
TML-1	Ten Mile Lake 1	22.0	2013	2021	8
TMS-412	Thompson H.E. 412	18.9	2013	2021	8
WAK-1	Walker A	10.2	2013	2021	8
WBK-1	Walker B	13.4	2013	2021	8
WYE-1	Walker Sub 3	6.7	2013	2021	8

Line Inspection Program

Minnesota Power has an active line inspection program which includes the inspection of each pole on a ten year cycle. Poles that are 20 years and older are bored and checked internally for structural integrity. Approximately 15,000 poles, or ten percent, 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 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 second year of its second

complete ten year cycle. The Company estimates that the average age of the poles in its service territory are 35 years old and the average age of a replaced pole is approximately 50 years old. Minnesota Power has found this to be a prudent and logical way of evaluating and replacing the poles on its system.

Emergency Preparedness and Mutual Aid

Mutual aid is the cooperation between utilities to provide labor and vehicles to a utility so profoundly affected by outages that it is unlikely they will have the ability to restore power to all of their customers within four to seven days. A robust protocol has been developed between the Midwest Mutual Assistance Group ("MMAG") which is comprised of 34 investor owned utilities. Generally, a utility calls upon Mutual Aid when they face a week or more of outage times and multiple weeks of restoration work. To begin the process, Mutual Aid member representatives are contacted via e-mail, text message and finally a call by an interactive voice response unit. Each company has a minimum of two (and most have three) Mutual Aid representatives so attendance by each utility on the conference call is virtually guaranteed. At the beginning of a Mutual Aid call, the moderator references a spreadsheet with all of the utility names and their representatives. The moderator will work utility by utility obtaining and recording system status, utility needs and utility resources. After all of the utilities have reported, the most effective response coordination is formulated and finalized.

Table 8: Mutual Aid 2019

Xcel Energy Storm	White Bear Lake, MN	7/16/2019
Xcel Energy Storm	Rice Lake, WI	7/20-7/21/2019
Manitoba Hydro	Manitoba	10/14-10/24/2019
Xcel Energy Storm	Ashland, WI	11/27/2019

In October 2019, a slow-moving snowstorm hit Manitoba, bringing heavy wet snow and high winds. Minnesota Power sent 10 lineworkers and four support personnel, including two crew members from Superior Water Light and Power, more than 500 miles to help restore service to customers. Crews spent about two weeks in Manitoba working long days in unforgiving wet and muddy conditions. It was the first time in Manitoba Hydro's history that it asked for mutual aid assistance from other utilities, underscoring the scope of the damage, and also the first time that Minnesota Power sent crews to Canada to help restore power after a major storm.

Figure 5: Damage from October Storm in Manitoba

The Edison Electric Institute presented Minnesota Power with the EEI “Emergency Assistance Award” for its response efforts in Manitoba. 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 conditions or other major incidents. The winners are chosen by a panel of judges following an international nomination process. Minnesota Power received the award during EEI’s Winter Board and Chief Executives Meeting on January 8, 2020 in Tucson, Ariz.

Figure 6: Al Hodnik, ALLETE chairman and CEO (left), was in Tucson to receive the Emergency Assistance Award from the Edison Electric Institute. With him is Tom Kuhn, EEI president.

Minnesota Power and Superior Water, Light and Power have received several Emergency Assistance Awards in recent years including for response to Puerto Rico in 2018 after Hurricane Maria and in the Miami area in 2017 assisting Florida Power and Light after Hurricane Irma.

VIII. Conclusion

Minnesota Power respectfully submits information on its Safety, Reliability and Service Quality metrics. The Company appreciates the opportunity to provide relevant information regarding its distribution system and customer care efforts. This information can be utilized by stakeholders to gain a better understanding of 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. The multitude of factors that affect the system and influence customer expectations necessitates a nimble and forward-looking planning process. Minnesota Power acknowledges the Commission's concern surrounding the Company's reliability metrics and has in turn enacted a robust and aggressive investment plan to increase resiliency. This investment plan will serve to increase reliability and resiliency on the Company's system in coming years. Minnesota Power works towards the goal of meeting customer's needs while also maintaining the core tenets of a reliable, safe and affordable grid.