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April 1, 2019

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

RE: In the Matter of Otter Tail Power Company 2018 Annual Safety, Reliability and Service Quality Report and Proposed SAIFI, SAIDI and CAIDI Reliability Standards for 2019
Docket No. E017/M-19-

Dear Mr. Wolf:

Otter Tail Power Company (Otter Tail) submits the enclosed Annual Report pursuant to Minn. Rules 7826.0400, 7826.0500, and 7826.1300. This Annual Report presents our safety, reliability, and service quality performance for the year 2018 and proposed reliability standards for 2019 pursuant to Minn. Rule 7826.0600. Otter Tail's proposed reliability standards for 2019 are found in Table 1 of Section IV, in the attached Annual Report and Petition.

Otter Tail has electronically filed this document with the Commission. In compliance with Minn. Rule 7829.1300, subp. 2, Otter Tail is serving a copy of this filing on the Department of Commerce – Division of Energy Resources and Office of Attorney General – Antitrust & Utilities Division. A Summary of the filing has been served on all persons on Otter Tail's general service list. A Certificate of Service is also enclosed.

We are available to provide any additional information or respond to any questions you may have. Feel free to contact me at (218) 739-8699 or email me at wolson@otpco.com.

Sincerely,

/s/ WENDI OLSON
Wendi Olson
Regulatory Compliance Specialist

jch
Enclosures
By electronic filing
c: Service List

STATE OF MINNESOTA
BEFORE THE
MINNESOTA PUBLIC UTILITIES COMMISSION

In the Matter of Otter Tail Power Company's 2018 Annual Safety, Reliability and Service Quality Report and Proposed SAIFI, SAIDI and CAIDI Reliability Standards for 2019	Docket No. E017/M-19-

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SUMMARY OF FILING

Please take notice that on April 1, 2019, Otter Tail Power Company (Otter Tail), filed with the Minnesota Public Utilities Commission its annual Safety, Reliability and Service Quality Report for 2018 pursuant to Minnesota Rules 7826.0400, 7826.0500 and 7826.1300. Pursuant to Minnesota Rule 7826.0600, subp. 1, Otter Tail proposes SAIFI, SAIDI and CAIDI reliability standards for 2019.

STATE OF MINNESOTA
BEFORE THE
MINNESOTA PUBLIC UTILITIES COMMISSION

In the Matter of Otter Tail Power Company's 2018 Annual Safety, Reliability and Service Quality Report and Proposed SAIFI, SAIDI and CAIDI Standards for 2019	Docket No. E017/M-19-

ANNUAL REPORT AND PETITION

I. INTRODUCTION

Otter Tail Power Company (Otter Tail or the Company), submits this filing in compliance with Minnesota Rules 7826.0400, 7826.0500, 7826.0600, subp. 1, and 7826.1300. This filing also includes compliance items from previous Minnesota Public Utilities Commission (Commission) Orders.

II. GENERAL FILING INFORMATION

Pursuant to Minnesota Rule 7829.1300, subp. 4, Otter Tail provides the following general information.

A. Name, Address, and Telephone Number of Utility

Otter Tail Power Company
215 South Cascade Street
P. O. Box 496
Fergus Falls, MN 56538-0496
(218) 739-8200

B. Name, Address, and Telephone Number of Utility Attorney

Cary Stephenson
Associate General Counsel
Otter Tail Power Company
215 South Cascade Street
P. O. Box 496
Fergus Falls, MN 56538-0496
(218) 739-8956

C. Date of Filing and Effective Date

This Report is being filed on April 1, 2019. The proposed reliability standards will be effective for the calendar year 2019.

D. Title of Utility Employee Responsible for Filing

Wendi Olson
Regulatory Compliance Specialist
Otter Tail Power Company
215 South Cascade Street
P. O. Box 496
Fergus Falls, MN 56538-0496
(218) 739-8699

III. MISCELLANEOUS INFORMATION

A. Service on Other Parties

Pursuant to Minnesota Rule 7829.1300, subp. 2 and Minnesota Statute §216.17, subd. 3, Otter Tail has electronically filed this Report and Proposed 2019 Reliability Standards. A summary of the filing has been served on all parties on the attached service list.

B. Summary of Filing

A one-paragraph summary of the Report is attached pursuant to Minnesota Rule 7829.1300, subp. 1.

IV. DESCRIPTION AND PURPOSE OF FILING

A. Annual Reporting

Minnesota Rules 7826.0400, 7826.0500 and 7826.1300 require electric utilities to file reports on safety, reliability, and service quality performance for the prior year. Otter Tail's 2018 Safety, Reliability, and Service Quality Report is attached.

B. Proposed reliability standards for 2019

Minnesota Rules 7826.0600 subp. 1, requires electric utilities to propose reliability performance standards for each of its work centers. The rule requires the performance

standards be filed on or before April 1 of each year. The utility is to propose standards for the following reliability indices:

1. System average interruption duration index or SAIDI
2. System average interruption frequency index or SAIFI
3. Customer average interruption duration index or CAIDI

In compliance with Minnesota Rules 7826.0600 Subpart 1, Otter Tail includes proposed 2019 reliability performance standards for each of Otter Tail's work centers. As ordered in **Docket No. E017/M-15-322 dated August 14, 2015**, Otter Tail's reliability standards have been frozen at 2013 levels until the Company has shown sufficient improvement in indices' performance. Otter Tail proposes to maintain the performance standards at the 2013 levels as shown in **Table 1** below.

Table 1

Proposed 2019 Standards by CSC			
Work Center	**SAIDI**	**SAIFI**	**CAIDI**
Bemidji	70.64	1.26	56.06
Crookston	69.33	1.19	58.26
Fergus Falls	66.97	1.11	60.33
Milbank	75.49	1.82	41.48
Morris	55.78	1.01	55.23
Wahpeton	57.24	1.13	50.65
All MN Customers	**64.95**	**1.13**	**57.48**

V. CONCLUSION

Otter Tail appreciates the opportunity to provide this Safety, Reliability, and Service Quality Report for 2018, and requests Commission approval of our proposed reliability standards for 2019.

Date: April 1, 2019

Respectfully submitted,

By: /s/ WENDI OLSON

Wendi Olson
Regulatory Compliance Specialist
Otter Tail Power Company
215 South Cascade St., PO Box 496
Fergus Falls, MN 56537
(218) 739-8699

Otter Tail Power Company's

Safety, Reliability, and Service Quality Report for 2018

Proposed SAIFI, SAIDI, and CAIDI Reliability Standards for 2019

Including Additional Compliance Obligations

April 1, 2019

OTTER TAIL POWER COMPANY

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I. EXECUTIVE MANAGEMENT'S VIEW OF RELIABILITY

This section provides the view of Otter Tail's executive management towards reliability and customer satisfaction.

Otter Tail Power Company (Otter Tail or the Company) is committed to providing quality and reliable service for the rural communities we serve. Reliability at Otter Tail continues to be best summarized in the Company's mission statement:

"To produce and deliver electricity as reliably, economically, and environmentally responsibly as possible to the balanced benefit of customers, shareholders, and employees and to improve the quality of life in the areas in which we do business."

Otter Tail provides electricity to 422 communities and to rural areas in western Minnesota, northeastern South Dakota, and the eastern two-thirds of North Dakota. The average population of the communities we serve is approximately 630, and over one-half of the communities we serve have populations of fewer than 200. Only three of our communities have populations exceeding 10,000: Fergus Falls, Minnesota (pop. 13,138), Bemidji, Minnesota (pop. 13,431), and Jamestown, North Dakota (pop. 15,427). We operate nine Customer Service Centers (CSC) throughout our service territory. Otter Tail is committed to utilizing proactive efforts to communicate, investigate, and resolve reliability issues across our approximately 70,000 square-mile service territory. This is roughly the size of North Dakota.

The integrity of Otter Tail's entire transmission and distribution system is directly related to interruption frequency; thus, the accountability lies within our Asset Management area. Otter Tail's Asset Management area is accountable for the quality, availability and delivery of materials and engineering associated with providing electric service to Otter Tail customers. At Otter Tail, we employ a system of Key Performance Indicators (KPIs), for the purpose of providing additional focus on achievement in particular areas of our operations. Two of Asset Management's KPIs are reliability indices dealing with interruption frequency: the Momentary Average Interruption Frequency Index (MAIFI) and System Average Interruption Frequency Index (SAIFI).

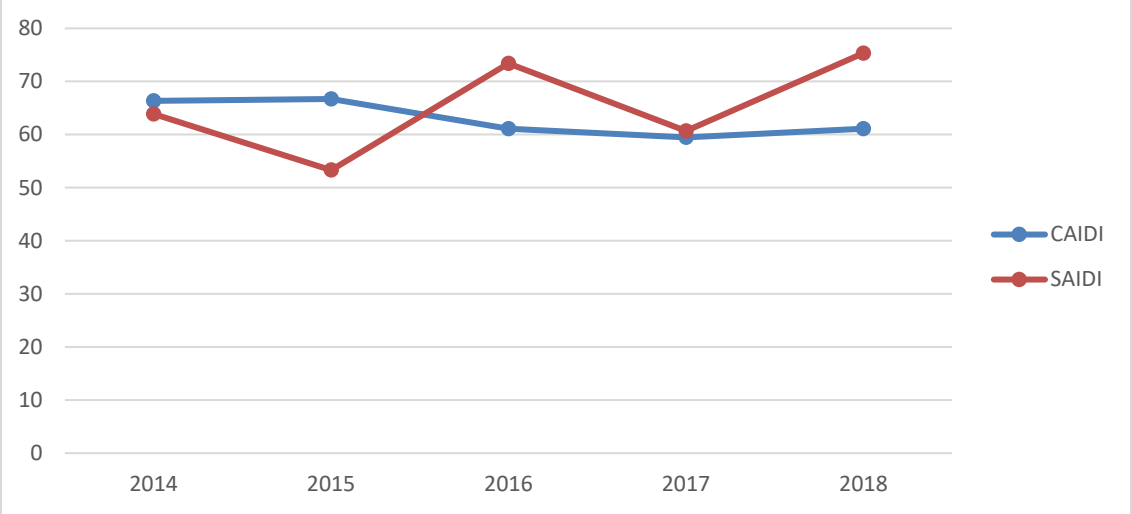
Otter Tail's Customer Service area is accountable for responding to all interruptions. Thus, Otter Tail's Customer Service area is accountable for the cost effective and efficient deployment of field personnel, trucks, and equipment as quickly and safely as possible, necessary for restoring service to customers when interruptions occur. One of the Customer Service area's KPIs is Customer Average Interruption Duration Index (CAIDI.) Additionally, the Reliability indices, SAIDI, SAIFI, CAIDI, and MAIFI are companywide KPI's. These indices are communicated and reviewed with all impacted employees, on a monthly basis, with the expectation that all employees remain cognizant of our company's reliability performance.

The Asset Management and Customer Service areas have a common goal, which is to improve the overall system reliability. Each area recognizes the overall system improvement cannot be accomplished without collaboratively working with the other area. Each area also recognizes system reliability improvements are based on cost effective decisions and overall system improvements over longer periods of time.

II. 2018 SUMMARY GRAPHS

As previously included Otter Tail provides a summary table that allows the reader to more easily assess the overall reliability of the system and identify the main factors that affect reliability. Figure 1 through **Figure 6** below provides a brief summary of Otter Tail's overall reliability and service quality for the years 2014 through 2018.

Figure 1 - Historic Minnesota SAIDI and CAIDI



Otter Tail MN Customers saw level performance in CAIDI and an increase in SAIDI for 2018 compared to 2017 results.

Figure 2 - Minnesota Historic SAIFI

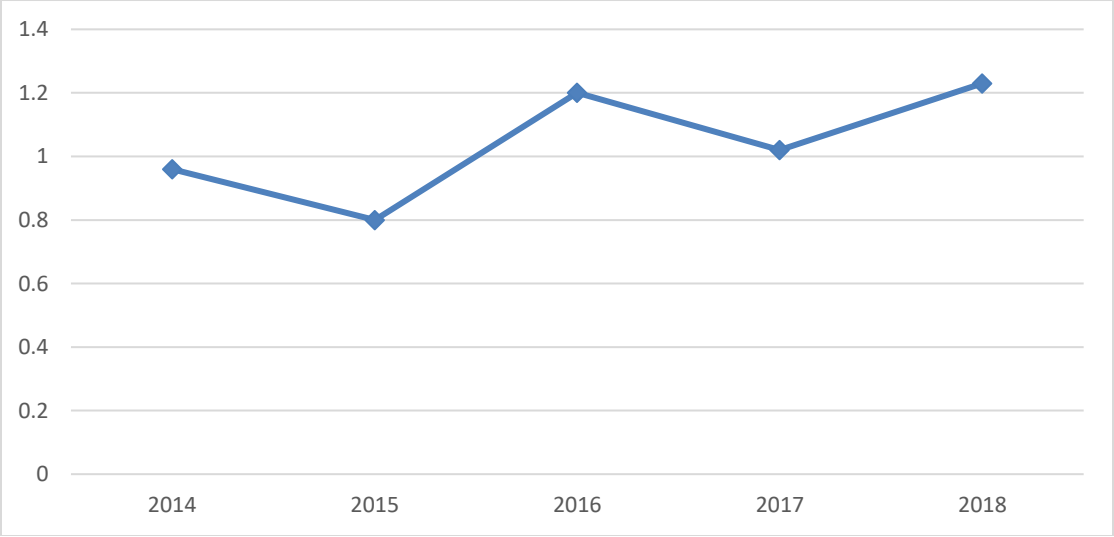


Figure 3 –Historic Expense of Major Critical System Infrastructure Items

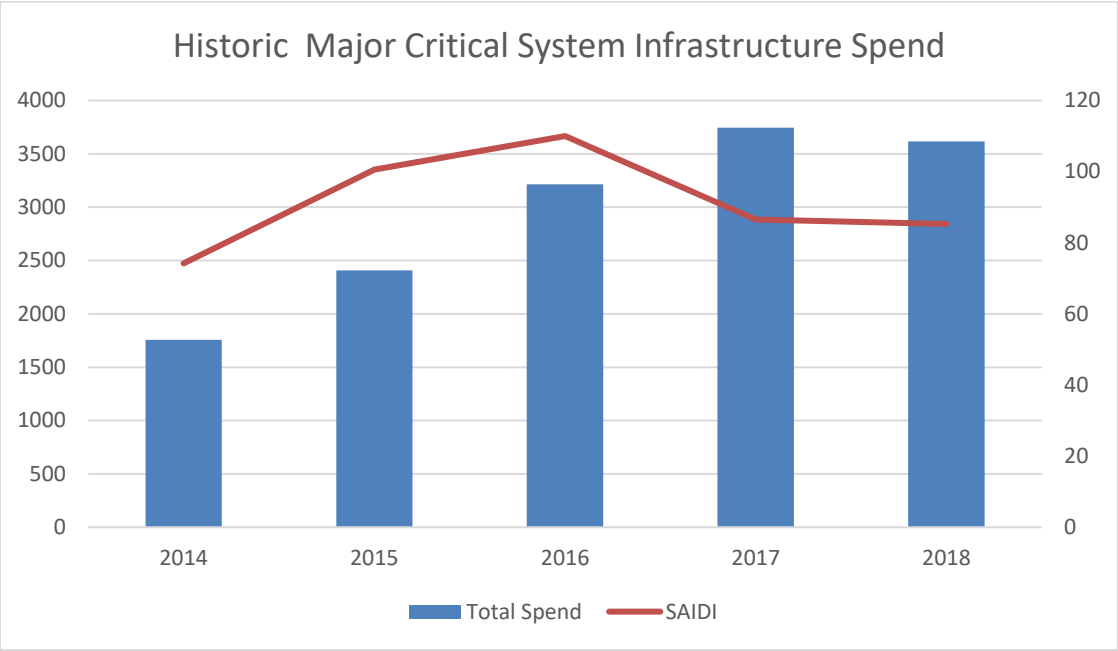


Figure 4 – Minnesota Historic MAIFI

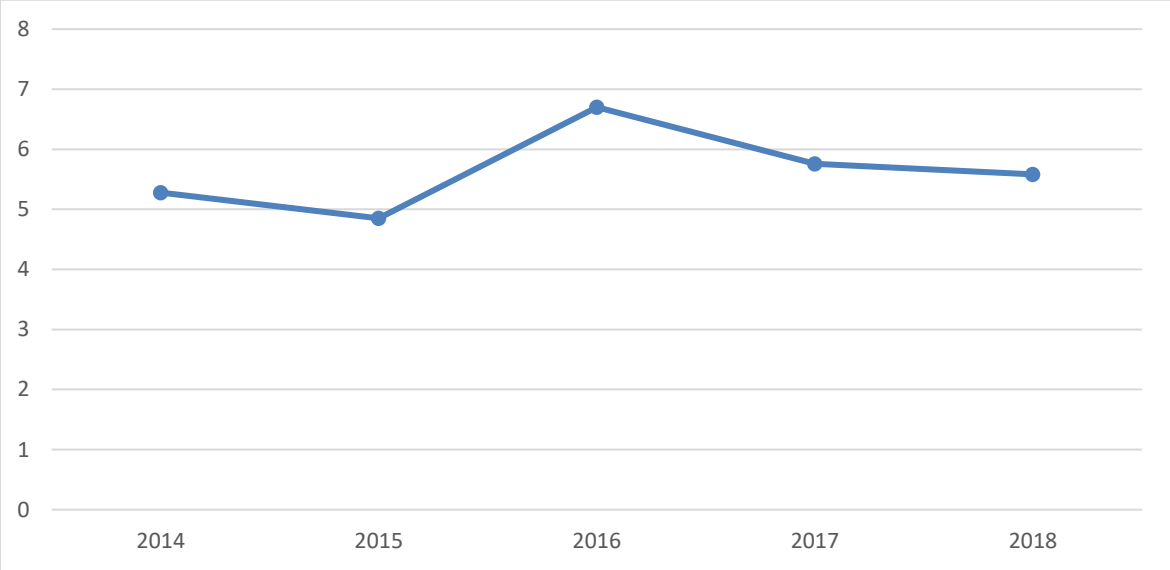


Table 1
MAIFI by Customer Service Center

CSC 2018	MAIFI
Bemidji	4.95
Crookston	5.14
Fergus Falls	5.18
Milbank	8.95
Morris	6.71
Wahpeton	7.57
MN Total	5.59

MAIFI is the momentary average interruption frequency index. It is an indication of the average number of momentary interruptions the average customer received over the course of a year, for a particular region. Otter Tail views MAIFI as a leading indicator for future SAIDI and thus tracks and analyzes line sections with excessive momentary interruptions for future capital improvements or possible vegetation management needs. The data for MAIFI calculations is gathered by our current Interruption Monitoring System, IMS. Data from the new system will be available for the 2019 reporting year. Overall, Otter Tail saw a slight reduction in 2018 results when compared to 2017.

Figure 5 – Full Time Lineworkers available for trouble calls and for the operation and maintenance of Minnesota distribution lines

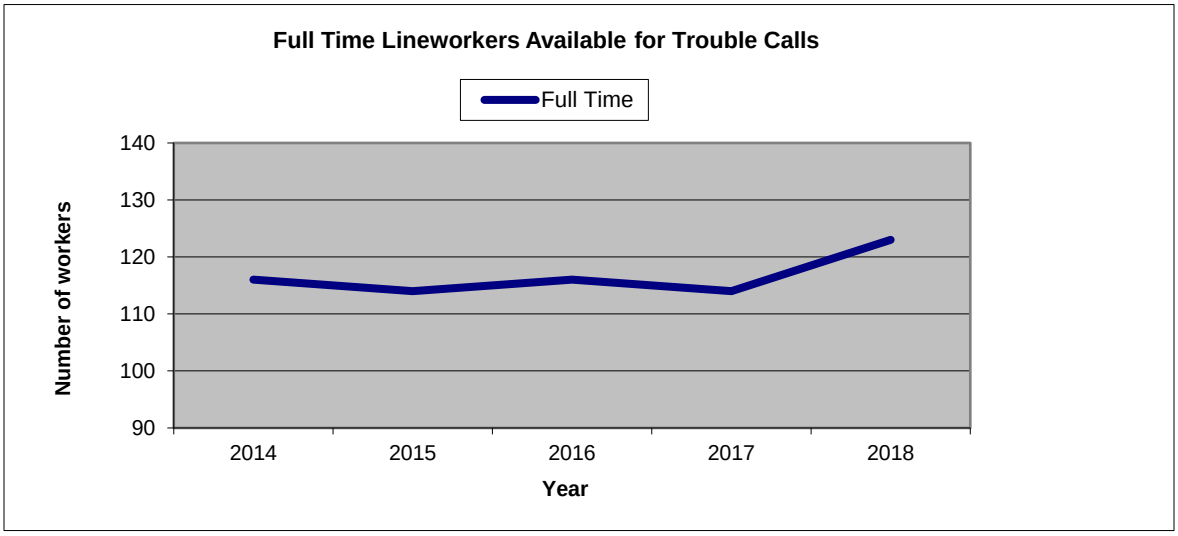
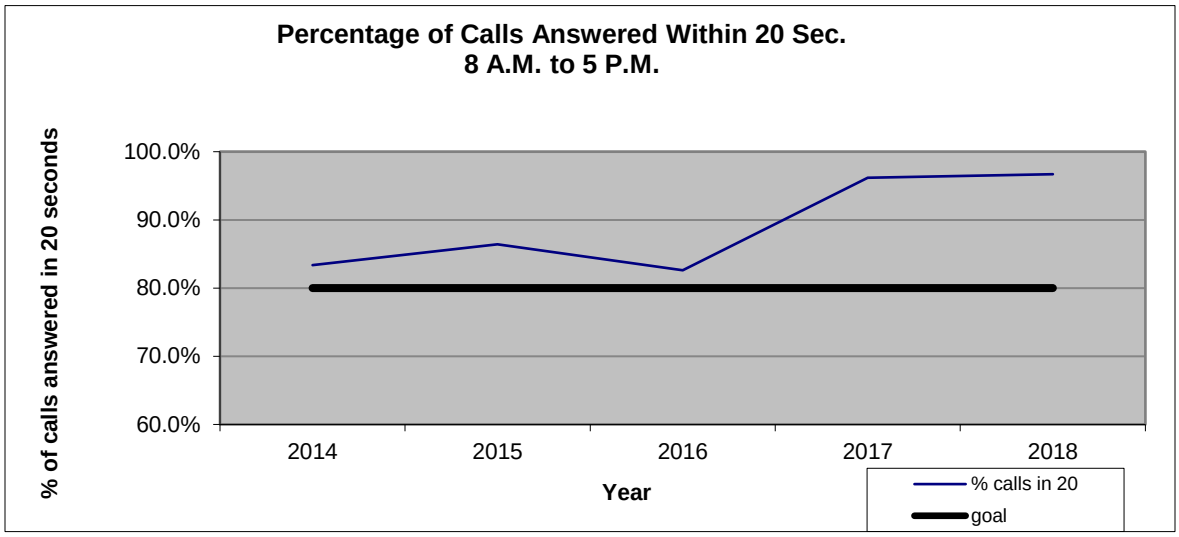


Figure 6 - Calls Answered within 20 Seconds



III. ANNUAL SAFETY REPORT 7826.0400

Pursuant to Minnesota Rule 7826.0400, ANNUAL SAFETY REPORT, each utility shall file a report on its safety performance during the last calendar year. This report shall include the following information.

A. Summary of all reports filed with the United States Occupational Safety and Health Administration and the Occupational Safety and Health Division of the Minnesota Department of Labor and Industry during the 2018 Calendar year.

Table 2

NUMBER OF CASES			
Total number of deaths	Total number of cases with days away from work	Total number of cases with job transfer or restriction	Total number of other recordable cases
0	1	2	14
NUMBER OF DAYS			
Total number of days of job transfer or restriction		Total number of days away from work	
152		6	

INJURY AND ILLNESS TYPES				
Injuries	Skin disorders	Respiratory conditions	Poisonings	All other illnesses
14	0	0	0	0

When an injury or illness involves one or more days away from work, you must record the injury or illness on the OSHA 300 Log with a check mark in the space for cases involving days away and an entry of the number of calendar days away from work in the number of days column. The number of cases with job transfers or restrictions safety metric employers determine how many workplace injuries and illnesses required employees to miss work, perform restricted work activities or transfer to another job within a calendar year. The number of other recordable cases describes the work-related injury of illness that does not involve death, days away from work, or days of restricted work or job transfer, and where the employee receives medical treatment beyond first aid. The total number of days away from work shows the total number of calendar days away from work for all work-related injuries and illnesses.

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 electric system failures and all remedial action taken as a result of any injuries or property damage described, are shown in Table 3.

Table 3

ANNUAL SAFETY REPORT				
Date	**Cause**	**Type**	**Action Taken**	**Expense**
7/27/2018	UG Fault	Property Damage	Paid for damages	$100
There were no instances of personal injury due to system failures in 2018.				

IV. RELIABILITY REPORTING REQUIREMENTS 7826.0500

Subpart 1. Annual reporting requirements. On or before April 1 of each year, each utility shall file on its reliability performance during the last calendar year.

A – D. REPORT OF OTTER TAIL'S SAIDI, SAIFI, AND CAIDI FOR 2018 AND STORM NORMALIZATION OF RELIABILITY DATA

Minnesota Rule 7826.0500, Subparts 1a, 1b, 1c, and 1d requires the utility to file a report on its SAIDI, SAIFI and CAIDI for the calendar year, by work center and for its assigned service area as a whole. Additionally, this rule requires the utility to provide an explanation of how the utility normalized its reliability data to account for major storms.

In 2009, Otter Tail worked with Sensus, Otter Tail's current Interruption Monitoring System (IMS) provider and the underlying software for the system, to make necessary changes to implement the IEEE 2.5 beta method process to normalize reliability data. Otter Tail's 2.5 Beta process is based on the following assumptions:

- Sensus calculates annual system T_{med} (SAIDI/Day threshold) based on the previous five years of data.
- The system T_{med} is utilized to run our indices for Minnesota and individual Minnesota Customer Service Centers (CSCs).

For 2018 data, the 2.5 beta parameter assumptions were as follows:

2.5 Beta Parameters:

Alpha	Beta	Major Event Day
-2.096281864	1.856049299	12.728472122

After applying 2.5 Beta Parameters for 2018, one day met the criteria to be considered a Major Event Day. That day was June 29, 2018. The Minnesota Public Utilities Commission's (Commission) **December 12, 2014 Order in Docket E017/M-14-279**, required Otter Tail report on the major causes for the major event days.

> On June 29, 2018, severe weather resulted in widespread outages for many of our North Dakota and Minnesota customers. Outages began shortly after midnight on June 29 in western North Dakota and continued through northern Minnesota as the storm moved north and east. The storm systems carried heavy rain, hail, and strong winds that damaged trees and downed poles. Over 20 minutes of system SAIDI would have accumulated due to this event had it not been storm normalized.

Table 4 shows Otter Tail's 2018 SAIFI, CAIDI and SAIDI results based on the IEEE 2.5 Beta Method for each CSC and the entire Minnesota system. The goals used for 2018 are the standards that were established in 2013, consistent with the previous five years, as set by the Commissions until sufficient improvement in results are realized. Based on Otter Tail's 2018 standards **we met 33 percent of our CSC targets in 2018, compared to 56 percent in 2017.**

Table 4

2.5 Beta

CSC	2018	SAIFI	CAIDI	SAIDI
Bemidji	**OES Goal**	1.26	56.06	70.64
	Actual	1.14	67.86	77.35
Crookston	**OES Goal**	1.19	58.26	69.33
	Actual	1.79	41.7	74.75
Fergus Falls	**OES Goal**	1.11	60.33	66.97
	Actual	0.81	71.35	57.65
Milbank	**OES Goal**	1.82	41.48	75.49
	Actual	0.74	94.68	70.35
Morris	**OES Goal**	1.01	55.23	55.78
	Actual	1.41	62.29	88.09
Wahpeton	**OES Goal**	1.13	50.65	57.24
	Actual	3.07	65.67	201.38
MN Total	**OES Goal**	1.13	57.48	64.95
	Actual	1.23	61.12	75.33

Table 4a shows Otter Tail's 2018 SAIFI, CAIDI and SAIDI non-normalized results for each CSC and the entire Minnesota system. i.e. June 29th, 2018 is included.

Table 4a

Non-Normalized

CSC	2018	SAIFI	CAIDI	SAIDI
Bemidji	**OES Goal**	1.26	56.06	70.64
	Actual	1.38	92.44	127.27
Crookston	**OES Goal**	1.19	58.26	69.33
	Actual	1.95	42.98	83.66
Fergus Falls	**OES Goal**	1.11	60.33	66.97
	Actual	0.81	71.35	57.65
Milbank	**OES Goal**	1.82	41.48	75.49
	Actual	0.74	94.68	70.35
Morris	**OES Goal**	1.01	55.23	55.78
	Actual	1.41	62.29	88.09
Wahpeton	**OES Goal**	1.13	50.65	57.24
	Actual	3.07	65.67	201.38
MN Total	**OES Goal**	1.13	57.48	64.95
	Actual	1.31	67.7	86.41

Below Otter Tail provides a description of events that had the greatest impact on normalized SAIDI, SAIFI and CAIDI indices in 2018.

Otter Tail's 2018 SAIDI standards – In 2018, the Bemidji, Crookston, Morris and Wahpeton Customer Service Centers failed to meet the 2018 SAIDI reliability standards.

Bemidji CSC: The Bemidji CSC experienced 77 sustained interruptions in 2018, resulting in a SAIDI of 77.35 minutes compared to the goal of 70.64. The greatest impact to the SAIDI results in the Bemidji CSC was an interruption lasting 2 hours and 45 minutes on July 8th due to equipment failure. At 11:20 PM, a distribution poly insulator burned up on the Bemidji 25th St. – East OCR #55 Feeder impacting 984 customers. The fault caused the line to fall to the ground, extending the repair time, adding to the long duration.

Crookston CSC: The Crookston CSC experienced 105 sustained interruptions in 2018, resulting in a SAIDI of 74.75 minutes compared to the goal of 69.33. The greatest impact to the SAIDI results in the Crookston CSC was an interruption lasting 5 hours and 39 minutes impacting 264 customers. On October 25th, an insulator failed, resulting in a wood pole fire on the Holt Junction – Main Feeder. The resulting fire was within the Holt Junction substation. Otter Tail's normal responder was on vacation and backup service personnel had to travel from a further distance which extended the restoration duration.

Morris CSC: The Morris CSC experienced 132 sustained interruptions in 2018, resulting in a SAIDI of 88.09 minutes compared to the goal of 55.78. The greatest impact to the SAIDI results in the Morris CSC was an interruption lasting 7 hours and 30 minutes impacting 287 customers. On March 5th, heavy wet snow caused several interruptions in the Morris CSC region. Ice formed on the Green Valley Xcel – OCR 585 Feeder causing the lines to gallop and eventually one line fell to the ground. Crews handling several restorations added to the long duration.

Wahpeton CSC: The Wahpeton CSC experienced 16 sustained interruptions in 2018, resulting in a SAIDI of 201.38 minutes compared to the goal of 57.24. There are only six feeders serving Minnesota customer out of this service center. The greatest impact to the SAIDI results in the Wahpeton CSC was an interruption occurring on May 1st, due to a major storm. This event caused damage to the Wheaton – South and East Feeder, impacting 311 customers. Lightning struck a pole causing a fire which the fire department was called to put out.

Otter Tail 2018 SAIFI standards –The Crookston, Morris, and Wahpeton Customer Service Centers failed to meet the 2018 SAIFI reliability standards.

Crookston CSC: The Crookston CSC experienced 105 sustained interruptions in 2018, resulting in a SAIFI of 1.79 interruptions compared to a goal of 1.19.

Morris CSC: The Morris CSC experienced 132 sustained interruptions in 2018, resulting in a SAIFI of 1.41 interruptions compared to a goal of 1.01.

Wahpeton CSC: The Wahpeton CSC experienced 16 sustained interruptions in 2018, resulting in a SAIFI of 3.07 interruptions compared to a goal of 1.13.

Otter Tail 2018 CAIDI standards – The Bemidji, Fergus Falls, Milbank, Morris, and Wahpeton Customer Service Centers failed to meet the 2018 CAIDI reliability standards.

Bemidji CSC: The Bemidji CSC experienced 75 sustained interruptions in 2018, resulting in a CAIDI of 67.86 minutes compared to a goal of 56.06 minutes. Twenty-six of these interruptions had durations of greater than the goal of 56.06 minutes. The most impactful feeder interruptions occurred on September 11th due to the same event. On that day, a 115KV planned outage took place causing two long interruptions at Clearbrook Lakehead Pipe – Main Feeder and Clearbrook MN Pipeline – Main Feeder impacting three customers each for 9 hours and 35 minutes and 9 hours and 28 minutes respectively. The purpose of the outage was to complete ongoing work at our Bagley Switching Station, completing the cutover process.

Fergus Falls CSC: The Fergus Falls CSC experienced 79 sustained interruptions in 2018, resulting in a CAIDI of 71.35 minutes compared to a goal of 60.33 minutes. Thirty-five of these interruptions had durations of greater than the goal of 60.33 minutes. The most impactful feeder interruptions occurred on July 19th and September 12th. On July 19th, a squirrel got into the Erdahl Substation and caused damage to the high side fuse disconnects and the low side bus work. This resulted in a 3 hour and 57 minute interruption on our Erdahl - Main Feeder, impacting 446 customers. Animal deterrents have been installed on all structures in this substation since this event. On September 12th, we took a planned outage for final substation cut in onto our new 41.6KV line that was constructed due to a county road move. This event caused a 4 hour and 48 minute interruption on our Foxhome – Main Feeder, impacting 90 customers.

Milbank CSC: The Milbank CSC experienced six sustained interruptions in 2018, resulting in a CAIDI of 94.68 minutes compared to a goal of 41.48 minutes. Milbank CSC has only five feeders feeding MN customers. All six of these interruptions had durations of greater than the goal of 41.48 minutes. The three most impactful feeder interruptions occurred on May 1st due to the same event. On that day, a large storm system with strong winds caused a 2 hour and 20 minute interruption to the Marietta – Marietta Feeder, Marietta – Farms Feeder, and the Nassau – Main Feeder. This storm system and high winds caused a broken insulator on the 41.6KV transmission line feeding these substations impacting a total of 269 customers fed off the three feeders.

Morris CSC: The Morris CSC experienced 132 sustained interruptions in 2018, resulting in a CAIDI of 62.29 minutes compared to a goal of 55.23 minutes. Forty-one of these interruptions had durations of greater than the goal of 55.23 minutes. The most impactful interruptions occurred on March 5th and July 11th. As described in the SAIDI analysis, on March 5th, heavy wet snow and ice caused the Green Valley Xcel – OCR 585 Feeder line to fall to the ground, resulting in an interruption lasting 7 hours and 30 minutes impacting 287 customers. On July 11th, a transformer failed in the Cyrus Substation resulting in in a 9 hour and 25 minute interruption, impacting 97 customers on the Cyrus – Main Feeder.

Wahpeton CSC: The Wahpeton CSC experienced 16 sustained interruptions in 2018, resulting in a CAIDI of 65.67 minutes compared to a goal of 50.65 minutes. Ten of these interruptions had durations of greater than the goal of 50.65 minutes. The most impactful interruption occurred on May 1st. As described in the SAIDI analysis, lightning hit a pole causing a fire on the Wheaton – South and East Feeder, impacting 311 customers.

Reliability Standard Summary

When compared to 2017, Otter Tail's 2018 overall Minnesota reliability performance realized a slight decline in SAIFI, CAIDI, and SAIDI. MAIFI realized a slight improvement year to year.

Reliable service continues to be one of Otter Tail's top priorities and we are cognizant that ongoing improvements in reliability will continue to happen over time and must be done cost effectively. We believe the continued maturity of our current processes and the application of new technologies and tools will provide good results.

Table 5 provides a summary of the different types of interruption causes that affect overall system reliability. As of note, migration into the new IMS has taken place in 2018, interruption cause data details for 2018 lacked the detail and granularity for optimum post analysis. Otter Tail expects increased capabilities in this area through implementation of the new system.

Table 5
2018 MN Sustained Interruption Summary by CSC and cause

	Bemidji	Crookston	Fergus Falls	Milbank	Morris	Wahpeton	Work Center Totals
Bulk Power Loss							0
Transmission		12	27		4		43
Flood							0
Animal	1	1			2		4
Vehicle Accident	3				2		5
Equipment Failure	28	18	10		23		79
Vandalism							0
Trees	4		1		3		8
Overload							0
Human error		2			2		4
Underground	2	2					4
Bird	1	18	2				21
Arrestor/Insulator failure			15		16		31
Fuse	1						1
weather related	30	38	6	6	51	1	132
investigated and unknown			3				3
Other	2	1	1		4		8
Unknown	5	13	14		25	15	72

E. ACTION PLAN FOR REMEDYING ANY FAILURE TO COMPLY WITH RELIABILITY STANDARDS

Minnesota Rule 7826.0500, Subpart 1e, **requires utilities to file an action plan for remedying any failure to comply with reliability standards set forth in part 7826.0600 or an explanation as to why non-compliance was unavoidable under the circumstances.**

Overall, Otter Tail Minnesota Customers experienced 484 (415 storm normalized) sustained interruptions in 2018. Otter Tail provides the following information regarding its 2018 results.

In compliance with the Commission's **December 20, 2012 Order in Docket No. E017/M-12-325**, Otter Tail submitted a compliance filing on February 4, 2013 describing Otter Tail's action plans to address not meeting the 2011 reliability standards set by the Commission. In that filing, Otter Tail described several enhanced or new processes adopted by the Company to improve system reliability performance. The following is an update of our action plan:

1. **Reliability Improvement Initiative Team Meetings:** Otter Tail's Reliability Improvement Initiative cross functional team continues to meet monthly for a comprehensive overview of our system's reliability. This process has provided increased awareness, focus and attention to reliability related issues through the prioritization of resources.

2. **Electronic Tracking Process for Transmission Patrol Reports and Maintenance Activities:** Otter Tail continues to improve electronic tracking of internal reports and have integrated the process into our GIS. This allows the Company to more effectively schedule and manage maintenance activities based on historic and current maintenance data. This lends itself for a more efficient prioritization of resources.

3. **Lightning Tracking System:** Otter Tail implemented a lightning tracking system six years ago. It tracks lightning activity within Otter Tail's service territory. This tool has been beneficial in identifying remote areas hit by lightning, assisting in follow-up patrols and inspections to identify damaged equipment. In 2019, progress will continue towards the integration of the lightning data with our GIS providing strike location for patrols and post event analysis.

4. **GIS Data Integration:** Otter Tail continues the integration of critical system data into its GIS. Underground fault data, patrol information, SEL distance relay data, lightning strike location data, and pole inspection data will all be integrated into GIS providing an optimized approach to reliability related activities in the future.

5. **Fault Indicator Installations at Transmission Line Junctions:** Otter Tail continues to install and utilize fault indicators on transmission line junctions (line splits). Otter Tail will continue to monitor and investigate the improvements this equipment provides in our abilities to identify fault location detection.

6. **Installation of Remote Real-Time Voltage, Current, and Power Monitors**: In 2014 Otter Tail began installing remote real-time power monitors in the field to assist with

investigating interruption events and power quality issues. Data provided is real-time and displayed via a web browser. Continued deployment of this equipment has improved Otter Tail's efforts in identifying problems and issues in the field.

Otter Tail believes this action plan will provide continued contribution towards cost-effective improvement of the Company's overall system reliability. Overall system improvements will be realized over longer periods of time. These improvements will come through new technology, improved efficiencies, disciplined primary cause investigation and analysis, situational awareness, and attention to overall cross-functional accountabilities.

F. INTERRUPTION OF BULK POWER SUPPLY FACILITY

Pursuant to Minnesota Rule 7826.0500, Subpart 1f, 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.

For the 2018 calendar year Otter Tail reports that there was one sustained interruption to a Minnesota Bulk Power Supply Facility. On August 13th at 2:00 PM, the 115KV transmission line between Ortonville, MN and Fairmount, ND was interrupted due to a phase to ground fault. This caused a 14 minute interruption to Minnesota customers served off this line.

G. REPORTING MAJOR SERVICE INTERRUPTIONS

Minnesota Rule 7826.0500, Subpart 1g, requires utilities to file a copy of each report filed under part 7826.0700, reporting major service interruptions.

Pursuant to Minnesota Rule 7826.0500, Subpart 1g, Otter Tail provides as Attachment 1, a copy of each report filed under part 7826.0700, reporting major service interruptions.

H. CIRCUIT INTERRUPTION DATA

Minnesota Rule 7826.0500, Subparts 1h, requires utilities, to the extent technically feasible, to file 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.

In compliance with this rule, **Table 6** shows the worst performing circuit for each of Otter Tail's six CSC's. For the purpose of identifying the worst performing circuit, we defined a circuit as a distribution feeder and the criterion that was used to identify the worst performing circuit was total customer minutes. **Table 7** shows the interruptions that contributed to the feeders being the worst performing circuit for each CSC in 2018.

Table 6
2018 MN Worst Performing Feeders

Service Center	Substation Name	Feeder Description	Customer Count	Total Sustained Customer Minutes	SAIFI	CAIDI	SAIDI
BEMIDJI	BEMIDJI 25TH ST	EAST OCR #55 (31585)	964	162228.8	1	164.87	164.87
CROOKSTON	CROOKSTON PARK VIEW	WEST EAST AND SOUTH OCR 1 (31592)	1096	106768.67	2	48.71	97.42
FERGUS FALLS	ERDAHL	MAIN FEEDER (32283)	446	299028.13	4	167.62	670.47
MILBANK	MARIETTA	MARIETTA (33017)	151	28808.28	2	95.39	190.78
MORRIS	GREEN VALLEY XCEL	OCR 585 (32320)	287	146532.63	2	255.28	510.57
WAHPETON	WHEATON	SOUTH AND EAST FEEDER (27003)	311	122668.77	4	98.61	394.43

Table 7
2018 MN Worst Performing Feeders Details

Interruption Date	State	Service Center	Substation	Feeder Name	Cause	Duration	Customer Count	Customer Minutes
7/8/2018 23:11	MN	BEMIDJI	BEMIDJI 25TH ST	EAST OCR #55 (31585)	Equipment Failure	2:44:52	984	162,228.80
5/30/2018 7:48	MN	CROOKSTON	CROOKSTON PARK VIEW	WEST EAST AND SOUTH OCR 1 (31592)	Bird	0:21:50	1096	23,929.33
4/1/2018 5:52	MN	CROOKSTON	CROOKSTON PARK VIEW	WEST EAST AND SOUTH OCR 1 (31592)	Equipment Failure	1:15:35	1096	82,839.33
12/9/2018 12:36	MN	FERGUS FALLS	ERDAHL	MAIN FEEDER (32283)	Other	2:47:59	446	74,920.57
12/2/2018 21:09	MN	FERGUS FALLS	ERDAHL	MAIN FEEDER (32283)	Arrester/Insulator failure	1:20:10	446	35,754.33
8/7/2018 10:17	MN	FERGUS FALLS	ERDAHL	MAIN FEEDER (32283)	Equipment Failure	3:04:52	446	82,450.53
7/19/2018 15:33	MN	FERGUS FALLS	ERDAHL	MAIN FEEDER (32283)	Equipment Failure	3:57:27	446	105,902.70
5/1/2018 0:06	MN	MILBANK	MARIETTA	MARIETTA (33017)	Weather - includes: rain, lightning, wind, storm, etc.	2:19:56	151	21,129.93
3/5/2018 12:15	MN	MILBANK	MARIETTA	MARIETTA (33017)	Weather - includes: rain, lightning, wind, storm, etc.	0:50:51	151	7,678.35
3/5/2018 14:40	MN	MORRIS	GREEN VALLEY XCEL	OCR 585 (32320)	Weather - includes: rain, lightning, wind, storm, etc.	7:30:01	287	129,154.78
3/5/2018 13:26	MN	MORRIS	GREEN VALLEY XCEL	OCR 585 (32320)	Weather - includes: rain, lightning, wind, storm, etc.	1:00:33	287	17,377.85
11/3/2018 20:19	MN	WAHPETON	WHEATON	SOUTH AND EAST FEEDER (27003)	Unknown	0:16:49	311	5,229.98
8/13/2018 14:00	MN	WAHPETON	WHEATON	SOUTH AND EAST FEEDER (27003)	Unknown	0:14:00	311	4,354.00
5/8/2018 11:05	MN	WAHPETON	WHEATON	SOUTH AND EAST FEEDER (27003)	Unknown	1:59:59	311	37,314.82
5/1/2018 2:07	MN	WAHPETON	WHEATON	SOUTH AND EAST FEEDER (27003)	Weather - includes: rain, lightning, wind, storm, etc.	4:03:38	311	75,769.97

Bemidji CSC: The East OCR #55 Feeder fed from the Bemidji 25th St. Substation was the worst performing feeder in 2018 for the Bemidji CSC. This feeder experienced one sustained interruption, impacting 984 customers. On July 8th, 2018 immediately after a major storm in the area, a set of distribution insulators failed and burned, resulting in the conductor to fall to the ground, resulting in a 2 hour and 45 minute interruption. Following insulator replacement and repairs to the conductor, a thorough patrol of the entire feeder was conducted with no other issues identified.

Crookston CSC: The West East and South OCR 1 Feeder fed from the Crookston Park View Substation was the worst performing feeder in 2018 for the Crookston CSC. This feeder experienced two sustained interruptions due to two separate events, impacting 1096 customers. On April 1st, 2018, a transmission arrestor failed resulting in a 1 hour and 16 minute interruption. All infrared arrestors in the area have been infrared tested and replaced as necessary. On May 30th, 2018, a duck contacted the high side bus in the 115KV substation causing the differential to lockout on the 41.6KV circuit, resulting in a 22 minute interruption.

There have been no further issues or interruptions on this line section since these two events. The line will continue to be monitored to ensure improved performance in the future.

Fergus Falls CSC: The Main Feeder fed out of the Erdahl Substation was the worst performing feeder in 2018 for the Fergus Falls CSC. This feeder experienced four sustained interruptions, impacting 446 customers, due to four separate events. On July 19th, 2018, an animal caused damage in the substation creating the need to replace the disconnect switches and the high side substation fuses resulting in a 3 hour and 57 minute interruption. On August 7th, 2018, a substation transformer failed and required replacement, resulting in a 3 hour and 5 minute interruption. On December 2nd, 2018, a pole top insulator failed causing a pole fire on the 41.6 KV transmission line. This event required transmission switching so that the structure could be replaced and resulted in a 1 hour and 20 minute interruption. On December 9th, 2018, an animal caused damage to bus work insulation within the substation resulting in a 2 hour and 48 minute interruption. Following this event, animal deterrent guards were investigated, procured, and installed in strategic locations within the substation.

Investigations into proactive maintenance activities continues to be conducted to improve this feeder's performance in the future.

Milbank CSC: The Marietta Feeder fed out of the Marietta Substation was the worst performing feeder in 2018 (also in 2017) for the Milbank CSC. The feeder experienced two sustained interruptions, impacting 151 customers, due to two separate weather-related events. On March 5th, 2018, bad weather and high winds cause insulator cross arm failures on the 41.6KV transmission line feeding the Wheaton Substation. On May 1st, 2018, as described in the previous CAIDI analysis for the Milbank CSC, strong winds broke an insulator on the 41.6KV transmission line feeding the Wheaton Substation, resulting in a 2 hour and 20 minute interruption impacting 151 customers.

There have been no further issues or interruptions on this line section since these two 2018 events. With both 2018 interruptions on this feeder due to the 41.6KV transmission line section between LaBolt and Albee, Otter Tail will continue studying upgrade options for this span of line to ensure the feeder's performance improves in the future.

Morris CSC: The OCR 585 Feeder fed from the Green Valley Xcel Substation was the worst performing feeder in 2018 for the Morris CSC. This feeder experienced two sustained interruptions, impacting 287 customers, due to one weather event. On March 5th, 2018, heavy wet snow caused galloping lines causing a blown fuse and resulting in a 1 hour interruption. Later that afternoon, additional snow and ice accumulation caused the T2 line to fall to the ground resulting in a 7 hour and 30 minute interruption. Restoration time for this event took longer as crews were busy repairing other downed lines in the immediate area.

There have been no further issues or interruptions on this line section since these two events. The line will continue to be monitored to ensure improved performance in the future.

Wahpeton CSC: The South and East Feeder fed from the Wheaton substation was the worst performing feeder in 2018 for the Wahpeton CSC. This feeder experienced four sustained interruptions, impacting 311 customers, due to four separate events. On May 1st, 2018, lightning struck the top of a distribution pole causing a pole top fire. Power had to be disconnected so the fire department could extinguish the fire resulting in a 4 hour and 4 minute interruption. On May 8th, 2018, an insulator failed causing the top phase to fall into the lines below resulting in a 2 hour interruption. On August 13th, 2018, there was a phase to ground fault on the 115KV transmission line 14.2 miles from Ortonville, resulting in a 14 minute interruption. System Operations closed a normally open motor operated switch at Fairmount restoring power to the Wheaton community. On November 11th, 2018, a distribution cut out failed causing a cross arm and pole to catch fire and a distribution transformer to fall to the ground resulting in a 17 minute interruption. This line section has been patrolled several times and additional proactive repairs made since last fall.

There have been no further issues or interruptions on this line section since these four events. The line will continue to be monitored to ensure improved performance in the future.

I. REPORT OF NOMINAL ELECTRIC SERVICE VOLTAGES

Minnesota Rule 7826.0500, Subpart 1i, requires that utilities shall file a report providing data on all known instances in which nominal electric service voltages on the utility's side of the meter did not meet the stands of the American National Standards Institute for nominal system voltages greater or less than voltage range B.

Otter Tail provides, in **Table 8** below, the feeders and number of occurrences where the voltage fell outside the ANSI voltage range B. Most of the feeders, with numerous occurrences, are feeders with a single large customer that has a very large load and are mostly pipelines.

Table 8
Feeders and Number of Occurrences – Voltage fell outside the ANSI Voltage Range

Unit ID	CSC	Feeder	Mid UV Count	Low OV Count
26384	BEMIDJI	MAIN FEEDER	0	186
26999	BEMIDJI	MAIN FEEDER	0	496
27015	MORRIS	EAST FEEDER (2)	0	5
27016	MORRIS	WEST FEEDER (1)	0	6
27075	BEMIDJI	MAIN FEEDER	0	495
29009	MORRIS	NORTHWEST FEEDER	0	1
31568	BEMIDJI	LBR MILL FEEDER	0	1
31575	MORRIS	EAST FEEDER	0	2
31586	BEMIDJI	DOWNTOWN OCR #75	0	2
31598	CROOKSTON	MAIN FEEDER	0	433
32130	CROOKSTON	MAIN FEEDER	0	220
32131	CROOKSTON	NORTH OCR 1	0	2
32137	CROOKSTON	MAIN FEEDER	0	158
32154	CROOKSTON	MAIN	1	0
32183	CROOKSTON	MAIN FEEDER	0	755
32194	Bemidji	MAIN FEEDER	5	0
32210	CROOKSTON	MAIN FEEDER	0	601
32243	CROOKSTON	MAIN FEEDER	0	1
32249	MORRIS	MILROY 525	1	0
32264	MORRIS	MAIN FEEDER	0	1
32272	FERGUS FALLS	#4-OCR TUFFYS	0	3
32286	BEMIDJI	MAIN FEEDER	0	2
32304	FERGUS FALLS	MAIN FEEDER	0	1
32307	FERGUS FALLS	MAIN FEEDER	0	1
32308	FERGUS FALLS	NORTH FEEDER	0	30
32315	FERGUS FALLS	EAST FEEDER	0	7
32316	FERGUS FALLS	NORTH FEEDER	0	10
32317	FERGUS FALLS	SOUTH FEEDER	0	11
32320	MORRIS	OCR 585	1	0
32322	MORRIS	MARSHALL OCR 585, OCR 495	1	0
32942	MORRIS	EAST FEEDER	0	2
32952	MORRIS	MAIN FEEDER	0	1
32977	MORRIS	MAIN FEEDER	0	5
34334	CROOKSTON	MAIN FEEDER	0	1
34352	CROOKSTON	SOUTH OCR 2	0	59
34356	BEMIDJI	MAIN FEEDER	0	268

J. STAFFING LEVELS AT EACH WORK CENTER

Minnesota Rule 7826.0500, Reliability Reporting Requirements, Subpart 1j, requires utilities to file a report providing 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.

In compliance with this rule, Otter Tail reports staffing levels by CSC 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. The staffing levels of Otter Tail's Minnesota CSCs as of December 31, 2018 are shown in **Table 9** below.

Table 9

	Department	Type	Total
	Bemidji	Field Office	16 1
	Bemidji Total		17
	Crookston	Field Office	17 1
	Crookston Total		18
	Delivery Maintenance*	Field Office	11 1
	Delivery Maintenance Total		12
	Fergus Falls	Field Office	21 1
	Fergus Falls Total		22
	Milbank**	Field Office	21 2
	Milbank Total		23
	Morris	Field Office	17 1
	Morris Total		18
	Operations Support	Field Office	4 1
	Operations Support Total		5
	Wahpeton***	Field Office	16 1
	Wahpeton Total		17
	Customer Care & Relations****		30
12/31/2018 Total			**162**

*Delivery Maintenance is a department with employees that work in substations and with substation related equipment. During trouble, they are dispatched to do switching and other work associated with substation equipment.

**The Milbank CSC serves customers in both Minnesota and South Dakota and the number of employees indicated represents all employees located in the CSC.

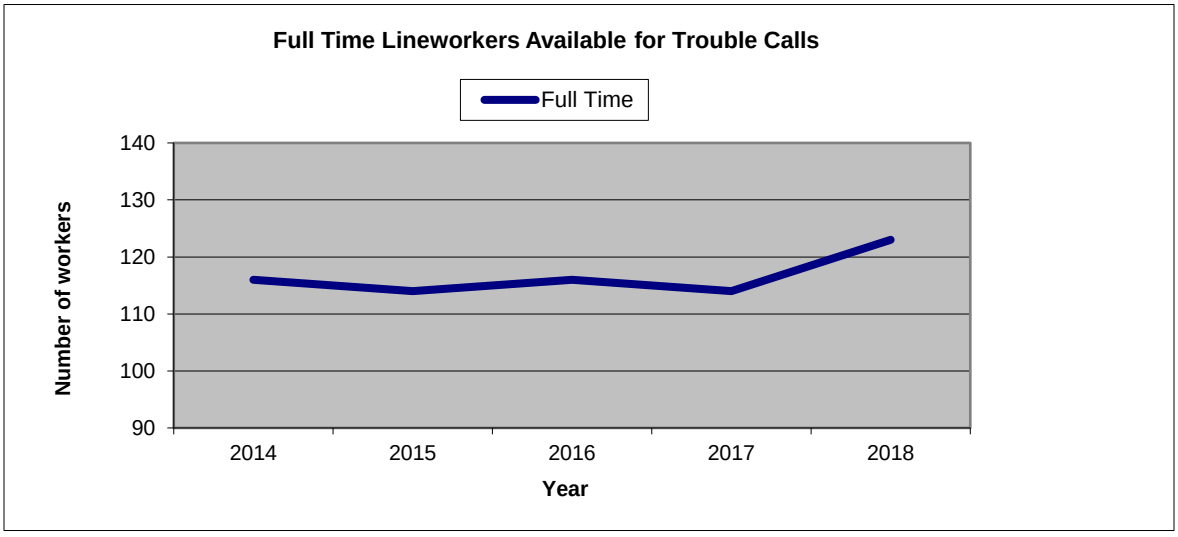
***Operations Support is based in Fergus Falls and the field employees are dispatched to assist CSC's in need throughout the entire system. The office employees coordinate resources.

***The Wahpeton CSC serves customers in Minnesota, North Dakota, and South Dakota and the number of employees indicated represents all employees located in the CSC.

**** Customer Care and Relations is the office staff that is made up of Customer Service Representatives, Lead Customer Service Representatives and Customer Service Management that are located in Customer Service Centers throughout our service territory. In 2015, we reorganized the office staff into one department. Since Otter Tail operates a Virtual Call Center, all of the office staff located throughout the territory are accountable for answering outage calls in all states. The employee count for Customer Care and Relations is 30.

Figure 7 below depicts by year the number of full-time line workers available for trouble and for the operation and maintenance of distribution lines. Otter Tail also has a reliability engineer who supports system reliability related functions. This individual is not included in the above staffing level information. Additionally, Otter Tail has engineers in its Asset Management area who, due to the nature of their roles, support reliability on a daily, weekly, monthly, and annual basis.

Figure 7



K. OTHER INFORMATION RELEVANT IN EVALUATING RELIABILITY PERFORMANCE

Minnesota Rule 7826.0500, Subpart 1k, **requires utilities to file any other information the utility considers relevant in evaluating its reliability performance over the calendar year.**

Otter Tail fully implemented an Interruption Monitoring System (IMS) in 2005. Since then, subsequent upgrades and enhancements to the system have increased its capabilities. Due to communication limitations and equipment obsolescence, Otter Tail's IMS has reached its "end of life". On January 1, 2017, AT&T shut down its 2G network, disabling most of the voltage monitors in North Dakota. Sometime in late 2019, Verizon's CDMA 1XRTT, will be disabled, shutting down the IMS in both Minnesota, South Dakota, and what's left of North Dakota. Otter Tail has completed the install of the next generation of interruption monitoring solution (NextGen IMS) utilizing AMI technology in Minnesota, South Dakota, and North Dakota. This year (2019) will be the first complete year with system reliability data, and the first-year data for the SRSQ filing will be gathered from. This system is more granular then our current system, thus, Otter Tail expects future recorded results to be different then historic values. Otter Tail provides the following information relating to its IMS and overall reliability.

1. **IMS obsolescence status and efforts to implement the NextGen IMS:** Due to the planned shutdown of cellular 2G service and Sensus's decision to discontinue production of the monitors currently used in our system, Otter Tail has implemented a project to replace its obsolete IMS. Our implementation plan included the completion of the new system in North Dakota in 2017. Installation in Minnesota and South Dakota was completed in late 2018. Although components of future functionality are still in the process of debug and checkout, the new system will provide added tools and analysis features that will allow Otter Tail to continue its reliability focus and efforts in the future.

   Otter Tail continues to install and utilize wireless power quality monitors in identified problem areas. These devices monitor voltage, current, power, voltage unbalance, histograms, profiles, etc. in near real-time. These monitors have greatly improved our ability to monitor, identify, and analyze issues in the field. This tool was also utilized to fill short term gaps/pockets created during our NextGen IMS implementation during installation and system transfer.

2. **Challenges in achieving reliability:** Otter Tail has the unique challenge of delivering reliable services to its customers across a large rural service territory, which has tremendous exposure to hazards such as vegetation, lightning, wind, and other weather-related issues. Our new NextGen IMS and the use of power quality meters will continue to provide optimized and focused deployment of our vegetation management and maintenance resources to specific areas that are identified through the interruption data collection and analysis processes.

3. **Measuring reliability:** Otter Tail continues to calculate the Customers Experiencing Multiple Interruptions (CEMIn) index. The CEMIn index is an

excellent indicator of how system improvements directly affect customer service. Deployment of resources on worst performing circuits has direct effects on the reliability indices and customer reliability. **Figure 8** shows the system CEMIn (n = 7 interruptions) results from 2014 to 2018. This graph shows how many customers on a company-wide basis experienced seven or more interruptions. For example, in 2018 the percentage of customers experiencing seven or more interruptions was 0.7 percent, compared to 2017, which was 1.9 percent.

Figure 8

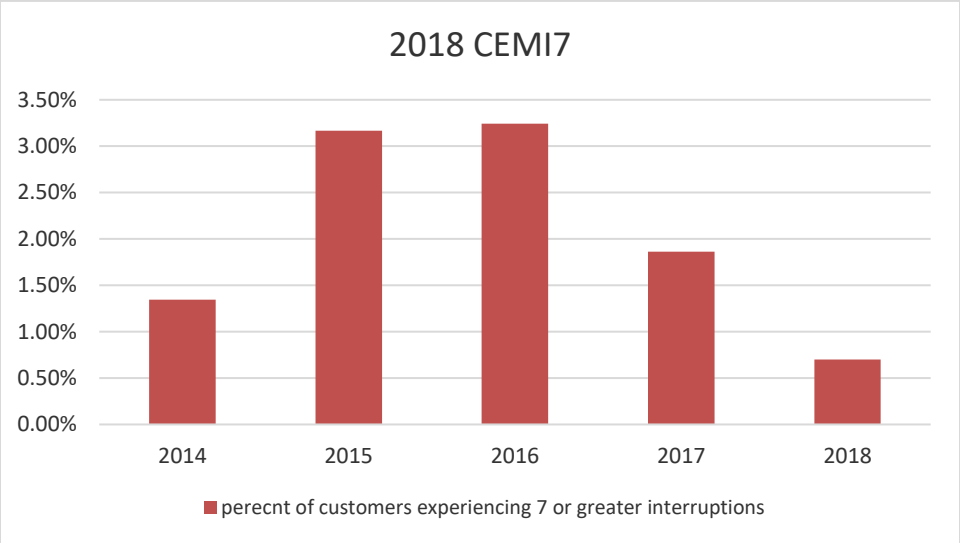
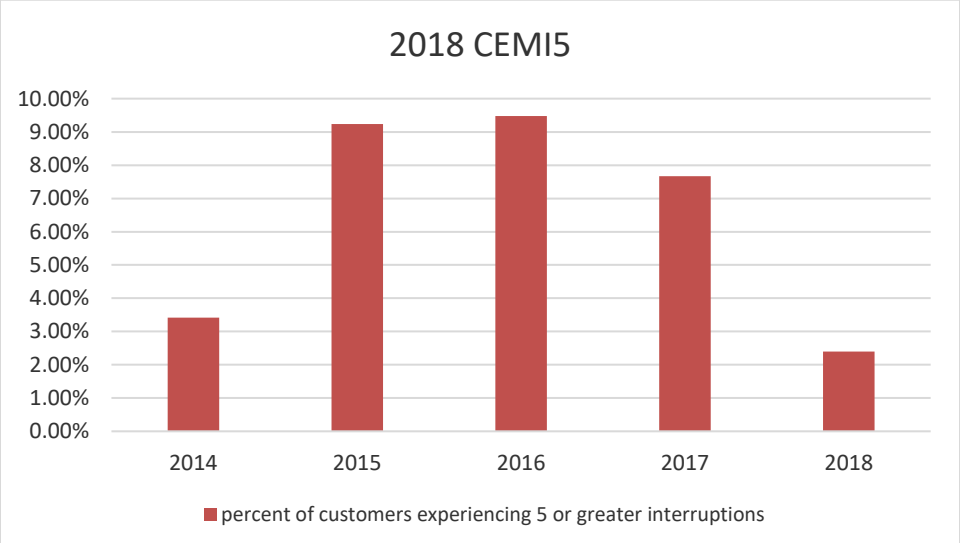


Figure 9 below shows the percentage of customers on a company-wide basis who have experienced five or more sustained interruptions.

Figure 9



Figures 10, 11, and 12. The following graphs show Otter Tail's SAIDI, SAIFI and CAIDI for the period of 2014 through 2018. When compared to 2017 results, Minnesota customers experienced an increase in overall SAIDI, SAIFI, and CAIDI.

Figure 10

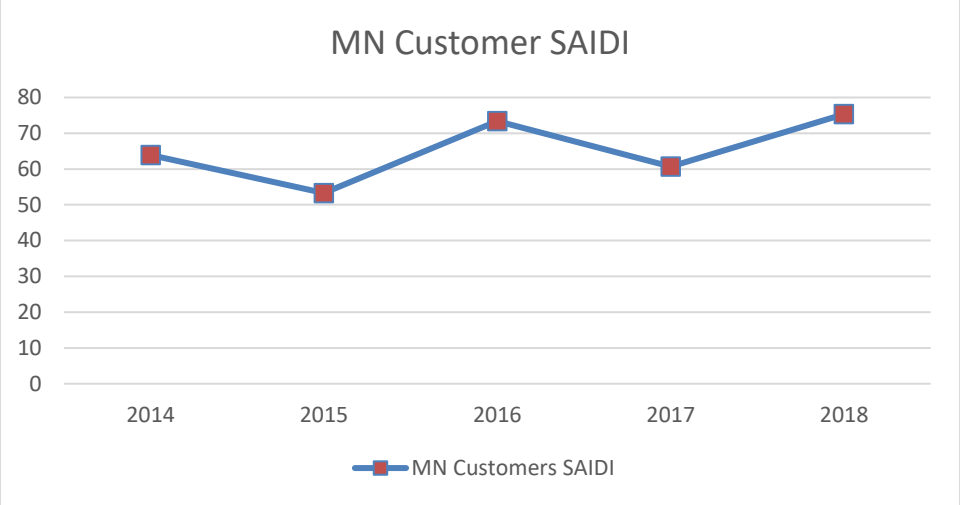


Figure 11

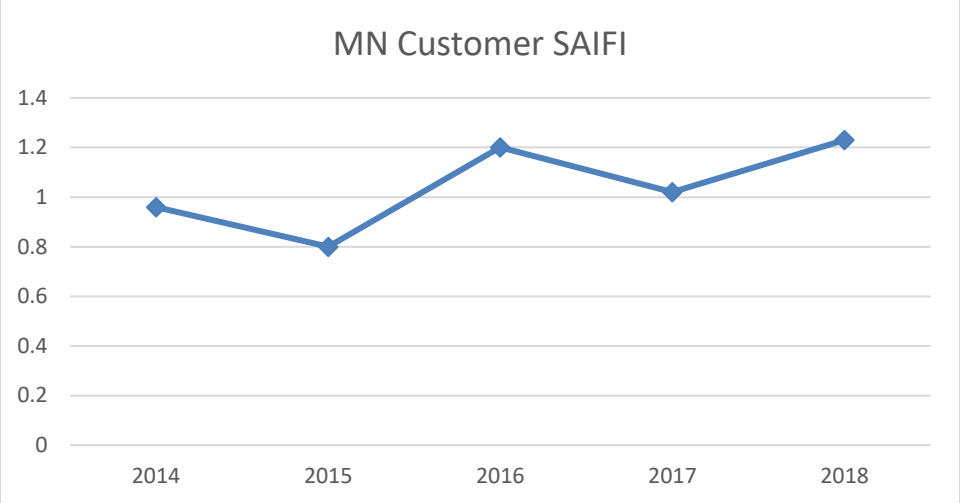
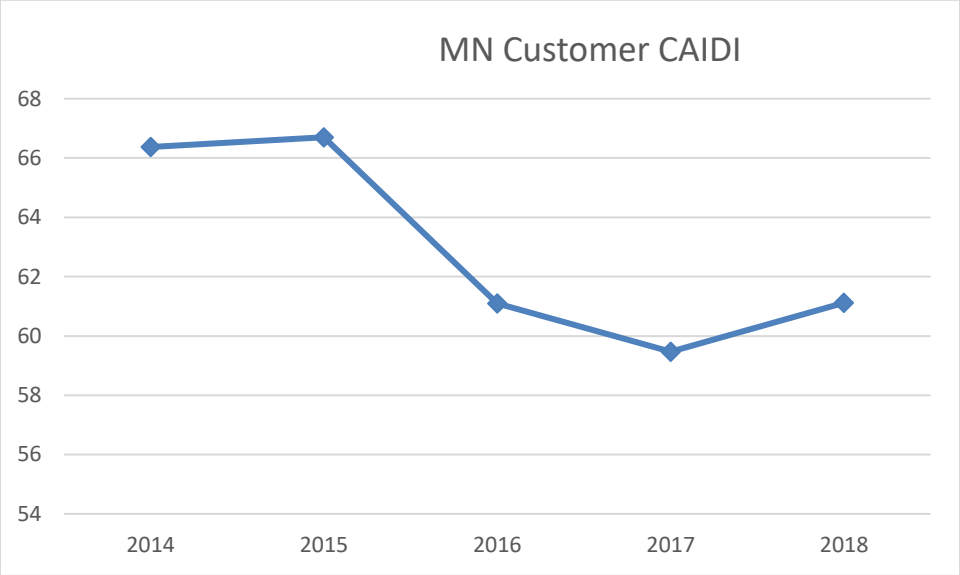


Figure 12



L. OTTER TAIL POLICIES, PROCEDURES, AND ADDITIONAL COMPLIANCE OBLIGATIONS

Otter Tail provides the following description of the policies and procedures that it has previously implemented and continue to utilize to improve reliability. Additional compliance obligation requirements are also provided.

The following is a list of reports that continue to be distributed internally. These reports ensure that Otter Tail employees are aware of issues in the system on a timely basis and can respond quickly to maintain and improve overall system reliability.

1. **Internal Reporting:**
    a. Monthly Reliability Report: Otter Tail distributes to all employees an overall summary of system performance as compared to internal KPI's. This report shows SAIDI, SAIFI, CAIDI, and MAIFI for the system. As the new IMS comes on line in 2019, monthly reports will include SAIDI, SAIFI, CAIDI, and MAIFI for each CSC as well.
    b. Additional reporting: Otter Tail will continue to track CEMI5 in 2019 and will develop internal KPI's that are reported and published to Otter Tail's Asset Management department.

2. **Proactive Inspections and Testing:**
    a. Field Inspections: Otter Tail conducts several periodic patrols and inspections throughout the transmission and distribution system. Transmission substations and lines are inspected and patrolled on an annual basis and more often when issues are identified. Distribution substations are inspected for safety and equipment concerns on a periodic basis. The oil in substation transformers are sampled and tested for dissolved gas.

Transformers greater than 10 MVA are tested annually and transformers less than 10 MVA are tested every three years.

b. Pole integrity testing: Otter Tail currently contracts for ground line inspections and treatment work of aged transmission poles for replacement identification.
c. Underground Replacement: Otter Tail continues its focus on replacing outdated and failing underground conductors. The Area Engineers proactively identify areas of concern and budget for replacement during the following year. Potential replacement candidates are identified and included in Otter Tail's Proactive UG Replacement project listing.

Additional Items: In addition to the above-mentioned items, Otter Tail also employs a number of other policies, procedures, and committees to evaluate reliability and safety concerns that include, but are not limited to:

- Distribution Standards Committee
- Line inspections
- Workforce Planning Committee
- Transformer Installation and Change-out Loading Guide
- Voltage upgrades and evaluations as needed
- Mobile underground fault locating vans and associated equipment
- Wildlife protection and deterrent devices

In compliance with the Commissions Orders in Docket E017/M-16-276 and E017/M-17-256 requiring the Company include in its next annual filing, Otter Tail provides the following.

1. **Benchmarking of Otter Tail's performance using the Institute of Electrical and Electronics Engineers (IEEE) reliability standards**. Otter Tail is a member of Edison Electric Institute (EEI) and has been participating in their Reliability Benchmark Survey for the past six years. Otter Tail provides the performance comparison utilizing the 2017 EEI Reliability Survey. The 2017 EEI Reliability Survey collected data from 89 utility companies. Summarizing, Otter Tail performs in the first quartile for CAIDI, Mid quartiles for SAIDI, and bottom quartiles for SAIFI and MAIFI. In **Figure 13** through **Figure 16** below is a visual summary of charts indicating where Otter Tail (#72) fits in terms of the benchmarked results. Otter Tail's results are represented by the red line on the bar graphs. Note that there are fewer respondents for the MAIFI survey due participating utilities lack of reporting regarding this index.

Figure 13

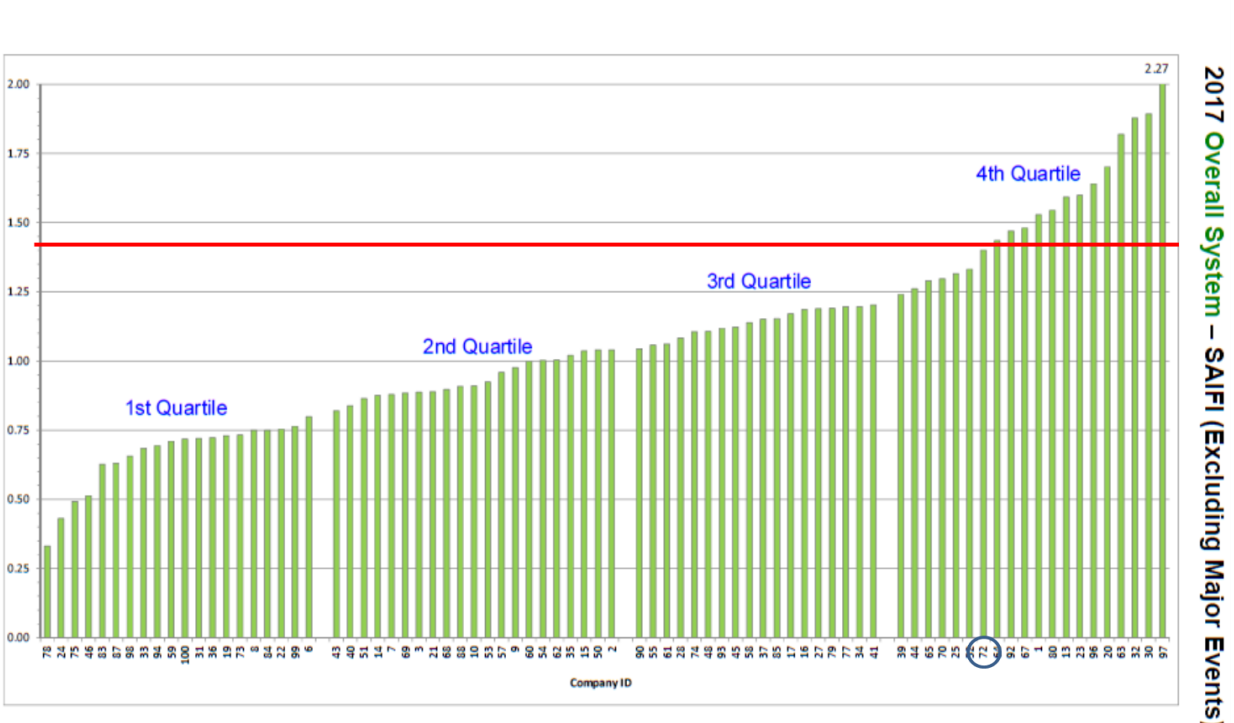


Figure 14

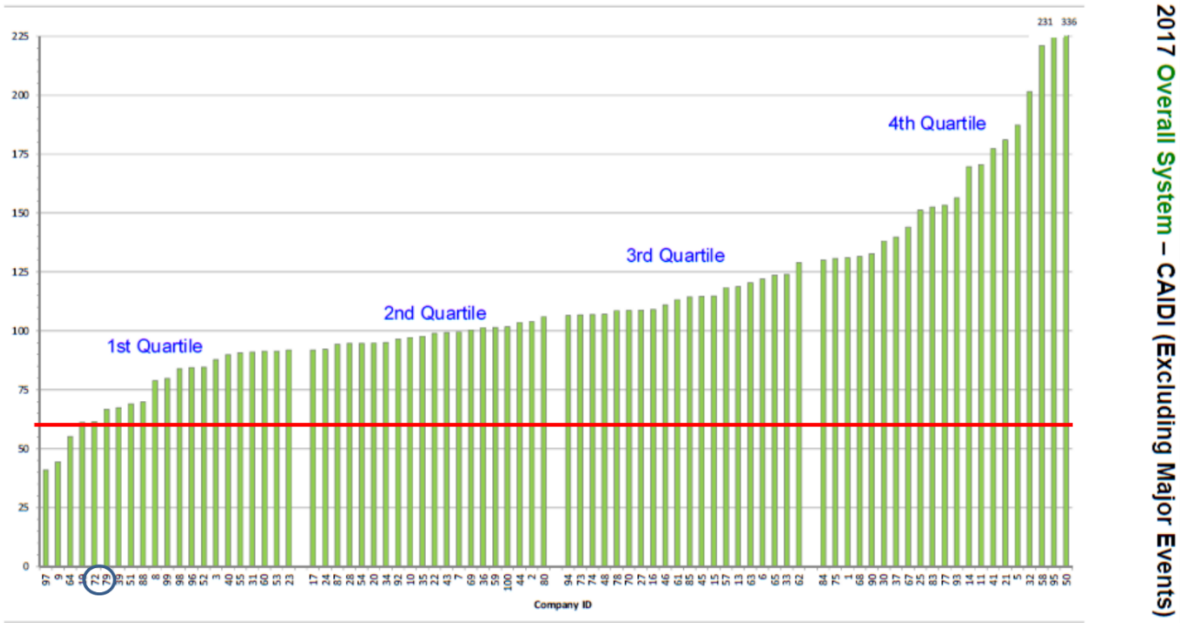


Figure 15

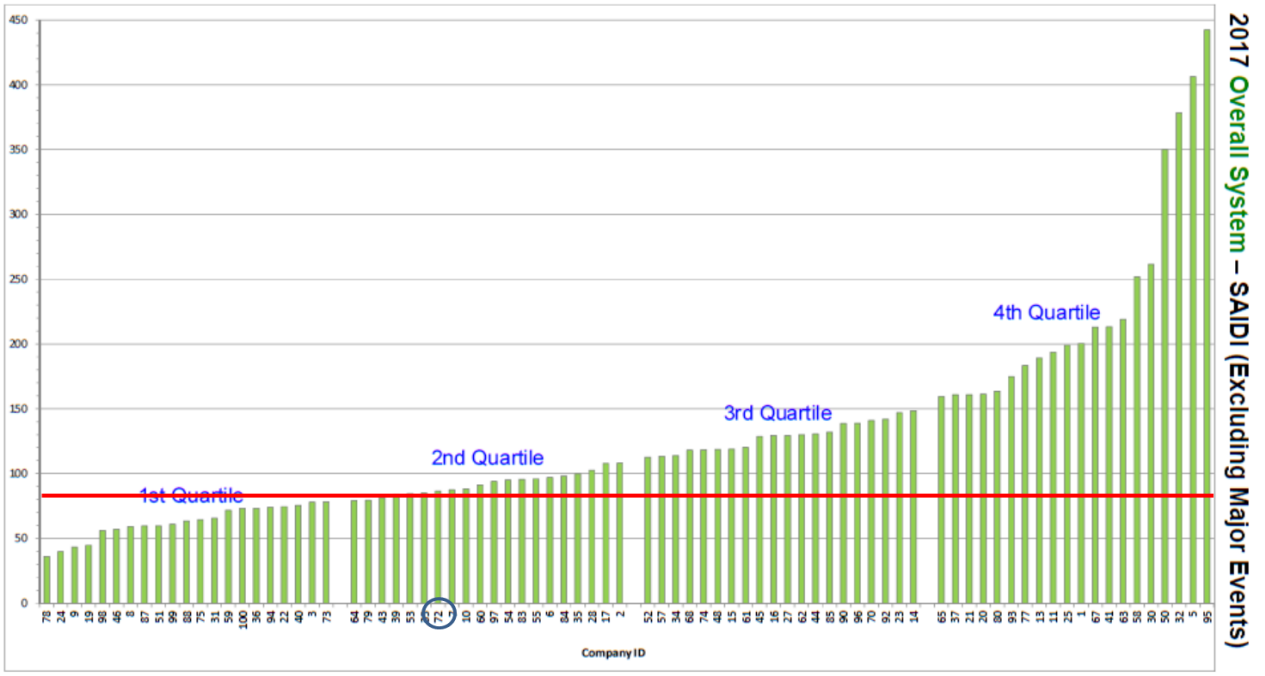
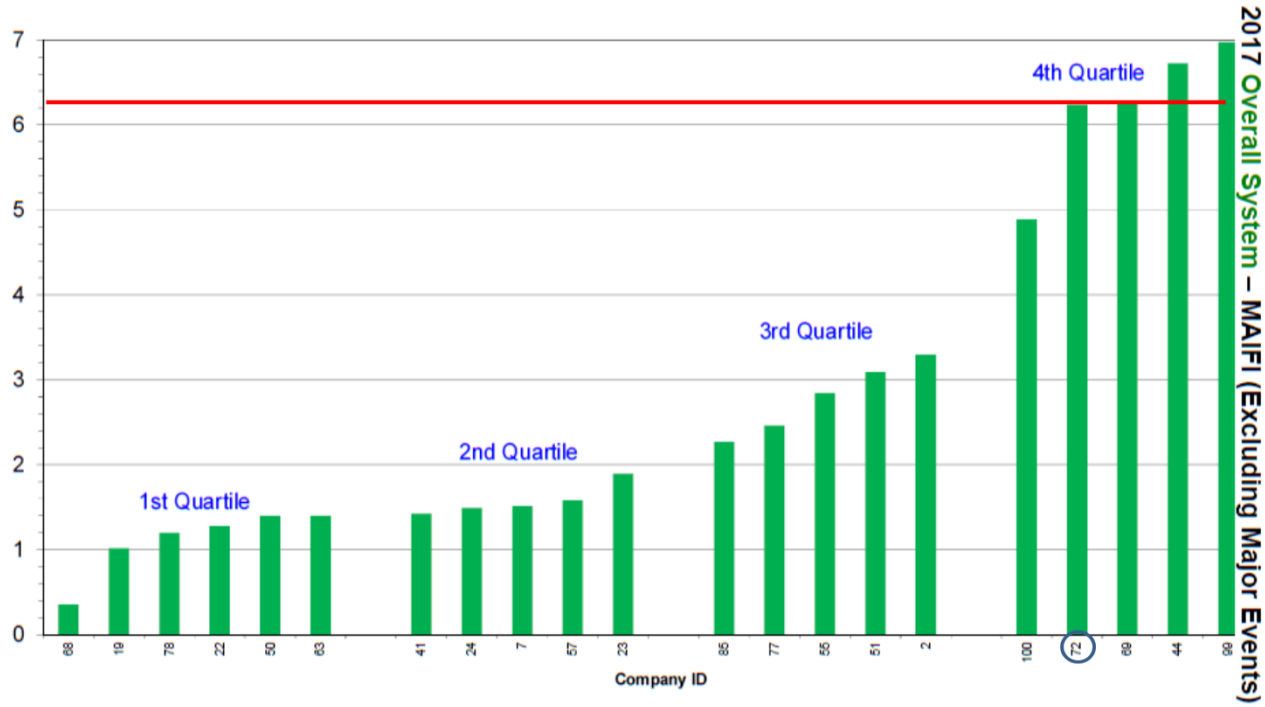


Figure 16



2. **A Discussion of impacts of reliability by customer class**. Otter Tail currently does not have the ability to monitor reliability by customer class. Otter Tail lost this capability three years ago on its old Interruption Monitoring System as vendor support to support monitoring customers by class disappeared. Our new Interruption Monitoring System which will be utilized in 2019 for reporting will have the future ability to create class groups and provide future customer class group analysis.

3. **A discussion of work the Company is doing to withstand and recover from longer term outage events**.

    - Otter Tail is part of the Midwest Transmission Assistance Group, MTAG. This is a consortium of eight regional utilities that coordinates and inventories long lead item utility equipment and provides a back pool of service personnel. If and when a major event occurs, members can solicit both manpower and equipment from members. MTAG meets twice a year to review and update its charter agreements.
    - Otter Tail's Innovation 2030 is one of the company's initiatives to review and plan future capital spend on T&D infrastructure, both hardware and software. Systems are being evaluated to improve reliability and provide customers with more information during interruptions. As part of this evaluation, existing standards will be reviewed. Withstanding or preventing outages will be a method to improve reliability as desired through the initiative.
    - As part of this initiative, described above, the company will be evaluating a formal Outage Management System, OMS, and a centralized Distribution desk to improve the efficiency of restoration efforts for all interruptions.

In addition to the Reliability Information reviewed previously in this report, Otter Tail provides the following information and discussion, pursuant to the Commission meeting regarding our 2017 report, in which the commission stated that it is requiring Minnesota Power, Otter Tail Power, and Xcel Energy to include the following in our 2019 filing (2018 report). *Note: There were slight differences between the briefing papers and the Commission's final written Order issued on March 19, 2019 so we've tried to address the Commission's intent. OTP's response to each area follow.*

1. Require some or all of the following reporting requirements on an ongoing basis
    a. Non-normalized SAIDI, SAIFI, and CAIDI values
    b. SAIDI, SAIFI, and CAIDI values calculated using the IEEE 2.5 beta method
    c. MAIFI, calculated using the IEEE 2.5 beta method, and non-normalized values
    d. CEMI – using 4 or more, 5 or more, and 6 or more outages**.**
    e. CELID – at 6 hours, 12 hours, and 24 hours
    f. Estimated Restoration
    g. IEEE Benchmarking
    h. Performance by Customer Class
    i. Leading causes of outages more discussion of the leading causes and mitigation strategies

1.a&b. Non-normalized SAIDI, SAIFI, and CAIDI values – these are previously shown in section IV Reliability Reporting Requirements 7826.0500, tables 4 and 4a.

1.c. MAIFI, calculated using the IEEE 2.5 beta method, and non-normalized values – MAIFI, non-normalized was previously shown and discussed in section II 2018 Summary Graphs. The following **Table 10** shows both MAIFI and MAIFI excluding MEDs via IEEE 2.5 beta method.

Table 10

CSC 2018	MAIFI	MAIFI 2.5 IEEE
Bemidji	4.95	4.72
Crookston	5.14	4.77
Fergus Falls	5.18	5.14
Milbank	8.95	8.95
Morris	6.71	6.69
Wahpeton	7.57	7.57
MN Total	5.59	5.45

1.d. CEMI using 4 or more, 5 or more, and 6 or more outages – CEMI5 and CEMI7 are previously shown and discussed in section IV Reliability Reporting Requirements 7826.0500, section K., OTHER INFORMATION RELEVANT IN EVALUATING RELIABILITY PERFORMANCE**,** specifically, figures 8 and 9. System CEMI for 2018 is shown in **Table 11** below:

Table 11

2018 System CEMI

CEMI4	7.69%
CEMI5	2.39%
CEMI6	1.73%
CEMI7	0.70%

Otter Tail's new interruption monitoring system is equipped with the capability to calculate CEMI5 by feeder, CSC, state, and the entire system. Requirements for additional CEMI durations (4 and 6 hours) will require software additions to the new system in the future.

1.e. CELID using 6 hours, 12 hours, and 24 hours – System CELID calculations for 2018 are shown in the **Table 12** below:

Table 12

2018 System CELID

CELID-6	5.26%
CELID-12	1.25%
CELID-24	0.00%

Otter Tail's new interruption monitoring system is equipped with the capability to calculate CELID-s60 by feeder, CSC, state, and the entire system. Requirements for additional CELID durations (6, 12, and 24 hours) will require software additions to the new system in the future.

1.f. Estimated Restoration – By definition, CAIDI results and/or goals, are actual or "estimated restoration" durations.

1.g. IEEE Benchmarking – As shown and discussed in section IV Reliability Reporting Requirements 7826.0500, K. OTHER INFORMATION RELEVANT IN EVALUATING RELIABILITY PERFORMANCE**.** Otter Tail is a member of Edison Electric Institute (EEI) and has been participating in their Reliability Benchmark Survey for the past six years. Otter Tail provides the performance comparison utilizing the 2017 EEI Reliability Survey. Otter Tail respectfully believes that, due to its participation in the survey and the fact that it includes a larger sample group surveyed, this is a superior benchmarking process for Otter Tail's performance comparisons.

1.h. Performance by Customer Class – Once Otter Tail's new interruption monitoring system analytic capabilities are fully implemented and commissioned, Otter Tail will have the capability to "break out" customers into various "classes" for performance analysis. Otter Tail requests future clarification as to class type and definition for this process.

1.i. Leading causes of outages more discussion of the leading causes and mitigation strategies – Otter Tail continues to improve on interruption cause analysis and utilization of this data for both capital spending forecasts and maintenance activities. It is our belief that the analytic capabilities of the new IMS will improve analysis granularity in the future and allow for increased mitigation strategies.

Additional indices Reporting Commission Order Summary: Otter Tail's new interruption monitoring system, currently has the capability to calculate the following indices by feeder, CSC, State, entire system, and defined regions:

SAIFI
SAIDI
CAIDI
CTAIDI
CAIFI
ASAI
CEMI-5
CELID-s60 (60 minutes)
MAIFI
MAIFe
CEMSMI-5
Total sustained customer minutes

Required reliability reporting additions (to this listing) will require investigations and subsequent software development conducted by the system and web hosting provider, Itron, and may have limitations based on technical feasibility of the system.

2. Require Minnesota Power, Otter Tail Power, and Xcel Energy in reports due April 1, 2019, to include a discussion of how grid modernization initiatives could impact reliability metrics and what technologies are needed to advance tracking additional metrics.

2. Discussion of how grid modernization initiatives could impact reliability metrics and what technologies are needed to advance tracking additional metrics.

Grid Modernization can take on many different definitions and perspectives. In March of 2019, the Commission staff issued a report on Grid Modernization for the state of Minnesota. Within that report, the following definition was given to guide discussions in Minnesota:
"A modernized grid assures continued safe, reliable, and resilient utility network operations, and enables Minnesota to meet its energy policy goals, including the integration of variable renewable electricity sources and distributed energy resources. An integrated, modern grid provides for greater system efficiency and greater utilization of grid assets, enables the development of new products and services, provides customers with necessary information and tools to enable their energy choices, and supports a standards-based and interoperable utility network"

Grid modernization discussions continued throughout 2017 and 2018 and in late 2018, through docket No. E017/CI-18-253, the commission adopted new requirements for Otter Tail and the other jurisdictional utilities in the state to file a biennial Integrated Distribution Planning report. Within those requirements, Otter Tail will discuss Grid Modernization efforts among other topics. Grid modernization efforts specific to Otter Tail will be described in detail through the integrated distribution plan so the information below is simply a high-level review, not necessarily specific to Otter Tail actions, but rather in response to the question posed for this report.

Within the industry, many grid modernization technologies are aimed at providing more reliable service and thus improve reliability metrics. One example is improved visibility and control of the system through outage management and distribution management systems. By better reacting to issues on the system through monitoring and control, outage effects can be lessened. The system can be monitored in many ways including SCADA, which is done by utilities today where available. Advanced metering infrastructure can also provide more information about the system to grid operations. It is probable, however, that both duration and frequency metrics will appear to increase as visibility is added to the system. For example, technologies may improve the actual total outage minutes observed by the customer on the system, but, measured metrics may appear worse than historical due to more system visibility. This will be an important distinction to recognize as visibility and increased monitoring is added to the system. In addition, a metric such as CAIDI may actually increase as quicker and less complex manual restorations become automated. Again, it is important to understand the total actual outage minutes observed by customers will still improve.

Otter Tail's new Interruption Monitoring System deploys AMI meter technology in a Bellwether configuration. It monitors reliability at the feeder level. That is, one single phase meter per phase, per feeder, or one three-phase meter per feeder. The system is designed to be expanded, i.e. additional installation of meters within the feeder for increased granularity or interruption visibility. Future full-scale deployment of AMI technology will aide in the tracking of additional

metrics and provide improvement in accuracy and reflection of our actual customer reliability experience.

The Otter Tail telecommunication strategy team is developing a draft plan to establish a two-tier communications model. Tier 1, as the primary focus, includes a high-available ring topology increasing communications availability, reliability and security throughout the service territory. Draft planning highly focuses on leveraging existing fiber investments to establish a Tier 1 core routing through sites including transmission and distribution substation, generation facilities and customer service centers. Tier 2 concentrates on providing communications to remote locations as linear segments off the Tier 1 core. The two-tier communications strategy provides a solid foundation for future telecommunication requirements for GRID Modernization initiatives including benefits to Transmission SCADA, System Protections, AMI, Load Management and distribution system visibility. As part of our plan development, Otter Tail is working with neighboring utilities to seek areas to leverage existing infrastructure and collaborate on regional fiber communications enhancement opportunities.

V. RELIABILITY STANDARDS 7826.0600

PROPOSED RELIABILITY PERFORMANCE STANDARDS

Minnesota Rule 7826.0600, Subpart 1, requires utilities to file proposed reliability performance standards in the form of proposed numerical values for the SAIDI, SAIFI, and CAIDI for each of its work centers.

As ordered in **Docket No. E017/M-15-322 dated August 14, 2015**, Otter Tail's reliability standards have been frozen, until the company has shown sufficient improvement in indices' performance. Otter Tail proposes to maintain the performance standards at 2013 levels until further improvement is achieved.

With the implementation of the new Interruption Monitoring System in 2019, Otter Tail does anticipate increases in SAIDI, SAIFI, and MAIFI results due to the new system's method of feeder data collection.

Table 13
Proposed Reliability Standards for 2019

Work Center	SAIDI	SAIFI	CAIDI
Bemidji	**70.64**	**1.26**	**56.06**
Crookston	**69.33**	**1.19**	**58.26**
Fergus Falls	**66.97**	**1.11**	**60.33**
Milbank	**75.49**	**1.82**	**41.48**
Morris	**55.78**	**1.01**	**55.23**
Wahpeton	**57.24**	**1.13**	**50.65**
All MN Customers	**64.95**	**1.13**	**57.48**

VI. REPORTING METER-READING PERFORMANCE 7826.1400

Minnesota Rule 7826.1400, **Reporting Meter Reading Performance, requires utilities to provide a detailed report on the utility's meter-reading performance.** In compliance with this rule, Otter Tail provides **Tables 14-18** for its meter reading performance for 2018.

A & B. The number and percentage of customer meters read by utility personnel and the number and percentage of customer meters self-read by the customer.

Table 14
Otter Tail Power Company Meter Reading Performance
January 1, 2018 to December 31, 2018
Residential – MN

Residential							
Month	Meters Read	%	Meters Estimated	%	Self Read	%	Total Meters
1	61,877	97.56%	750	1.18%	795	1.25%	63,422
2	61,740	97.34%	920	1.45%	767	1.21%	63,427
3	61,568	97.05%	1,099	1.73%	773	1.22%	63,440
4	61,342	96.63%	1,326	2.09%	812	1.28%	63,480
5	61,330	96.33%	1,519	2.39%	819	1.29%	63,668
6	61,583	95.30%	2,216	3.43%	818	1.27%	64,617
7	61,911	95.83%	1,875	2.90%	817	1.26%	64,603
8	63,730	98.52%	14	0.02%	941	1.45%	64,685
9	63,746	98.52%	19	0.03%	936	1.45%	64,701
10	63,386	98.49%	31	0.05%	938	1.46%	64,355
11	62,799	98.49%	35	0.05%	931	1.46%	63,765
12	62,828	98.50%	23	0.04%	935	1.47%	63,786
	747,840	97.38%	*9,827*	1.28%	*10,282*	1.34%	*767,949*

Table 15
Otter Tail Power Company Meter Reading Performance
January 1, 2018 to December 31, 2018
Small Commercial – MN

Small Commercial							
Month	Meters Read	%	Meters Estimated	%	Self Read	%	Total Meters
1	14,237	96.68%	183	1.24%	306	2.08%	14,726
2	14,236	96.63%	194	1.32%	302	2.05%	14,732
3	14,193	96.40%	229	1.56%	301	2.04%	14,723
4	14,214	96.38%	229	1.55%	305	2.07%	14,748
5	14,825	96.60%	221	1.44%	300	1.95%	15,346
6	14,758	95.56%	379	2.45%	306	1.98%	15,443
7	14,710	95.15%	436	2.82%	313	2.02%	15,459
8	15,121	97.74%	5	0.03%	344	2.22%	15,470
9	15,127	97.73%	7	0.05%	344	2.22%	15,478
10	15,066	97.67%	14	0.09%	345	2.24%	15,425
11	14,987	97.65%	17	0.11%	344	2.24%	15,348
12	14,463	97.64%	11	0.07%	338	2.28%	14,812
	175,937	96.82%	*1,925*	1.06%	*3,848*	2.12%	*181,710*

Table 16
Otter Tail Power Company Meter Reading Performance
January 1, 2018 to December 31, 2018
Large Commercial – MN

Large Commercial							
Month	Meters Read	%	Meters Estimated	%	Self Read	%	Total Meters
1	1,376	99.64%	5	0.36%	.		1,381
2	1,369	99.64%	5	0.36%	.		1,374
3	1,369	99.64%	5	0.36%	.		1,374
4	1,366	99.49%	7	0.51%	.		1,373
5	1,361	99.13%	12	0.87%	.		1,373
6	1,353	98.47%	21	1.53%	.		1,374
7	1,347	98.83%	16	1.17%	.		1,363
8	1,362	100.00%	.		.		1,362
9	1,364	100.00%	.		.		1,364
10	1,359	100.00%	.		.		1,359
11	1,359	100.00%	.		.		1,359
12	1,359	100.00%	.		.		1,359
	16,344	99.57%	*71*	0.43%	.		*16,415*

Table 17
Otter Tail Power Company Meter Reading Performance
January 1, 2018 to December 31, 2018
Total – MN

System							
Month	**Meters Read**	**%**	**Meters Estimated**	**%**	**Self Read**	**%**	**Total Meters**
1	77,490	97.44%	938	1.18%	1,101	1.38%	79,529
2	77,345	97.25%	1,119	1.41%	1,069	1.34%	79,533
3	77,130	96.97%	1,333	1.68%	1,074	1.35%	79,537
4	76,922	96.63%	1,562	1.96%	1,117	1.40%	79,601
5	77,516	96.43%	1,752	2.18%	1,119	1.39%	80,387
6	77,694	95.41%	2,616	3.21%	1,124	1.38%	81,434
7	77,968	95.75%	2,327	2.86%	1,130	1.39%	81,425
8	80,213	98.40%	19	0.02%	1,285	1.58%	81,517
9	80,237	98.40%	26	0.03%	1,280	1.57%	81,543
10	79,811	98.36%	45	0.06%	1,283	1.58%	81,139
11	79,145	98.35%	52	0.06%	1,275	1.58%	80,472
12	78,650	98.37%	34	0.04%	1,273	1.59%	79,957
	940,121	97.31%	*11,823*	1.22%	*14,130*	1.46%	*966,074*

C. The number and percentage of customer meters that have not been read by utility personnel for periods of 6 to 12 months and for periods of longer than 12 months, and an explanation as to why they have not been read.

In 2018, two meters for customers of Otter Tail were not read by utility personnel for a period of 6 months to 12 months. Otter Tail had 0 meters not read for a period greater than 12 months.

D. Data on monthly meter-reading staffing levels, by work center or geographical area.

Table 18

Row Labels	Jan 2018	Feb 2018	March 2018	April 2018	May 2018	June 2018	July 2018	Aug 2018	Sept 2018	Oct 2018	Nov 2018	Dec 2018
Bemidji	**9**	**9**	**9**	**9**	**9**	**9**	**9**	**9**	**9**	**9**	**9**	**9**
Service Representative	9	9	9	9	9	9	9	9	9	9	9	9
Crookston	**14**	**14**	**9**	**13**	**14**	**9**	**9**	**9**	**9**	**14**	**9**	**14**
Apprentice Service Repres	3	3	1	2	3	1	1	1	1	3	1	3
Service Representative	11	11	8	11	11	8	8	8	8	11	8	11
Fergus Falls	**13**	**13**	**15**	**13**	**13**	**14**	**14**	**14**	**14**	**13**	**13**	**13**
Service Representative	13	13	15	13	13	14	14	14	14	13	13	13
Milbank	**16**	**16**	**13**	**14**	**14**	**14**	**14**	**14**	**15**	**16**	**16**	**16**
Apprentice Service Repres	3	3	1	1	1	2	2	2	3	3	3	3
Service Representative	13	13	12	13	13	12	12	12	12	13	13	13
Morris	**13**	**13**	**14**	**12**	**12**	**14**	**14**	**14**	**14**	**13**	**14**	**13**
Apprentice Service Repres	1	1	1			1	1	1		1	1	1
Journeyman Meter Reader	1	1	1	1	1	1	1	1	1	1	1	1
Service Representative	11	11	12	11	11	12	12	12	13	11	12	11
Wahpeton	**10**	**10**	**9**	**10**	**10**	**9**	**9**	**9**	**9**	**10**	**8**	**10**
Service Representative	10	10	9	10	10	9	9	9	9	10	8	10
Grand Total	**75**	**75**	**69**	**71**	**72**	**69**	**69**	**69**	**70**	**75**	**69**	**75**

Note: Milbank - The Milbank CSC serves customers in both Minnesota and South Dakota and the number of employees represents all employees for the CSC.

Note: Wahpeton - The Wahpeton CSC Center serves customers in Minnesota, North Dakota and South Dakota and the number of employees represents all employees for the CSC.

Otter Tail utilizes its Service Representatives to read its meters on a monthly basis except in the following towns where a third party reads the Company's meters:

Amiret MN
Argyle MN
Audubon MN
Battle Lake MN
Bejou MN
Beltrami MN
Bemidji MN
Brooks MN
Browns Valley MN
Boyd MN
Burr MN
Campbell MN
Canby MN
Clearbrook MN
Climax, MN
Clitherall MN
Crookston MN
Dalton MN
Dent MN
Deer Creek MN
Detroit Lakes MN
Doran MN
Dumont MN
Eldred MN
Erskine MN
Fergus Falls MN
Fertile MN
Fisher MN
Frazee MN
Foxhome MN
Gentily MN
Green Valley MN
Gonvick MN
Gully MN
Hallock MN
Henning MN
Kent MN
Lockhart MN
Mahnomen MN
Marshall MN (Rural)
McIntosh MN
Milroy MN
Minneota MN
Nashua MN
New York Mills MN
Oklee MN
Oslo MN
Ottertail MN
Pelican Rapids MN
Perham MN
Plummer MN
Porter MN
Red Lake Falls MN
Richville MN
Rothsay MN
Saint Hilaire MN
Shevlin MN
Solway MN
St. Leo MN
Taunton MN
Tenney MN
Tintah MN
Trail MN
Twin Valley MN
Ulen MN
Underwood MN
Vergas MN
Vining MN
Waubun MN
Wendell MN
Wheaton MN
Wilton MN
Winger MN

VII. REPORTING INVOLUNTARY DISCONNECTIONS 7826.1500

Minnesota Rule 7826.1500, **Reporting Involuntary Disconnections, requires utilities to provide a detailed report on involuntary disconnections of service.** In compliance with this rule, Otter Tail provides its report of involuntary disconnections of service.

A. Number of customers who received disconnection notices.

Table 19

Month	Large Commercial	Residential	Small Commercial	Grand Total
January	19	4612	320	4951
February	20	5144	381	5545
March	23	5661	452	6136
April	19	5002	388	5409
May	26	5521	416	5963
June	16	4470	352	4838
July	20	4820	363	5203
August	29	7178	497	7704
September	20	4067	250	4337
October	29	6002	385	6416
November	17	3997	327	4341
December	34	5727	411	6172
Grand Total	272	62201	4542	67015

B. Number of customers who sought cold weather rule protection under Minnesota Statutes §216B.096 and §216B.097 and the number who were granted cold weather rule protection.

Table 20

Month	Customers who sought Cold Weather Rule Protection in 2018	Number Granted Cold Weather Protection in 2018
January	96	96
February	91	90
March	91	91
April	36	36
May	0	0
June	0	0
July	0	0
August	0	0
September	0	0
October	146	145
November	119	119
December	80	80

C. Total number of customers whose service was disconnected involuntarily and the number of these customers restored to service within 24 hours.

Table 21

7826.1500 Subpart C - Customers involuntarily disconnected in 2018				
Month	**Customer Class**	**Disconnected For more than 24 hours**	**Service Restored within 24 hours**	**Grand Total**
January	Residential	2	3	5
	Small Commercial	1	1	2
January Total		3	4	7
February	Residential	8	7	15
	Small Commercial	0	1	1
February Total		8	8	16
March	Residential	50	30	80
	Small Commercial	4	3	7
March Total		54	33	87
April	Residential	128	83	211
	Small Commercial	3	4	7
April Total		131	87	218
May	Residential	79	51	130
	Small Commercial	5	2	7
May Total		84	53	137
June	Residential	81	40	121
	Small Commercial	3	1	4
June Total		84	41	125
July	Residential	73	40	113
	Small Commercial	5	3	8
July Total		78	43	121
August	Residential	69	40	109
	Small Commercial	6	2	8
August Total		75	42	117
September	Residential	62	50	112
	Small Commercial	6	2	8
September Total		68	52	120
October	Residential	48	36	84
	Small Commercial	3	3	6
October Total		51	39	90
November	Residential	17	20	37
	Small Commercial	3	3	6
November Total		20	23	43
December	Residential	2	3	5
	Small Commercial	2	0	2
December Total		4	3	7
Grand Total		*660*	*428*	*1088*

D. Number of disconnected customers restored to service by entering into a payment plan.

Table 22

Month	Residential	Small Commercial	Large Commercial	Total
January	1	0	0	1
February	2	0	0	2
March	5	0	0	5
April	11	0	0	11
May	0	0	0	0
June	2	0	0	2
July	1	0	0	1
August	2	0	0	2
September	3	0	0	3
October	2	0	0	2
November	2	0	0	2
December	1	0	0	1
Totals	32	0	0	32

VIII. REPORTING SERVICE EXTENSION REQUEST RESPONSE TIMES 7826.1600

Minnesota Rule 7826.1600, Reporting Service Extension Request Response Times, requires utilities to provide a report on service extension request response times.

In compliance with this rule, Otter Tail provides in **Table 23** below its report of service extension request response times by customer class for each calendar month, in the following categories:

A. The number of customers requesting service to a location not previously served by Otter Tail 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, shown in Table 23.

B. The number of customers requesting service to a location previously served by the utility 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, shown in Table 23.

Table 23

7826.1600 - Otter Tail Power Company Service Extension Request Response Time report - 2018						
Month	Request Type	Days	Large Commercial	Residential	Small Commercial	Grand Total
January	Locations not previously served			9	9	18
	Locations previously served	0		54	8	62
January Total				63	17	80
February	Locations not previously served		1	3	11	15
	Locations previously served	0		61	6	67
		1		1		1
February Total			1	65	17	83
March	Locations not previously served			8	3	11
	Locations previously served	0		74	17	91
		1			1	1
March Total				82	21	103
April	Locations not previously served			1	4	5
	Locations previously served	0	1	126	20	147
April Total			1	127	24	152
May	Locations not previously served			15	5	20
	Locations previously served	0		204	37	241
May Total				219	42	261

Month	Request Type	Days	Large Commercial	Residential	Small Commercial	Grand Total
June	**Locations not previously served**		**1**	**27**	**18**	**46**
	Locations previously served	0		195	20	215
		1		2		2
		3		3		3
June Total			**1**	**227**	**38**	**266**
July	**Locations not previously served**			**75**	**17**	**92**
	Locations previously served	0	1	190	18	209
		1		3		3
		3		1		1
July Total			**1**	**269**	**35**	**305**
August	**Locations not previously served**			**29**	**28**	**57**
	Locations previously served	0		216	26	242
		1		2		2
August Total				**247**	**54**	**301**
September	**Locations not previously served**			**80**	**6**	**86**
	Locations previously served	0	2	173	25	200
		12		1		1
September Total			**2**	**254**	**31**	**287**
October	**Locations not previously served**			**57**	**15**	**72**
	Locations previously served	0		165	14	179
		1		2	1	3
October Total				**224**	**30**	**254**
November	**Locations not previously served**			**28**	**15**	**43**
	Locations previously served	0		115	10	125
November Total				**143**	**25**	**168**
December	**Locations not previously served**		**1**	**25**	**27**	**53**
	Locations previously served	0		76	7	83
December Total			**1**	**101**	**34**	**136**
Grand Total			**7**	**2,021**	**368**	**2,396**

IX. REPORTING CALL CENTER RESPONSE TIMES 7826.1700

Minnesota Rule 7826.1700, Reporting Call Center Response Times, requires utilities to provide 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 information.

In compliance with this rule, Otter Tail provides its report of call center response times for 2018 in **Table 24**. **Figure 17** shows a historical graph showing the percent of Minnesota calls answered within 20 seconds.

Table 24

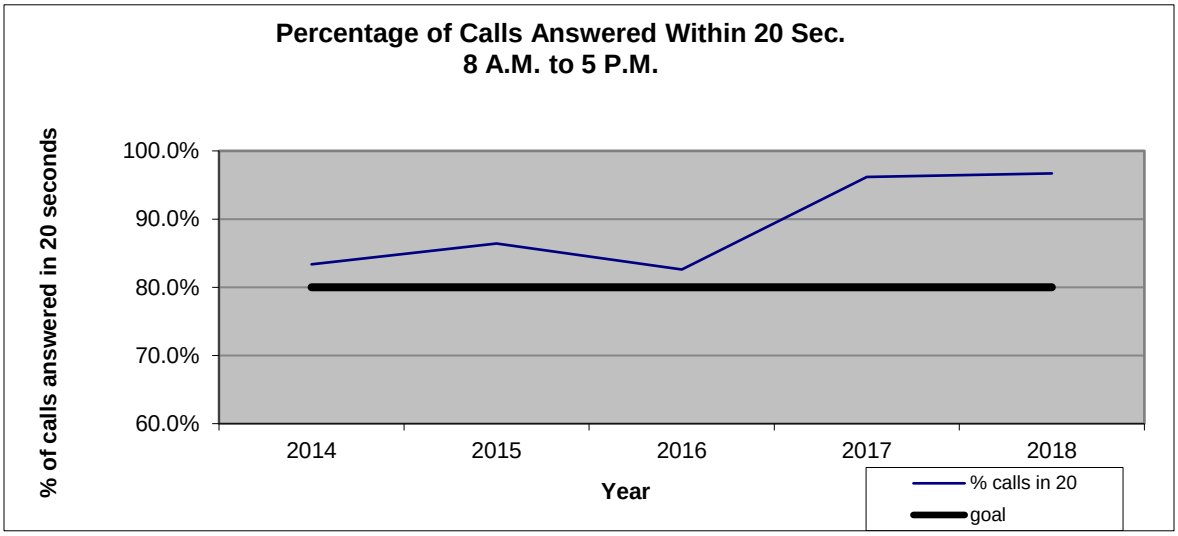
	(A)	(B)	(C)	(D)	(E)
Month	**Offered**	**Calls Abandoned**	**Calls Answered after 20 Seconds**	**Answered within 20 Seconds**	**Percent Answered within 20 seconds[1]**
January-2018	4214	29	45	4169	98.9
February-2018	3742	32	63	3679	98.3
March-2018	4794	33	104	4690	97.8
April-2018	4702	25	85	4617	98.2
May-2018	5497	43	102	5395	98.1
June-2018	5404	41	101	5303	98.1
July-2018	5717	31	175	5542	96.9
August-2018	6279	50	351	5928	94.4
September-2018	5855	45	367	5488	93.7
October-2018	6095	43	197	5898	96.8
November-2018	4897	41	238	4659	95.1
December-2018	3517	27	170	3347	95.2
Total	60713	440	1998	58715	96.7

[1]Column (D) / Column (A) = Percent answered within 20 Seconds

Otter Tail operates a call center using agents located in nine office locations across our entire service territory. Agents in these office locations answer calls from our Minnesota, North Dakota and South Dakota customers.

In March of 2017, Otter Tail went live with a new telecommunications system. With the new telecommunications system, we implemented an auto attendant that allows customers to select the state in which the account or service the customer is calling to inquire about. The auto attendant for selecting the state is for reporting purposes only. All calls to our customer service number are answered in order in which they are received.

Figure 17


Percentage of Calls Answered Within 20 Sec.
8 A.M. to 5 P.M.
% of calls answered in 20 seconds
100.0%
90.0%
80.0%
70.0%
60.0%
2014
2015
2016
2017
2018
Year
% calls in 20
goal

X. REPORTING EMERGENCY MEDICAL ACCOUNT STATUS 7826.1800

Minnesota Rule 7826.1800, Reporting Emergency Medical Account Status, requires utilities to provide a report that includes the number of customers who requested emergency medical account status under Minnesota Statutes, section 216B.098 subdivision 5, the number whose applications were granted, and the number whose applications were denied and the reason for each denial.

In compliance with this rule, Otter Tail reports that during 2018 Otter Tail had 8 Minnesota customers request emergency medical account status. Otter Tail granted this status to all 8 customers.

XI. REPORTING CUSTOMER DEPOSITS 7826.1900

Minnesota Rule 7826.1900, Reporting Customer Deposits, requires utilities to provide a report on the number of customers who were required to make a deposit as a condition of receiving service.

In compliance with this rule, Otter Tail reports that 685 customers were required to make a deposit as a condition of receiving service during 2018. The number of deposit requests decreased by 13 when compared to 2017.

XII. REPORTING CUSTOMER COMPLAINTS 7826.2000

Minnesota Rule 7826.2000, Reporting Customer Complaints, requires utilities to provide a detailed report on complaints by customer class and calendar month.

In compliance with this rule, Otter Tail provides the following information on complaints the Company received during 2018.

A & 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 the customer complaints.

Table 25

Complaint Type	Total	Percent of Total
Alleged Billing Errors	0	0.00%
Load Control	0	0.00%
High Bills	2	5.88%
Inaccurate Meter reading	0	0.00%
Tree Trimming	0	0.00%
Other	16	47.06%
Property Damage	16	47.06%
	34	100.00%

*Other – this category contains any complaints not included within the various complaint sections in our Customer Information System. The types of complaints included in the "Other" category include such things as rebate timing, planned outages and third party meter readers.

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

Table 26

2018		
Resolved by	**Total**	**Percentage**
(1) Resolved on Initial Inquiry	16	47%
(2) Resolved within 10 days	17	50%
(3) Resolved in greater than 10 days	1	3%
Grand Total	34	100.00%

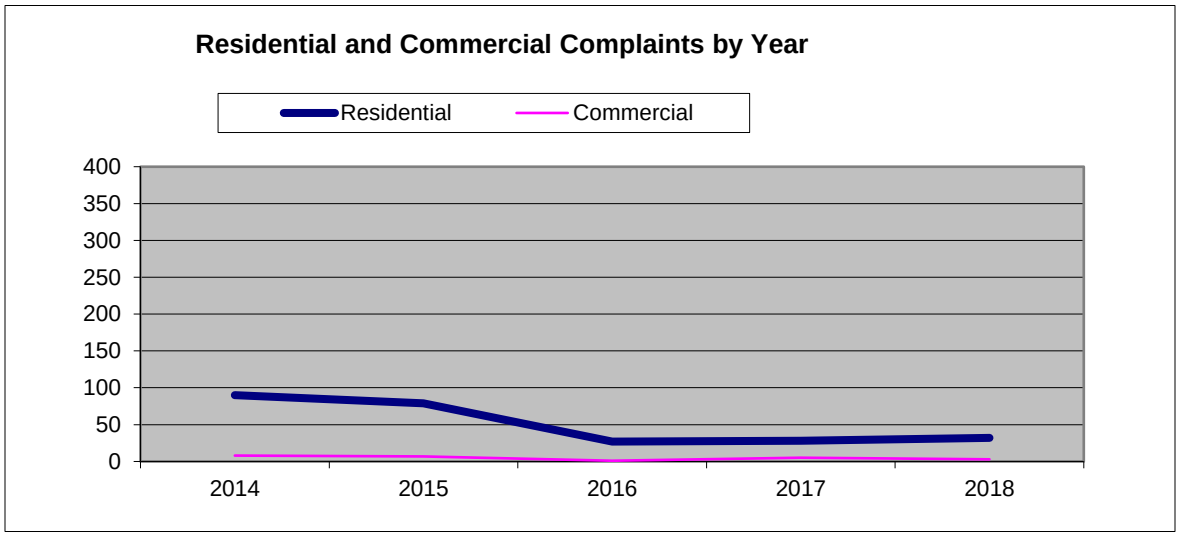
D. The number and percentage of all complaints resolved by taking any of the following actions: (1) taking the action the customer requested; (2) taking an action the customer and the utility agree is an acceptable compromise, (3) providing the customer with information that demonstrates that the situation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

Table 27

Action Taken	**Total**	**Percentage**
(1) Took action the Customer requested	7	20.59%
(2) Provided the customer with information that demonstrates that the situation complained of is not reasonably within the control of Otter Tail	8	23.53%
(3) Took an action the customer and the utility agree is an acceptable compromise	16	47.06%
(4) Refused to take action the customer requested	3	8.82%
Grand Total	34	100.00%

Figure 18 below is a graph showing complaints by customer class for the previous five years.

Figure 18



E. The number of complaints forwarded to the utility by the Commission's Consumer Affairs Office for further investigation and action.

Otter Tail received five customer complaints in 2018 that were forwarded from the Commission's Consumer Affairs Office, all of which have been resolved. The number of complaints received in 2018 increased by three in comparison to 2017.

From: Olson, Wendi
To: "consumer.puc@state.mn.us"
Cc: Regulatory
Subject: Otter Tail Power Company Major Service Interruption Report - Carlos, MN (April 16, 2018)
Date: Tuesday, April 17, 2018 9:37:53 AM

Otter Tail Power Company Major Service Interruption Report – Carlos, MN and Surrounding Areas

Location: Carlos Substation
Date: April 16, 2018 (Monday night)
Cause: The Carlos Substation had a high side arrester short out.
Customers affected: 545
Time out: 10:04 PM
Restored: 11:35 PM
Duration: 1 hour and 31 minutes

Thank you!

Wendi A. Olson
Otter Tail Power Company | Regulatory Compliance Specialist
215 South Cascade Street | Fergus Falls, MN 56538-0496
Phone: 218-739-8699 | wolson@otpco.com

From: Olson, Wendi
To: "consumer.puc@state.mn.us"
Cc: Regulatory
Subject: Otter Tail Power Company Major Service Interruption Report - Fergus Falls, MN (June 6, 2018)
Date: Wednesday, June 6, 2018 9:08:19 AM

Otter Tail Power Company Major Service Interruption Report – Fergus Falls

Location: Fergus Falls
Substation: Fergus Northeast
Date: June 6, 2018
Cause: Weather related – a storm rolled through last night.
Customers affected: 600
Time out: 1:53 AM
Restored: 3:34 PM
Duration: 1 hour and 41 minutes

Thank you!

Wendi A. Olson
Otter Tail Power Company | Regulatory Compliance Specialist
215 South Cascade Street | Fergus Falls, MN 56538-0496
Phone: 218-739-8699 | wolson@otpco.com

From: Olson, Wendi
To: "consumer.puc@state.mn.us"
Cc: Regulatory
Subject: Otter Tail Power Company Major Service Interruption Report - Mahnomen MN Area
Date: Friday, June 29, 2018 8:10:30 AM

Otter Tail Power Company Major Service Interruption Report – Mahnomen area

Locations: Winger, Mahnomen, Waubun, Bejou, Mentor, Clearbrook
Date: June 29, 2018
Cause: Storm related issues with the 230 KV sub in Winger. We are assessing the problems.
Customers affected: Approximately 3000
Outage time: 5:00 AM
Restoration: Unknown
Duration: Unknown

Thank you!

Wendi A. Olson
Otter Tail Power Company | Regulatory Compliance Specialist
215 South Cascade Street | Fergus Falls, MN 56538-0496
Phone: 218-739-8699 | wolson@otpco.com

From: Olson, Wendi
To: consumer.puc@state.mn.us
Subject: Otter Tail Power Company Major Service Interruption
Date: Wednesday, July 4, 2018 2:32:48 PM

Otter Tail Power Company had Minnesota Customers that experienced outages earlier today.

Locations: Bemidji, Ottertail, New York Mills, Deer Creek, Henning

Outage Time: 7 AM

Approximate Number of Customers Affected: 2350

Cause of the Interruption: Storms in these areas.

Approximate Restoration Times(s):
8:50 AM (1750 customers)
9:15 AM (600 customers)

Thank you,
Wendi Olson
Regulatory Compliance Specialist
Otter Tail Power Company
218 205-5936

From: Olson, Wendi
To: "consumer.puc@state.mn.us"
Cc: Regulatory
Subject: Otter Tail Power Company Major Service Interruption Report - Bemidji MN
Date: Monday, July 9, 2018 8:01:29 AM

Otter Tail Power Company Major Service Interruption Report – Bemidji MN

Location: Bemidji
Date: July 8, 2018
Cause: Line down on the east feeder out of the Bemidji 25th St. Substation. Line was repaired and power was restored.
Customers affected: Approximately 984
Outage time: 11:11 PM – July 8th
Restoration: 1:56 AM – July 9th
Duration: 2 Hours and 45 minutes

Thank you!

Wendi A. Olson
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215 South Cascade Street | Fergus Falls, MN 56538-0496
Phone: 218-739-8699 | wolson@otpco.com

From: Olson, Wendi
To: "consumer.puc@state.mn.us"
Cc: Regulatory
Subject: Otter Tail Power Company Major Service Interruption Report - Morris MN
Date: Monday, August 20, 2018 9:14:50 AM

Otter Tail Power Company Major Service Interruption Report – Morris MN

Location: Morris, MN
Date: August 19, 2018
Cause: The entire feeder was out due to bad primary underground
Customers affected: Approximately 798
Outage time: 9:03 PM
Restoration: 10:30 PM
Duration: 1 hour and 27 minutes

Thank you!

Wendi A. Olson
Otter Tail Power Company | Regulatory Compliance Specialist
215 South Cascade Street | Fergus Falls, MN 56538-0496
Phone: 218-739-8699 | wolson@otpco.com

From: Olson, Wendi
To: "consumer.puc@state.mn.us"
Cc: Regulatory
Subject: Otter Tail Power Company Major Interruptions - Several Communities near Winger, MN
Date: Monday, August 27, 2018 11:16:52 AM

Otter Tail Power Company customers experienced outages overnight.

Date: August 26, 2018 and August 27, 2018
Cause of the Interruptions: Storm rolling through the area.

Location: Clearbrook, MN
Outage Time: 12:05 AM
Approx. Restoration Time: 5:30 AM
Duration: 5 hour and 25 minutes
Approximate Number of Customers Affected: 360

Location: Gonvick, MN
Outage Time: 12:05 AM
Approx. Restoration Time: 2:00 AM
Duration: 1 hour and 55 minutes
Approximate Number of Customers Affected: 215

Location: Bejou, Wauben and Winger, MN
Outage Time: 11:41 PM
Approx. Restoration Time: 4:09 AM
Duration: 4 hour and 28 minutes
Approximate Number of Customers Affected:

Bejou - 79
Waubun - 263
Winger – 156

Isolated service related issues remain for some customers. Let me know if you have any questions.

Thank you!

Wendi A. Olson
Otter Tail Power Company | Regulatory Compliance Specialist
215 South Cascade Street | Fergus Falls, MN 56538-0496
Phone: 218-739-8699 | wolson@otpco.com

From: Jacobs, Brett M
To: consumer.puc@state.mn.us; Regulatory
Subject: Otter Tail Power Company Major Interruptions - Several Communities near Canby, MN
Date: Wednesday, September 26, 2018 4:37:50 PM

Good Afternoon,

Otter Tail Power Company customers experienced outages this morning.

Date: September 26, 2018
Cause of the Interruption: Power line down near the Verdi Substation

Location: Canby, MN
Outage Time: 08:00 am
Approx. Restoration Time: 09:43 am
Duration: 1 hour and 43 minutes
Approximate Number of Customers Affected: 1167

Location: Lake Benton, MN
Outage Time: 08:00 am
Approx. Restoration Time: 09:43 am
Duration: 1 hour and 43 minutes
Approximate Number of Customers Affected: 476

Location: Hendricks, MN
Outage Time: 08:00 am
Approx. Restoration Time: 09:43 am
Duration: 1 hour and 43 minutes
Approximate Number of Customers Affected: 599

Location: Verdi, MN
Outage Time: 08:00 am
Approx. Restoration Time: Undetermined
Duration: N/A
Approximate Number of Customers Affected: 43

Location: Ivanhoe, MN
Outage Time: 08:00 am
Approx. Restoration Time: 09:43 am
Duration: 1 hour and 43 minutes
Approximate Number of Customers Affected: 464

Service related issues remain for customers in Verdi as efforts to restore power are ongoing. Please let me know if you have any questions,

Brett Jacobs

Otter Tail Power Company | Regulatory Compliance Specialist
215 South Cascade Street | Fergus Falls, MN 56537
Phone: 218-739-8712 | bjacobs@otpco.com

From: Olson, Wendi
To: "consumer.puc@state.mn.us"
Cc: Regulatory
Subject: Otter Tail Power Company Major Interruption - Bemidji, MN
Date: Thursday, October 4, 2018 8:08:41 AM

Good Morning,

Some of Otter Tail Power Company's Bemidji customers experienced an outage last night.

Date: October 3, 2018
Location: Bemidji, MN (East side of Lake Bemidji)
Feeder: Bemidji Nymore-Lavinia Feeder
Outage Time: 7:45 pm
Approximate Restoration Time: 9:15 pm
Approx. Duration: 1 hour and 30 minutes
Approximate Number of Customers Affected: 825
Cause of the Interruption: Tree damage due to strong winds.

Please let me know if you have any questions.

Wendi A. Olson
Otter Tail Power Company | Regulatory Compliance Specialist
215 South Cascade Street | Fergus Falls, MN 56538-0496
Phone: 218-739-8699 | wolson@otpco.com

From: Olson, Wendi
To: "consumer.puc@state.mn.us"
Cc: Regulatory
Subject: Otter Tail Power Company Major Interruption - Mahnomen MN PLANNED OUTAGE
Date: Wednesday, October 3, 2018 7:45:12 AM

Good Morning,

Otter Tail Power Company has a planned outage scheduled in Mahnomen MN early tomorrow morning.

Date: October 4, 2018
Location: Mahnomen, MN
Outage Time: 2:00 am
Approx. Duration: 3 to 4 hours
Approximate Number of Customers Affected: 892
Cause of the Interruption: Substation maintenance to replace the regulatory bypasses and to repair buss work on the steel beams. This maintenance cannot be done while we are in service.

Customer Notifications: Flyers have been placed around town, we've posted a Twitter update, our outage webpage has been updated, we've made personal visits to our large critical customers and this planned outage has been broadcast on the local radio station.

Please let me know if you have any questions.

Wendi A. Olson
Otter Tail Power Company | Regulatory Compliance Specialist
215 South Cascade Street | Fergus Falls, MN 56538-0496
Phone: 218-739-8699 | wolson@otpco.com

From: Olson, Wendi
To: "consumer.puc@state.mn.us"
Cc: Regulatory
Subject: Otter Tail Power Company Major Interruption - Fertile, Twin Valley, Lockhart, Beltrami
Date: Friday, October 5, 2018 9:02:31 AM

Good Morning,

Otter Tail Power Company customers experienced outages overnight.

Date: October 5, 2018
Location: Communities of Fertile, Twin Valley, Lockhart and Beltrami.
Outage Time: 12:19 am
Approximate Restoration Time: 4:15 am
Approx. Duration: 3 hour and 56 minutes
Approximate Number of Customers Affected: 1100
Cause of the Interruption: Weather related transmission issues.

Please let me know if you have any questions.

Wendi A. Olson
Otter Tail Power Company | Regulatory Compliance Specialist
215 South Cascade Street | Fergus Falls, MN 56538-0496
Phone: 218-739-8699 | wolson@otpco.com

From: Olson, Wendi
To: Staff, CAO (PUC)
Cc: Regulatory
Subject: Otter Tail Power Company Major Interruption - Ashby, Elbow Lake, Erdahl, and Evansville
Date: Monday, December 3, 2018 8:10:22 AM

Good Morning,

Otter Tail Power Company customers experienced an outage in the following communities last night.

Date: December 2, 2018
Location: Ashby, Elbow Lake, Erdahl, and Evansville, MN
Outage Time: 9:10 PM
Estimated Restoration Time: 11:15 PM
Approx. Duration: 2 hours and 5 minutes
Approximate Number of Customers Affected: 800
Cause of the Interruption: Pole Fire

*The majority of the customers were on by 11:15 PM. The remaining few were back on by 2:00 AM when the pole was repaired.

Please let me know if you have any questions.

Wendi A. Olson
Otter Tail Power Company | Regulatory Compliance Specialist
215 South Cascade Street | Fergus Falls, MN 56538-0496
Phone: 218-739-8699 | wolson@otpco.com

From: Olson, Wendi
To: Staff, CAO (PUC)
Cc: Regulatory
Subject: Otter Tail Power Company Major Interruption - Erdahl, Ashby, Melby, Elbow Lake, Evansville
Date: Monday, December 10, 2018 9:49:18 AM

Good Morning,

Otter Tail Power Company customers experienced outages Sunday.

Date: December 9, 2018
Location: Communities of Erdahl, Ashby, Melby, Elbow Lake, and Evansville
Outage Time: 12:34 PM
Restoration Time: 3:20 PM
Approx. Duration: 2 hours and 46 minutes
Approximate Number of Customers Affected: 514
Cause of the Interruption: A small animal in the substation caused damage and repairs were needed to restore power.

Please let me know if you have any questions.

Wendi A. Olson
Otter Tail Power Company | Regulatory Compliance Specialist
215 South Cascade Street | Fergus Falls, MN 56538-0496
Phone: 218-739-8699 | wolson@otpco.com

CERTIFICATE OF SERVICE

RE: In the Matter of Otter Tail Power Company 2018 Annual Safety, Reliability and Service Quality Report and Proposed SAIFI, SAIDI and CAIDI Reliability Standards for 2019
Docket No. E017/M-19-

I, Jana Hrdlicka, hereby certify that I have this day served a copy of the following, or a summary thereof, on Daniel P. Wolf and Sharon Ferguson by e-filing, and to all other persons on the attached service list by electronic service or by First Class Mail.

Otter Tail Power Company
Annual Report

Dated this 1st day of April, 2019

/s/ JANA HRDLICKA
Jana Hrdlicka, Regulatory Filing Coordinator
Otter Tail Power Company
215 South Cascade Street
Fergus Falls MN 56537
(218) 739-8879

First Name	Last Name	Email	Company Name	Address	Delivery Method	View Trade Secret	Service List Name
Christopher	Anderson	canderson@allete.com	Minnesota Power	30 W Superior St Duluth, MN 558022191	Electronic Service	No	GEN_SL_Otter Tail Power Company_2018 SRSQ Report
Ray	Choquette	rchoquette@agp.com	Ag Processing Inc.	12700 West Dodge Road PO Box 2047 Omaha, NE 68103-2047	Electronic Service	No	GEN_SL_Otter Tail Power Company_2018 SRSQ Report
Generic Notice	Commerce Attorneys	commerce.attorneys@ag.state.mn.us	Office of the Attorney General-DOC	445 Minnesota Street Suite 1800 St. Paul, MN 55101	Electronic Service	No	GEN_SL_Otter Tail Power Company_2018 SRSQ Report
Ian	Dobson	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_Otter Tail Power Company_2018 SRSQ Report
James C.	Erickson	jericksonkbc@gmail.com	Kelly Bay Consulting	17 Quechee St Superior, WI 54880-4421	Electronic Service	No	GEN_SL_Otter Tail Power Company_2018 SRSQ Report
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_Otter Tail Power Company_2018 SRSQ Report
Shane	Henriksen	shane.henriksen@enbridge.com	Enbridge Energy Company, Inc.	1409 Hammond Ave FL 2 Superior, WI 54880	Electronic Service	No	GEN_SL_Otter Tail Power Company_2018 SRSQ Report
James D.	Larson	james.larson@avantenergy.com	Avant Energy Services	220 S 6th St Ste 1300 Minneapolis, MN 55402	Electronic Service	No	GEN_SL_Otter Tail Power Company_2018 SRSQ Report
Douglas	Larson	dlarson@dakotaelectric.com	Dakota Electric Association	4300 220th St W Farmington, MN 55024	Electronic Service	No	GEN_SL_Otter Tail Power Company_2018 SRSQ Report
Kavita	Maini	kmaini@wi.rr.com	KM Energy Consulting LLC	961 N Lost Woods Rd Oconomowoc, WI 53066	Electronic Service	No	GEN_SL_Otter Tail Power Company_2018 SRSQ Report

First Name	Last Name	Email	Company Name	Address	Delivery Method	View Trade Secret	Service List Name
Andrew	Moratzka	andrew.moratzka@stoel.com	Stoel Rives LLP	33 South Sixth St Ste 4200 Minneapolis, MN 55402	Electronic Service	No	GEN_SL_Otter Tail Power Company_2018 SRSQ Report
Larry L.	Schedin	Larry@LLSResources.com	LLS Resources, LLC	332 Minnesota St, Ste W1390 St. Paul, MN 55101	Electronic Service	No	GEN_SL_Otter Tail Power Company_2018 SRSQ Report
Cary	Stephenson	cStephenson@otpco.com	Otter Tail Power Company	215 South Cascade Street Fergus Falls, MN 56537	Electronic Service	No	GEN_SL_Otter Tail Power Company_2018 SRSQ Report
Stuart	Tommerdahl	stommerdahl@otpco.com	Otter Tail Power Company	215 S Cascade St PO Box 496 Fergus Falls, MN 56537	Electronic Service	No	GEN_SL_Otter Tail Power Company_2018 SRSQ Report
Daniel P	Wolf	dan.wolf@state.mn.us	Public Utilities Commission	121 7th Place East Suite 350 St. Paul, MN 551012147	Electronic Service	No	GEN_SL_Otter Tail Power Company_2018 SRSQ Report