

**Minnesota Public Utilities Commission**  
*Staff Briefing Papers*

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Meeting Date: **December 12, 2013** ..... \*Agenda Item # 4

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Companies: Otter Tail Power Company

Docket No. E017/M-13-253

In the Matter of Otter Tail Power Company's ( "Otter Tail") 2012 Annual Safety, Reliability, Service Quality Report, and Proposed Annual Reliability Standards for 2013.

Issues: Should the Commission Accept Otter Tail's Safety, Reliability, Service Quality Reports for 2012 and Its Proposed Annual Reliability Standards for 2013?

Staff: Marc Fournier .....651-201-2214

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***Relevant Documents***

Commission Order Approving Reports,  
Setting 2012 Reliability Standards, and  
Setting Filing Requirements Docket No. E017/M-12-325 ..... December 20, 2012

Otter Tail Power's Initial Filing  
2012 Safety, Reliability and Service Quality  
Standards Report and Proposed  
SAIFI, SAIDI, and CAIDI Indices for 2013..... April 1, 2013

Comments of the Minnesota Department of Commerce  
Division of Energy Resources. ....July 31, 2013

Reply Comments Otter Tail Power Company. ....August 12, 2013

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The attached materials are workpapers of the Commission Staff. They are intended for use by the Public Utilities Commission and are based upon information already in the record unless noted otherwise.

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### **Statement of the Issues**

Should the Commission accept Otter Tail's Safety, Reliability, and Service Quality Reports for 2012?

Should the Commission accept Otter Tail's proposed annual reliability standards for 2013?

### **Background**

Minnesota Statute 216B.029 Standards for Distribution Utilities stipulates that the Commission shall adopt standards for safety, reliability, and service quality for distribution utilities.

Minnesota Rules Chapter 7826 were developed as a means for the Commission to establish safety, reliability, and service quality standards for electric distribution utilities and to monitor the performance of each utility as measured against those standards. There are three main annual reporting requirements set forth in the rule. These are:

1. The annual safety report (Minnesota Rules Part 7826.0400);
2. The annual reliability report (Minnesota Rules Parts 7826.0500, subp.1 and 7826.0600, subp. 1); and
3. The annual service quality report (Minnesota Rules Part 7826.1300).

These rules became effective on January 28, 2003. On April 1, 2013, Otter Tail filed its annual Electric Safety, Reliability, and Service Quality Performance Report and its request for approval of proposed reliability standards.

#### *Reliability Report*

Minnesota Rules part 7826.0500 require Otter Tail's reliability report to include, among other requirements:

- A. the utility's SAIDI for the calendar year, by work center and for its assigned service area as a whole;
- B. the utility's SAIFI for the calendar year, by work center and for its assigned service area as a whole;
- C. the utility's CAIDI for the calendar year, by work center and for its assigned service area as a whole;
- D. an explanation of how the utility normalizes its reliability data to account for major storms; and

- E. an action plan for remedying any failure to comply with the reliability standards set forth in part 7826.0600 or an explanation as to why noncompliance was unavoidable under the circumstances.

Recognizing that not all utilities would have the complete information required by the rules available for the first year the reports were due on April 1, 2003, the rules allowed for more limited initial reporting requirements. Utilities were required to file historical data and proposed reliability standards for SAIDI, SAIFI, and CAIDI, and the Commission established performance standards based on those initial reports.

### **Reliability Definitions:**

**SAIDI** means the System Average Interruption Duration Index and measures the average customer minutes of interruptions per customer. It is derived by dividing the annual sum of customer minutes of interruption by the average number of customers served during the year.

$$\text{SAIDI} = \text{Total Customer Minutes of Sustained Outages} \div \text{Number of Customers}$$

**SAIFI** means the System Average Interruption Frequency Index and measures the average number of interruptions per customer per year. It is derived by dividing the total annual number of customer interruptions by the average number of customers served during the year.

$$\text{SAIFI} = \text{Total Number of Sustained Customer Interruptions} \div \text{Number of Customers}$$

**CAIDI** means Customer Average Interruption Duration Index and is measured by the average customer minutes of interruption per customer interruption. It approximates the average length of time required to complete service restoration.

$$\text{CAIDI} = \text{Total Customer Minutes of Sustained Outages} \div \text{Total number of Sustained Customer Interruptions} = \text{SAIDI} \div \text{SAIFI}$$

**Interruption** means an interruption of electricity service to a customer greater than five minutes in duration.

**Major Service Interruption** means an interruption of service at the feeder level or above and affecting 500 or more customers for one or more hours.

**Storm-normalized data** means data that has been adjusted to neutralize the effects of outages due to major storms.

Since 2003, the Commission has adopted measures to make the annual reports more comprehensive and useful for the Commission and the utilities. Staff has been focused especially on measures that will lead to improved service quality and reliability and that will allow improvements to be monitored.

On December 20, 2012, in Docket No. E-002/M-12-313, the Commission ordered, in regard to the reliability report due April 1, 2013, that OTTER TAIL shall include:

- a. a description of the policies, procedures, and actions that it has implemented, and plans to implement, to assure reliability, including information demonstrating proactive management of the system as a whole, increased reliability, and active contingency planning.
- b. 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.
- c. a comparison of the results of using the IEEE 2.5 beta method and its former method of storm normalization.
- d. a report on the major causes of outages for major event days.

The Department’s July 31, 2013 comments provide a thorough summary and analysis of Otter Tail’s filing, most of which will not be repeated here. Staff will focus primarily on the Reliability portion of Otter Tail’s report.

In its December 20, 2012 Order, the Commission set Otter Tail’s 2012 reliability standards at the following levels:

<b>Work Center</b>	<b>SAIDI</b>	<b>SAIFI</b>	<b>CAIDI</b>
Bemidji	58.74	1.16	50.64
Crookston	48.58	0.93	52.24
Fergus Falls	69.16	1.17	59.11
Milbank	59.24	1.57	37.73
Morris	55.71	1.12	49.74
Wahpeton	57.00	1.15	49.57

Otter Tail’s reliability report provided the following information regarding Otter Tail’s 2012 reliability performance:

<b>Customer Service Center</b>	<b>SAIDI</b>		<b>SAIFI</b>		<b>CAIDI</b>	
	Standard	Performance	Standard	Performance	Standard	Performance

Bemidji	58.74	<b>108.81</b>	1.16	1.12	50.64	<b>96.78</b>
Crookston	48.58	<b>139.89</b>	0.93	<b>2.24</b>	52.24	<b>62.36</b>
Fergus Falls	69.16	55.05	1.17	1.12	59.11	49.08
Milbank	59.24	<b>81.25</b>	1.57	1.26	37.73	<b>64.65</b>
Morris	55.71	<b>67.12</b>	1.12	1.03	49.74	<b>65.38</b>
Wahpeton	57.00	34.41	1.15	1.05	49.57	32.64
MN Total		84.05		1.30		84.05

The numbers in bold indicate where Otter Tail did not meet its goals. Otter Tail stated in its report that its customers experienced 416 sustained interruptions throughout its service territory in 2012 and 241 (58%) of those interruptions were due to weather related events. Otter Tail stated the interruptions for one weather event in Bemidji were the result of storms that were more severe than what the electric system was designed to withstand.

The results for 2012 reveal that Bemidji, Crookston, Milbank, and Morris customer Service centers (CSC) did not meet the 2012 SAIDI reliability standards set by the Commission. In addition, the Crookston CSC was the only CSC to not meet the 2012 SAIFI reliability standards set by the Commission. Also, Otter Tail pointed out that Bemidji, Crookston, Milbank, and Morris CSC did not meet the 2012 CAIDI reliability standards set by the Commission.

Otter Tail reported the following in regard to outages and weather related outages for each work station as follows:

Work Station	Number of Interruptions	Interruptions Related to Weather	Percent of Interruptions-Weather Related
Bemidji	60	29	48.33%
Crookston	140	99	70.71%
Fergus Falls	119	57	47.90%
Milbank	4	2	50.00%
Morris	88	53	60.23%
Wahpeton	5	1	20.00%
<b>Total</b>	<b>416</b>	<b>241</b>	<b>57.93%</b>

### ***Storm Normalization Methodology***

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

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

### ***Action Plan to Improve Reliability***

When compared to 2011, Otter Tail's 2012 Minnesota reliability performance realized an improvement in SAIDI, CAIDI remained mostly constant, and SAIFI saw a slight increase. In 2012, Otter Tail's Minnesota customers experienced 416 sustained interruptions throughout its CSCs. Otter Tail believes that the inability to achieve the 2012 reliability standards, as set by the Commission, was largely due to events beyond our control. Reliable service is one of the Company's top priorities and Otter Tail indicated that it is cognizant that improvements in reliability will happen over longer periods of time and must be done cost effectively.

### ***Commission Consideration of OTTER TAIL's Proposed 2013 Reliability Standards***

Both Otter Tail and the DOC agree to set Otter Tail's performance standards for 2013 SAIDI, SAIFI, and CAIDI at the levels proposed by Otter Tail.

<b>Work Center</b>	<b>SAIDI</b>	<b>SAIFI</b>	<b>CAIDI</b>
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
<b>MN Total</b>	<b>64.95</b>	<b>1.13</b>	<b>57.48</b>

### **DOC**

As noted above, the Department provided a thorough summary and analysis of Otter Tail's Electric Safety, Reliability and Service Quality Performance Report and Petition. First, OTP did

not have trouble meeting the majority of its goals until 2010. In fact, most of the Company's goals were generally trending downward (becoming harder to achieve) until 2010. Second, there has been slight improvement in 2012 performance over 2010 and 2011. In 2012, Otter Tail met nine out of eighteen of its goals, or 50 percent, including all of its goals in the Fergus Falls and Wahpeton CSCs.<sup>1</sup>

Further, the DOC compared the Company's 2012 performance with its 2012 goals and 2013 proposed goals in the four CSCs where Otter Tail did not achieve all of its goals. While Otter Tail's proposed 2013 goals are generally higher (easier to achieve) than 2012 goals, the proposed goals would still exert pressure on the Company to perform better than it did in 2012. Since a trend of generally declining performance has not emerged as of yet, it is reasonable to continue to set reliability goals based on the five-year average for all of Otter Tail's work centers. The DOC recommends that the Commission accept the 2013 reliability goals proposed by Otter Tail.

The DOC will continue to carefully assess whether a declining trend in reliability performance develops. If OTP's 2013 performance is similar to 2010 or 2011 levels, the DOC may consider recommending that the Company's goals be frozen at 2013 levels until performance improves.

OTP calculated its 2012 SAIDI, SAIFI, and CAIDI indices using the IEEE 2.5 beta method for storm normalization. The Company noted that results using the IEEE 2.5 beta method were different in the Bemidji and Fergus Falls customer service centers (CSCs) compared to the results using OTP's former method of storm normalization (i.e., eliminating interruptions to feeders that exceeded 24 continuous hours when caused by weather). The resulting indices were not appreciably different, with the exception of the Bemidji work center in which the former method resulted in much higher (worse) results. OTP reported that under the IEEE 2.5 beta method, one storm on July 2, 2012 met the criteria to be excluded as a major event day.

The DOC recommends that the Commission accept Otter Tail's filing in fulfillment of the requirements of Minnesota Rules, Chapter 7826 and the Commission's December 20, 2012 Order. The DOC also recommends that the Commission set the Company's reliability standards for 2013 as proposed by Otter Tail.

### **Otter Tail Reply**

The DOC requested Otter Tail provide an update on actions Otter Tail has identified or taken to improve reliability in the Morris Customer Service Center ("CSC"). In Otter Tail's initial filing in this matter, the Company reported the snow conditions in the Morris CSC had slowed down the line inspection and investigation process. The colder than normal spring temperatures continued to delay the snow melt, which resulted in a continued delay in the timing of completing line inspections. The delay in the completion of the line inspections also caused a shift in the timing of analyzing, reviewing and prioritizing projects to address reliability across Otter Tail entire system.

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<sup>1</sup>Since 2006, OTP has met 60% of its standards. This compares to 38% for IPL, 80% for MP, 60% for NWEA, and 58% for Xcel over similar periods.



Otter Tail recently completed line inspections in the Morris CSC and are in the process of reviewing and identifying potential future improvements. Potential future improvements will be prioritized along with other reliability improvement projects across Otter Tail's entire system and Otter Tail will provide the details in its 2013 safety, reliability and service quality report.

### **Staff Analysis**

Staff appreciates the effort by Otter Tail in its 2012 Annual Safety, Reliability and Service Quality Reports which continues to provide informative data that promotes focused decision making as it relates to reliability. Staff believes that Otter Tail's April 1, 2013 filing of its Safety, Reliability, and Service Quality Reports for 2012 complies with the applicable rules and Commission Orders.

The DOC examined all the factors required by the rules. Staff will concentrate its comments on the reliability factors. Staff believes the DOC did an outstanding job in analyzing and reviewing the information contained in the submitted annual reports and will not repeat those efforts here. Staff concurs with the findings by DOC.

The purpose of the reliability statutes is to assure the Commission that reasonable standards of reliability performance are being properly measured and maintained. Further, since the reliability reporting is a relatively new reporting requirement, it is incumbent upon each utility to report the required data in a format that is consistent, from one reporting year to the next.

When Minnesota Rules, Chapter 7826 first went into effect in 2003, the Commission recognized that utilities would not have complete information to implement performance standards. The Commission required utilities to file historical data in regard to SAIDI, SAIFI, and CAIDI, and the Commission established performance standards based on those initial reports. Staff agrees that using a five year rolling average provided a useful baseline of information for the reports.

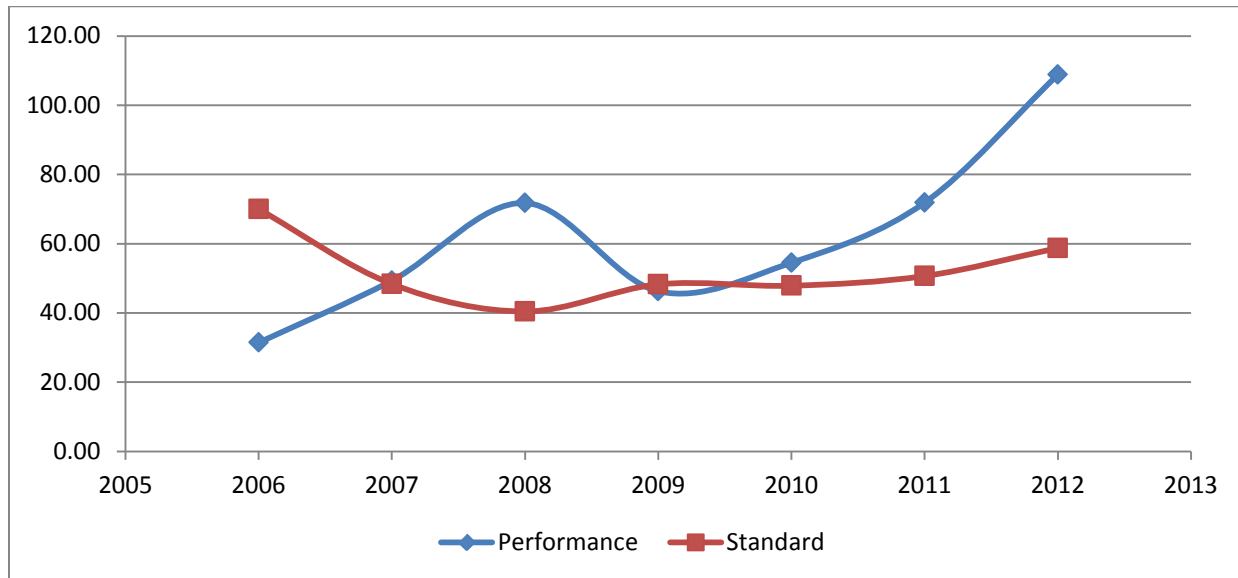
Otter Tail recommended and DOC agreed the Commission adopt the following for 2013 reliability standards:

<b>Work Center</b>	<b>SAIDI</b>	<b>SAIFI</b>	<b>CAIDI</b>
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
<b>MN Total</b>	<b>64.95</b>	<b>1.13</b>	<b>57.48</b>

The graphs below depict Otter Tail's past performance versus standards since 2006 for the Bemidji

CSC:

**Bemidji CSC SAIDI Performance and Standards**



The Bemidji CSC experienced 47 sustained interruptions in 2012. The 2012 storm normalization SAIDI was 108.81 minutes compared to the standard of 58.74. The greatest impact to SAIDI results in the Bemidji CSC was several large storm systems on July 2<sup>nd</sup> and 3<sup>rd</sup>. The Bemidji area experienced straight line winds in excess of 80 miles per hour. Subsequent storms followed with 60 mph winds. These winds caused many very large trees, located outside of Otter Tail’s easement area, to be up-rooted and come into contact with Otter Tail’s facilities. At one point, 6070 customers were without power due to downed distribution lines and poles. The 2.5 beta storm normalization process eliminated July 2<sup>nd</sup>. However, subsequent strong storms, the next day, continued to impact the system. The most impacting interruption came on July 3<sup>rd</sup>. The Cass Lake North Feeder, serving 407 customers, experienced a 23 hour and 51 minute interruption, accounting for 582,220 customer minutes. The extensive damages caused by these storm system required portions of the electric delivery system in this area to be rebuilt. The sustained very high winds and other effects of the storm systems were in some cases more severe than what the electric system was designed to withstand. Many of the interruptions caused by these storms were not within Otter Tail’s control.

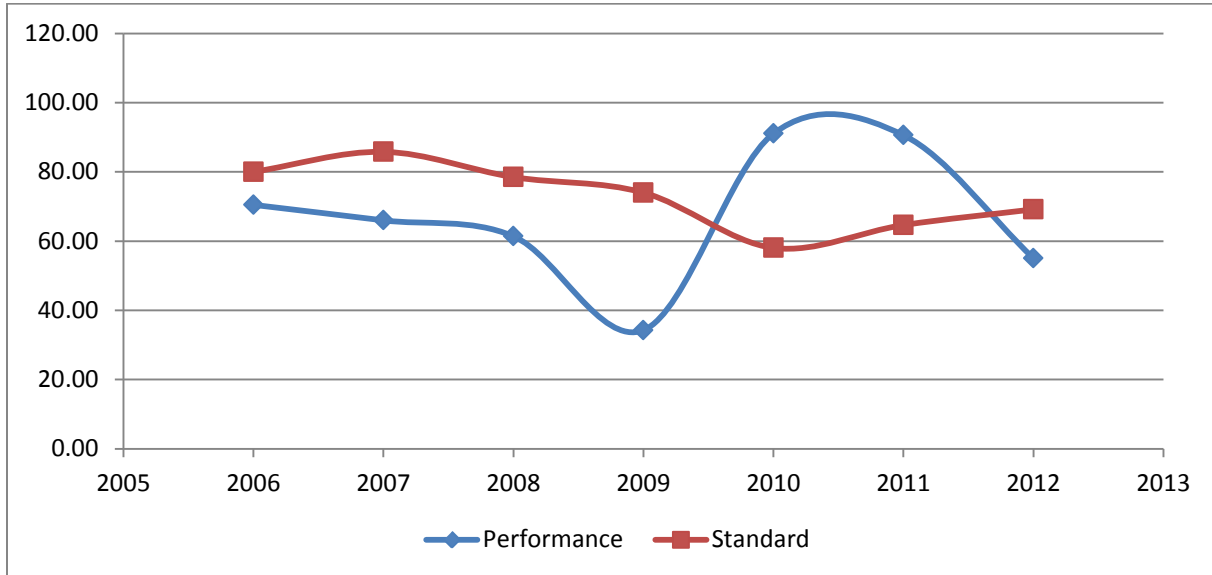
The graphs below depict Otter Tail’s past performance versus standards since 2006 for the Bemidji CSC:

**Crookston CSC SAIDI Performance and Standards**



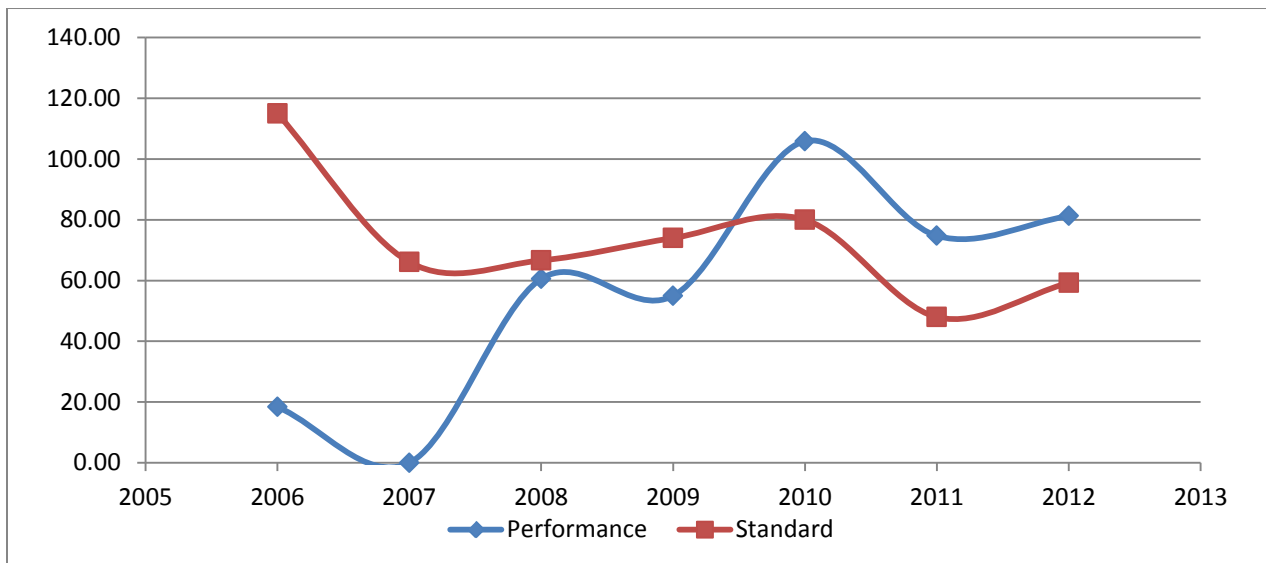
The Crookston CSC experienced 141 sustained interruptions in 2012 yielding a SAIDI of 139.89 minutes compared to the standard of 48.58. Two events were the main causes for not achieving the SAIDI standard. On October 2, 2012 Kittson, Marshall, Pennington, Beltrami, and other counties were impacted by wildfires, even forcing the evacuation of Karlstad and destroying several buildings. Due to this event, Otter Tail had to switch out the 69 KV transmissionline serving the area at the height of the fire. The fire burned woods, grasslands, and peat bogs, and was accelerated due to very dry conditions and high winds. On October 4, 2012 a severe snow and ice storm hit the Crookston area. The fire impacted area received up to 15 inches of wet heavy snow. The snow caused multiple downed distribution lines. Heavy smoke debris along with damp conditions caused multiple insulator failures within the system in this area. Overall, 66 sustained interruptions occurred during this event, accounting for 971,972 customer minutes. Poor visibility, blizzard like conditions, and heavy wet snow made it extremely difficult for Otter Tail employees to safely travel to restore service to our customers. There were no actions Otter Tail could have taken to prevent the several interruptions caused by the events on October 2 - 4, 2012.

**Fergus Falls CSC SAIDI Performance and Standards**



In 2012, Otter Tail beat the performance standard by 14 minutes in the Fergus Falls CSC.

**Milbank CSC SAIDI Performance and Standard**



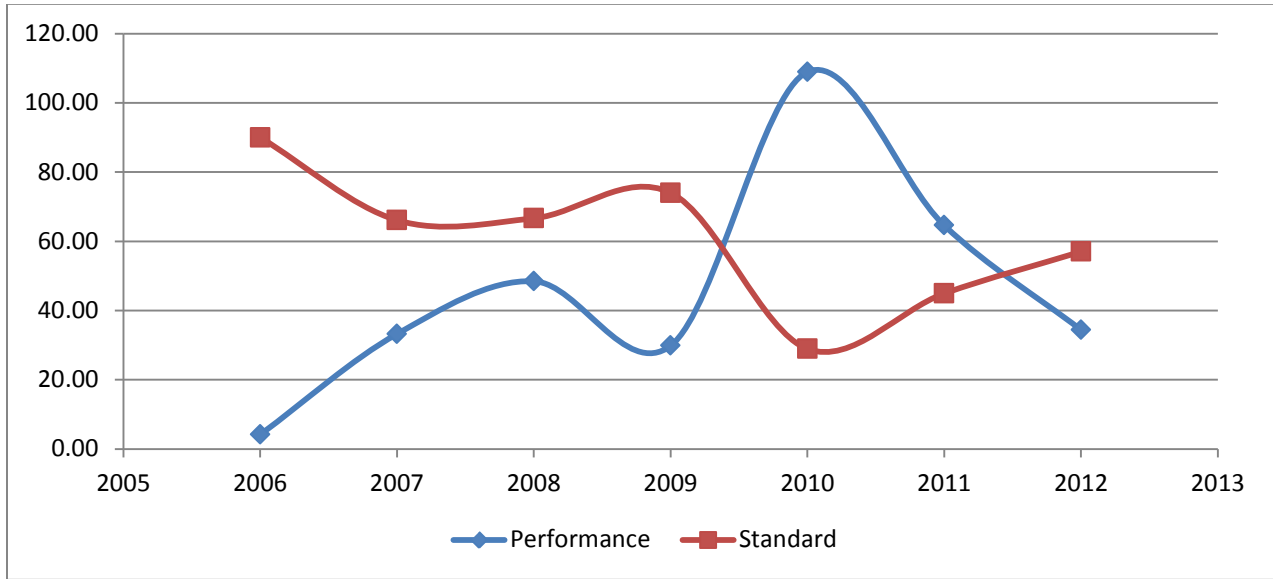
The Milbank CSC serves 724 Minnesota Customers from five distribution feeders. Those five Milbank CSC feeders, experienced four sustained interruptions in 2012, resulting in a SAIDI of 81.25 minutes compared to the standard of 59.24 minutes. On December 24, 2012, a car struck and knocked down a pole in Beardsley, Minnesota, accounting for two feeder interruptions totaling 40,916 customer minutes. Without this event, Minnesota Customers fed out the Milbank CSC would have had a SAIDI of 24.7 minutes, which would have resulted in meeting the standard of 59.24 minutes. CAIDI would have been 39.38 minutes and very close to the standard of 37.73 minutes. There is nothing Otter Tail could have done to prevent this car from hitting the pole.

**Morris CSC SAIDI Performance and Standard**



The Morris CSC experienced 89 sustained interruptions in 2012, resulting in a SAIDI of 67.12 minutes compared to the standard of 55.71 minutes. A devastating storm, on June 17, 2012, hit the region with wind gusts in excess of 75 miles an hour recorded at the Appleton Municipal Airport. Nine sustained interruptions occurred in the Appleton and Holloway areas. The most impactful was an eight hour and three minute interruption on the Appleton East Feeder, interrupting 742 customers. In addition to causing extensive damage to overhead distribution facilities, excessive winds and reported funnels knocked down ten 41.6 KV transmission poles and lines with distribution under build. Excluding this event from 2012 performance produces a SAIDI of 36.5 minutes which is within the standard of 55.71 minutes. Winds of this scale exceed the Company’s design requirements for pole and line loadings. Therefore the interruptions caused by this event were beyond Otter Tail’s control.

### Wahpeton CSC SAIDI Performance and Standard



In 2012, Otter Tail beat the performance standard by 22.59 minutes in the Wahpeton CSC.

**Commission Options**

- I. Whether the Commission should accept Otter Tail’s Reports on 2012 Results?
  - A. Accept Otter Tail’s April 1, 2013 safety, reliability and service quality reports, as complying with Minn. Rules, Chapter 7826 and relevant Commission orders.
  - B. Do not accept Otter Tail’s April 1, 2013 safety, reliability and service quality reports, as complying with Minn. Rules, Chapter 7826 and relevant Commission orders.
  
- II. Whether the Commission should Accept Otter Tail’s proposed reliability standards for 2013?
  - A. Accept Otter Tail’s 2013 proposed reliability standards at the levels indicated below:

<b>Work Center</b>	<b>SAIDI</b>	<b>SAIFI</b>	<b>CAIDI</b>
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
<b>MN Total</b>	<b>64.95</b>	<b>1.13</b>	<b>57.48</b>

- B. Accept some other reliability standard for 2013.
  
- III. Additional Issues for Reports due April 1, 2014
 

The Commission could adopt all, some, or none of the following:

  - A. Continue to require Otter Tail to augment their next filing to include a description of the policies, procedures and actions that it has implemented, and plans to implement, to assure reliability, including information on how it is demonstrating pro-active management of the system as a whole, increased reliability and active contingency planning;
  - B. Continue to require Otter Tail to incorporate into its next filing 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;

- C. Continue to require Otter Tail to report on the major causes of outages for major event days.

***Recommendation***

Staff recommends I A, II A, III A, B, and C.