Minnesota Public Utilities Commission

Staff Briefing Papers

Meeting Date: **December 4, 2014** .....*Agenda Item #10

Companies: Northern States Power Company dba Xcel Energy

Docket No. E002/M-14-131

In the Matter of Xcel Energy's (Xcel) 2013 Annual Safety, Reliability, Service Quality Report, and Proposed Annual Reliability Standards for 2014.

Issues: Should the Commission Accept Xcel's Safety, Reliability, service Quality Reports for 2013 and Its Proposed Annual Reliability Standards for 2014?

Should the Commission accept Xcel's proposed annual reliability standards for 2014?

Staff: Marc Fournier 651-201-2214

Relevant Documents

Commission Order Accepting Reports,
Setting 2013 Reliability Standards, Requiring Filings Requirements,
And Requiring Collaboration and Study
Docket No. E002/M-13-255 ..... January 13, 2014

Xcel Energy's Initial Filing
2013 Safety, Reliability and Service Quality
Standards Report and Proposed
SAIFI, SAIDI, and CAIDI Indices for 2014..... April 1, 2014

Comments of the Minnesota Department of Commerce
Division of Energy Resources. ..... June 30, 2014

Reply Comments Xcel Energy.....July 25, 2014

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 Xcel's Safety, Reliability, and Service Quality Reports for 2013?

Should the Commission accept Xcel's proposed annual reliability standards for 2014?

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, 2014, XCEL 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 XCEL'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.

SAIDI = Total Customer Minutes of Sustained Outages ÷ 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.

SAIFI = Total Number of Sustained Customer Interruptions ÷ 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.

CAIDI = Total Customer Minutes of Sustained Outages ÷ Total number of Sustained Customer Interruptions = SAIDI ÷ 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 January 13, 2014, in Docket No. E-002/M-13-255, the Commission ordered, in regard to the reliability report due April 1, 2014, that XCEL 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 (or summary information in some other format) that allows the reader to more easily assess the overall reliability of the system and identify the main factors that affect reliability;

c. a report on the major causes of outages for major event days.

d. Xcel shall consider other factors, in addition to historical data, on which to base its reliability indices for 2013 in an effort to demonstrate its commitment toward improving reliability performance.

e. Xcel shall continue its efforts in the reporting of major service interruptions to the Commission's Consumer Affairs Office.

f. Xcel shall file any documentation provided to the city of Minneapolis related to the issues raised in this docket as an informational filing.

Xcel's 2013 ELECTRIC SAFETY, RELIABILITY AND SERVICE QUALITY REPORT AND COMMISSION CONSIDERATION OF PROPOSED RELIABILITY STANDARDS FOR 2014

The Department's June 30, 2014 comments provide a thorough summary and analysis of Xcel's filing, most of which will not be repeated here. Staff will focus primarily on the Reliability portion of XCEL's report.

In its January 13, 2014 Order, the Commission set XCEL's 2013 reliability standards at the following levels:

Work Center	SAIDI	SAIFI	CAIDI
Metro East	85.44	0.94	90.75
Metro West	97.92	0.98	100.17
Northwest	102.56	0.87	117.94
Southeast	78.16	0.71	109.97

Xcel's Reliability report provided the following information regarding Xcel's 2013 reliability

performance:

Work Center	SAIDI		SAIFI		CAIDI	
	Standard	Performance	Standard	Performance	Standard	Performance
Metro East	85.44	81.28	0.94	0.83	90.75	**97.75**
Metro West	97.92	**98.71**	0.98	0.94	100.17	**105.00**
Northwest	102.56	95.90	0.87	**0.93**	117.94	102.86
Southeast	78.16	**108.8**	0.71	**0.75**	109.97	**145.1**

The numbers in bold indicate performance that did not meet goals. Xcel missed System Average Interruption Duration Index (SAIDI) and Customer Average Interruption Duration Index (CAIDI) goals in two of its four work centers. The Metro East work center missed only the CAIDI goal, and the Northwest work center missed only the SAIFI goal in 2013. However, the Southeast work center missed every goal in 2013.

Storm Normalization Methodology

For 2013, the Company used the following storm day threshold calculation procedures:

- Using the previous five years of outage history for each region, Xcel:
  - Calculate the number of sustained outages per day;
  - Calculate the average number of sustained outages per day; and
  - Calculate the standard deviation of sustained outages per day.
- Based on the above methodology, Xcel sets a unique storm day threshold for each region. A storm day is defined as any day meeting or exceeding the average number of sustained outages per day plus three standard deviations.

Action Plan to Improve Reliability

Due to the fact that these goals are five-year averages, the expectation is to achieve target results 50 percent of the time and miss the target 50 percent of the time. Taken together, several days of storms that cause extensive outages but do not qualify for storm days can quickly erode a standard that is based on average performance. The Company indicated that several of its missed standards this year were missed by narrow amounts that cannot be explained by any one large event, but rather a few small events over the course of the year.

The Company will continue its on-going assessments of reliability, seeking to implement system improvements and maintenance to achieve the largest improvements in reliability measurements. The Company indicated that it is committed to providing reliable service to customers and

provided a discussion of individual work centers.

1. Metro East

The CAIDI for the Metro East work center exceeded the threshold by 7 minutes. In examining the outages in the Metro East work center which caused these thresholds to be exceeded, the Company found that there was not one large event that caused this but several small events each contributing less than two minutes to the total CAIDI over the course of the year.

2. Metro West

The SAIDI performance in the Metro West work center exceeded the threshold by less than a minute and our CAIDI by 4.92 minutes. The SAIDI was narrowly missed by less than one percent of the standard. The CAIDI performance can be attributed to a few events including two cable failures in June and a connector failure on August 5, 2013 that caused a feeder level outage.

3. Northwest

SAIFI for the Northwest work center region exceeded the threshold by .06 interruptions. This is very close to the goal considering that it is based on a five-year average. However, an analysis of the data found that one event caused by a cable failure contributed .04 interruptions to the overall SAIFI which is more than 60 percent of the SAIFI threshold gap.

4. Southeast

The SAIDI and CAIDI performance in the Southeast work center exceeded the threshold by 30.67 and 35.14 minutes, respectively. In 2013, there were five significant conductor galloping events caused by high winds in April, August and October that accounted for approximately 15 minutes of total SAIDI and CAIDI. These were all lengthy feeder outages with a great deal of territory to cover to find the issue. In addition, there was a substation level outage in May caused by animal contact which contributed nearly 8 minutes to our SAIDI and nearly 2 minutes to CAIDI. The SAIFI performance narrowly missed the threshold by .04 interruptions. The substation outage in May mentioned above contributed .05 interruptions alone to SAIFI.

In the Southeast, the Company has taken a few additional steps to improve performance. For instance, in 2013, the Southeast region experienced several significant substation outages that negatively affected CAIDI. While normally a substation outage has a positive effect on CAIDI, in these 2013 cases the specialized personnel required to restore service was outside the normal service territory attending to other duties. The travel time necessary for the specialized personnel to reach these substation outages negatively affected CAIDI for 2013.

As such, the Company has begun training additional personnel to perform these specialized substation outage activities. Other process improvements which should increase performance in the Southeast region include training all line personnel as part of the “restore before repair” initiative discussed above. The Company indicated that it is committed to better managing

vacations and time away from normal work locations to ensure that trained and qualified personnel are available to restore service when needed.

In addition, parts of the Southeast Region experienced significant outages due to the ice storm on April 9-10. These two days negatively impacted the Southeast Region CAIDI by approximately 25 minutes. Although this ice storm did not meet the technical threshold for exclusion, these storm conditions did cause a considerable damage to the system and created difficult and slow working conditions. Without this severe weather event, Southeast Region CAIDI would not have increased over 2012.

In addressing the lack of improvement in CAIDI performance over the last eight years generally, the Company provided an explanation of how it intends to improve that performance. The Company formed a CAIDI improvement team made up of employees from the Engineering, Construction, Control Center and Trouble operations groups to examine causes and to develop solutions to improve CAIDI performance. The team began meeting monthly in the first quarter of 2014 and is developing a CAIDI reduction plan. The Company discusses some of the factors identified by the team which impact CAIDI improvement as follows:

Time Recording: When a crew has restored an outage, procedure dictates that they record the time at which the line was restored. However, the team discovered that crew-recorded data does not precisely match the actual times the meters were energized according to the recorded automated meter reading (AMR) data.

Restore before Repair: The CAIDI improvement team identified that a stronger focus on this process could have a positive impact. In the "restore before repair" process, the Distribution Control Centers isolate the fault, restore as many customers as possible through switching, and then patrol the rest of the circuit to finish repairs for the remaining customers.

Staffing Levels: When Company crews are at a scheduled appointment with a customer, they cannot always get to an outage immediately and still maintain a high level of customer service. A delay in reaching an outage results in lower CAIDI performance. As a result, the Company started to use contractors for some appointments so that the workforce remains at a steady level to meet non-outage customer expectations, while current specialized crews are available to respond to outages in a more timely fashion. The Company expects this practice to support the efforts of reducing CAIDI metrics, especially in work centers with a large service territory to cover.

Commission Consideration of XCEL's Proposed 2014 Reliability Standards

Xcel calculated the goals using the same methodology used to set the Company's 2013 goals. The SAIDI and SAIFI goals reflect the average of 5 years of actual performance, while the CAIDI goals reflect the mathematical relationship among the indices. The DOC noted a general upward trend of CAIDI goals but concurs with Xcel's calculation of its proposed 2014 goals and recommends that the Commission set the Company's goals as proposed.

Work Center	SAIDI	SAIFI	CAIDI
Metro East	82.41	0.88	93.72
Metro West	97.41	0.95	102.11
Northwest	90.27	0.81	111.70
Southeast	86.31	0.71	121.40

DOC

The DOC recommended that the Commission accept Xcel's filing in fulfillment of the requirements of Minnesota Rules, Chapter 7826 The Commission's December 12, 2012 Order in Docket No. E002/M-12-313, and the Commission's January 13, 2014 Order in Docket No. E002/M-13-255 pending the submission of additional information[1]:

1. a discussion regarding factors that could be responsible for the lack of improvement in CAIDI performance over the last eight years;

2. a discussion on its performance in the Southeast work center in as well as any specific measures it is taking to improve performance in this work center;

3. a discussion regarding the recurrence of similar issues for two of the worst performing feeders in 2012, and 2013 and the likelihood of this reoccurring in the future;

4. additional discussion regarding the increase in response time for commercial service extensions from 2009 – 2013;

5. a discussion regarding the causes for the large increase of major service interruptions in 2013; and

6. the reasons for the failure to meet the standards outlined in Minnesota Rules, part 7826.0900, subp. 1 in November of 2013 regarding percentage of meters read.

Additionally, the DOC recommended that the Commission set the Company's reliability standards for 2014 at the levels proposed by the Company.

Xcel Reply

Xcel requests that the Commission approve the Company's Annual Safety, Reliability, and Service Quality Report for 2013; and Petition for Approval of Reliability Goals for 2014, as

1 Xcel addressed each of these items in reply comments filed on July 25, 2014.

supplemented by the Reply Comments.

Staff Analysis

Staff appreciates the effort by Xcel in its 2013 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 Xcel's April 1, 2014 filing of its Safety, Reliability, and Service Quality Reports for 2013 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 statues 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.

Over the past six years, Xcel it met the standards 41 of 72 times, or 57 percent. In 2014, Xcel stated it met the standards 6 out of 12 times, or 50 percent of the time. Xcel based its proposed standards on the past five year rolling average for each work center, and, as noted above, Xcel stated that "[d]ue to the fact that these goals are five-year averages, we would expect to achieve target results 50 percent of the time and miss the target 50 percent of the time."

Given that the standards or goals are based on a five year average, it should come as no surprise that Xcel or any company meets the standards on either side of 50 percent. Assuming a normal probability distribution, there is an equal probability that that a given quality observation will be above or below the calculated average. As such, Xcel's performance should not be of great concern from a statistical perspective.

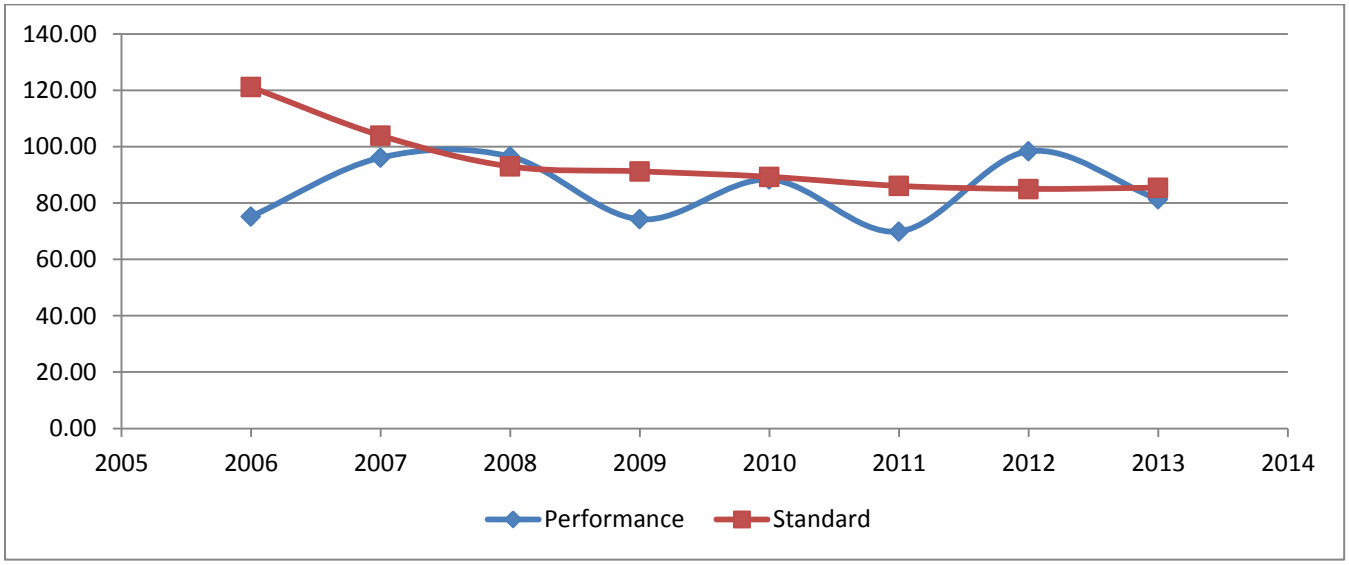
When Minnesota Rules, Chapter 7826 first went into effect in 2003, the Commission recognized that Utilities would not have complete information to implement performance standards. The Commission required utilities to file historical data in regard to SAIDI, SAIFI, and CAIDI, and the Commission established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

Xcel recommended and DOC agreed the Commission adopt the following for 2014 reliability standards:

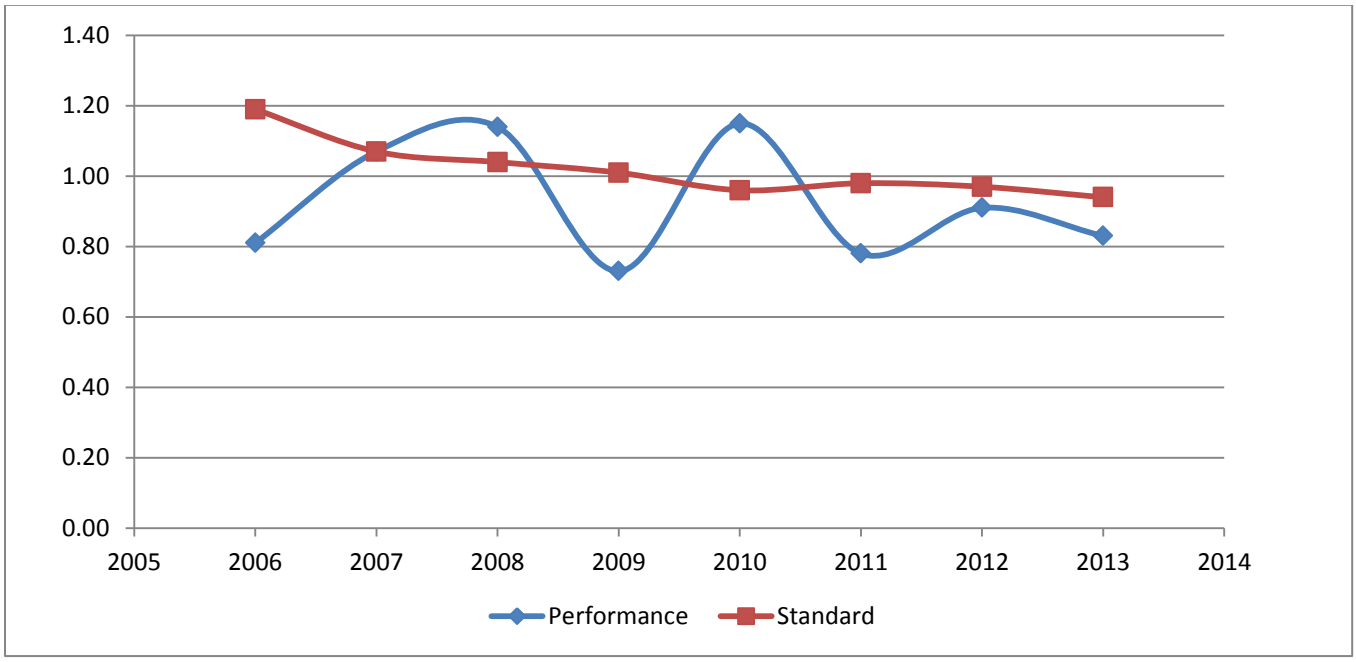
Work Center	SAIDI	SAIFI	CAIDI
Metro East	82.41	0.88	93.72
Metro West	97.41	0.95	102.11
Northwest	90.27	0.81	111.70
Southeast	86.31	0.71	121.40

The graphs below depict Xcel's past performance versus standards since 2003 for Metro East work centers:

Metro East SAIDI Performance and Standards



Metro East SAIFI Performance and Standards



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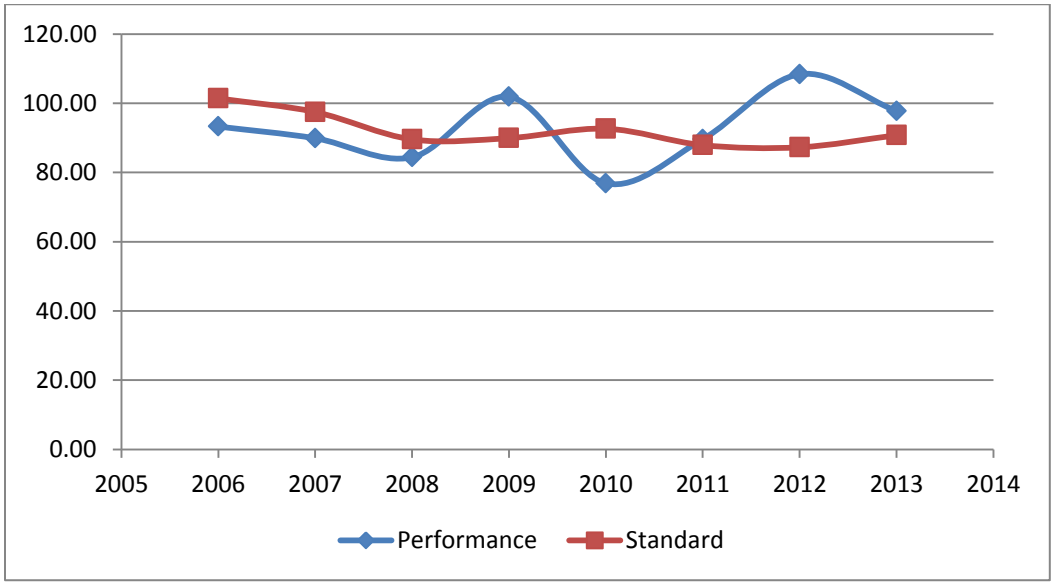

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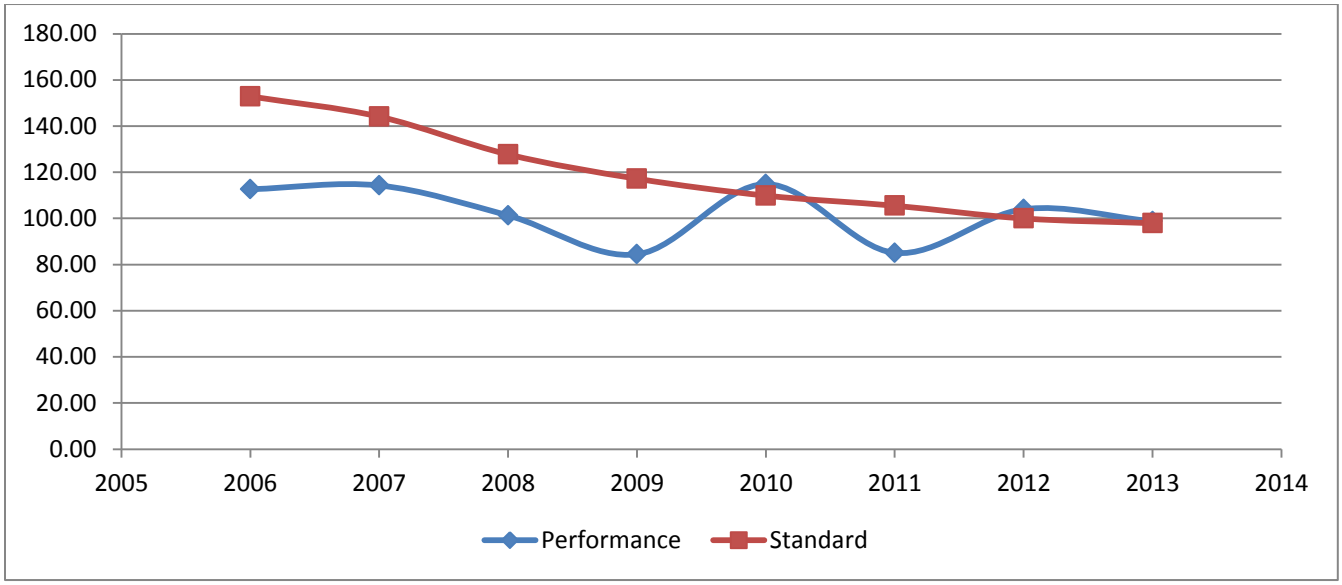
Metro West SAIDI Performance and Standard



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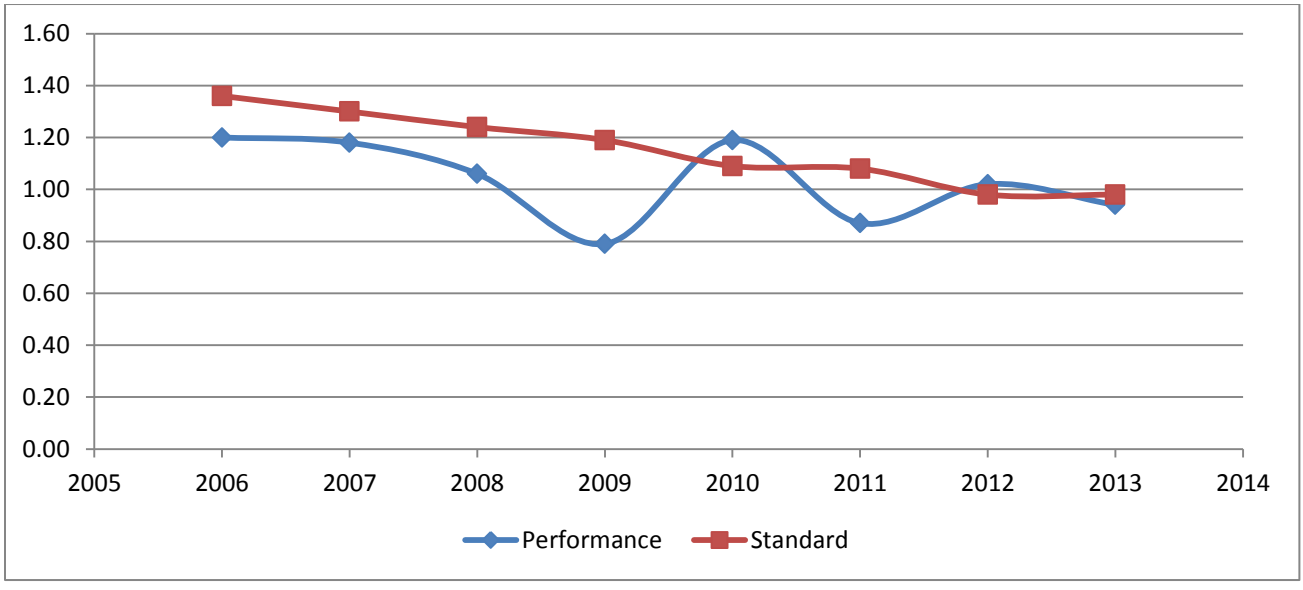

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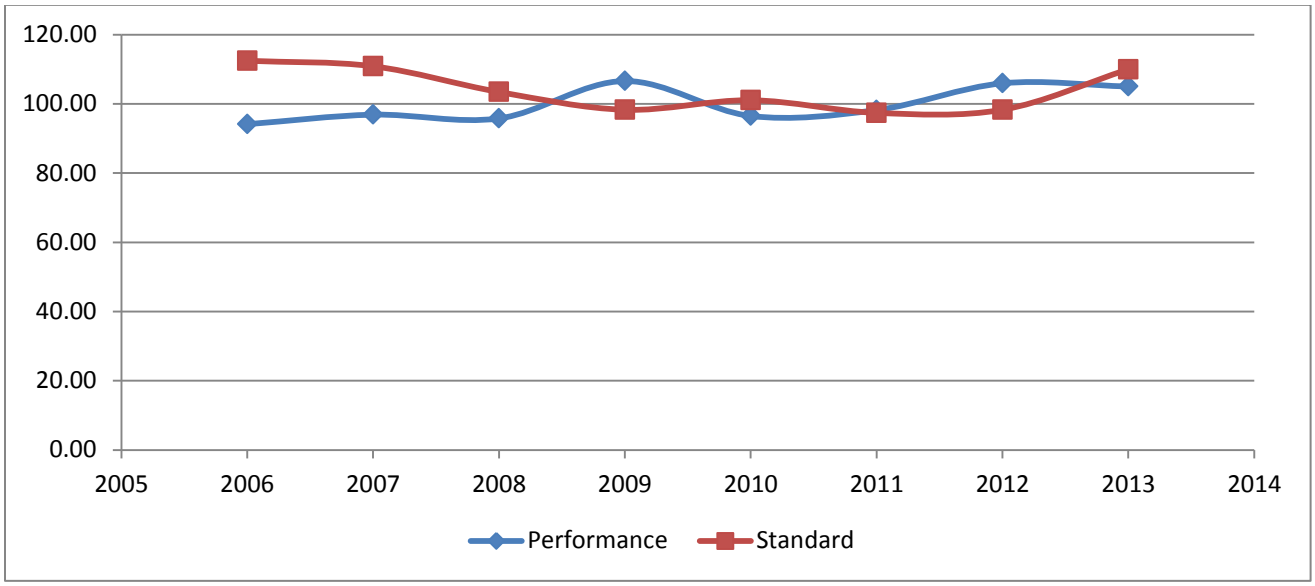

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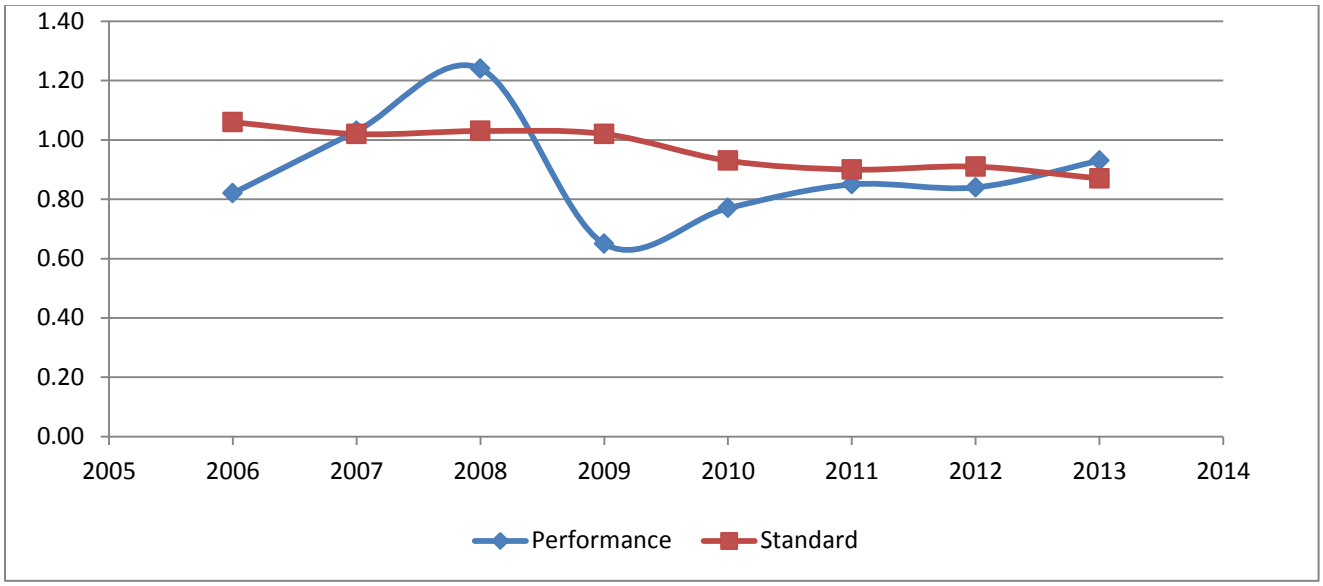
Northwest SAIDI Performance and Standards

Northwest SAIFI Performance and Standards



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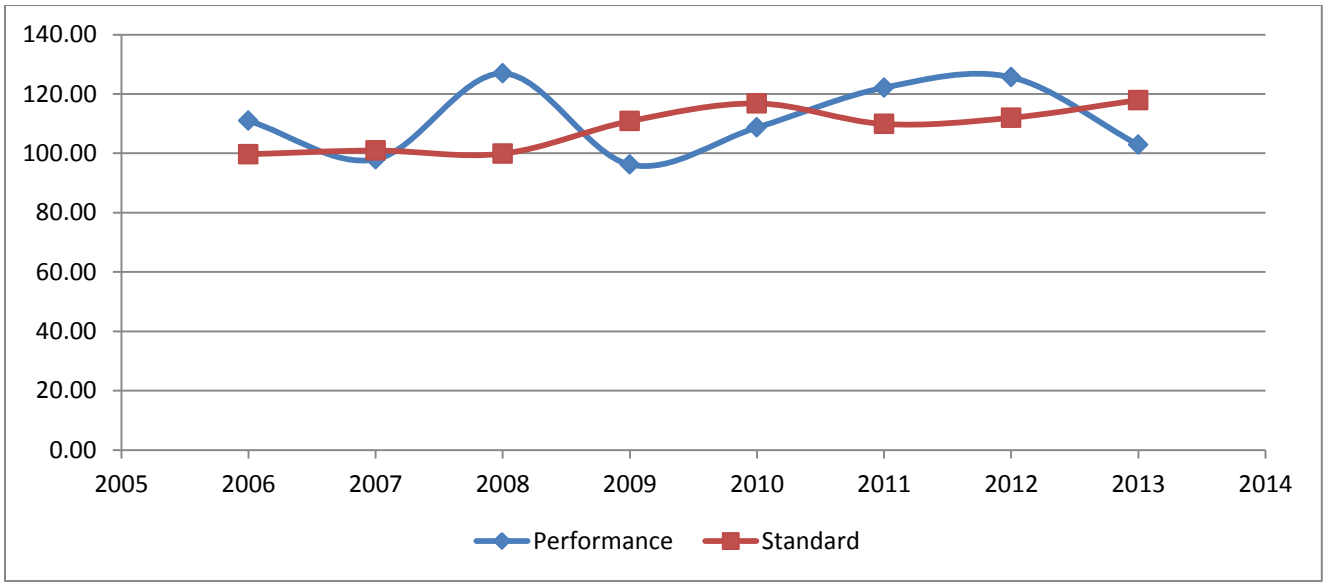

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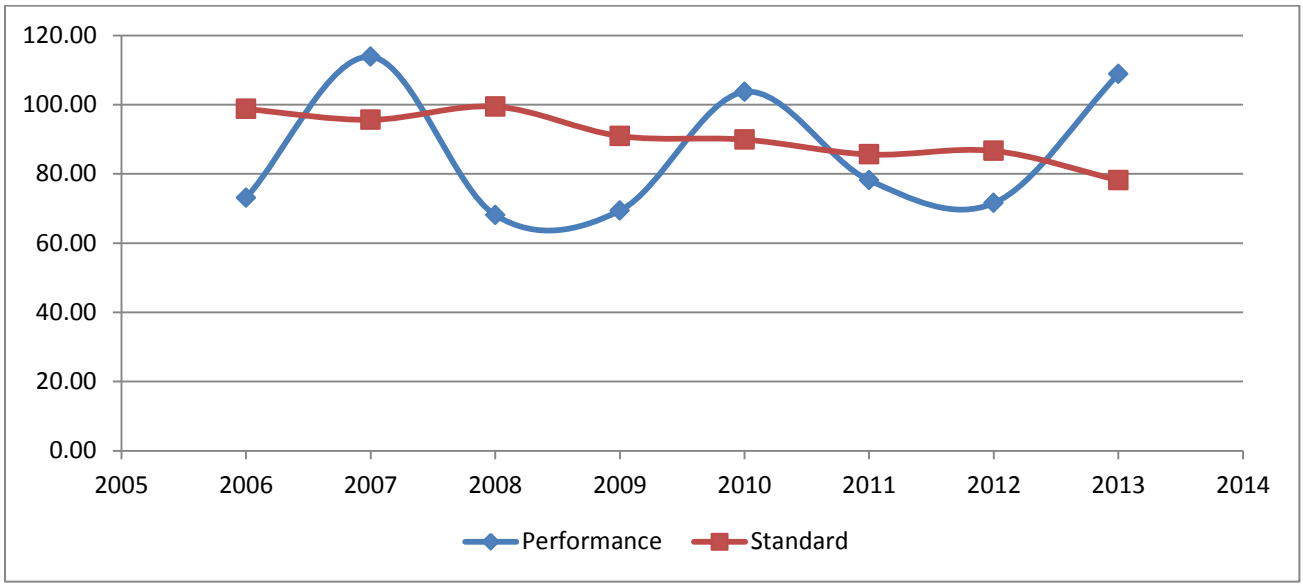
Southeast SAIDI Performance and Standards



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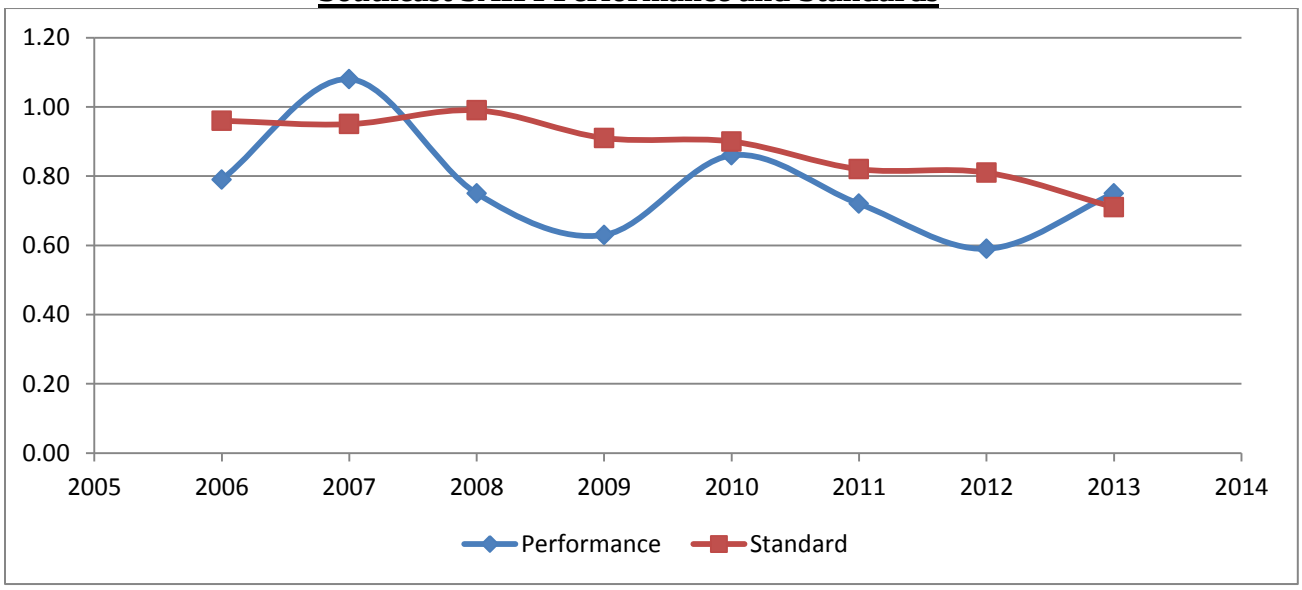

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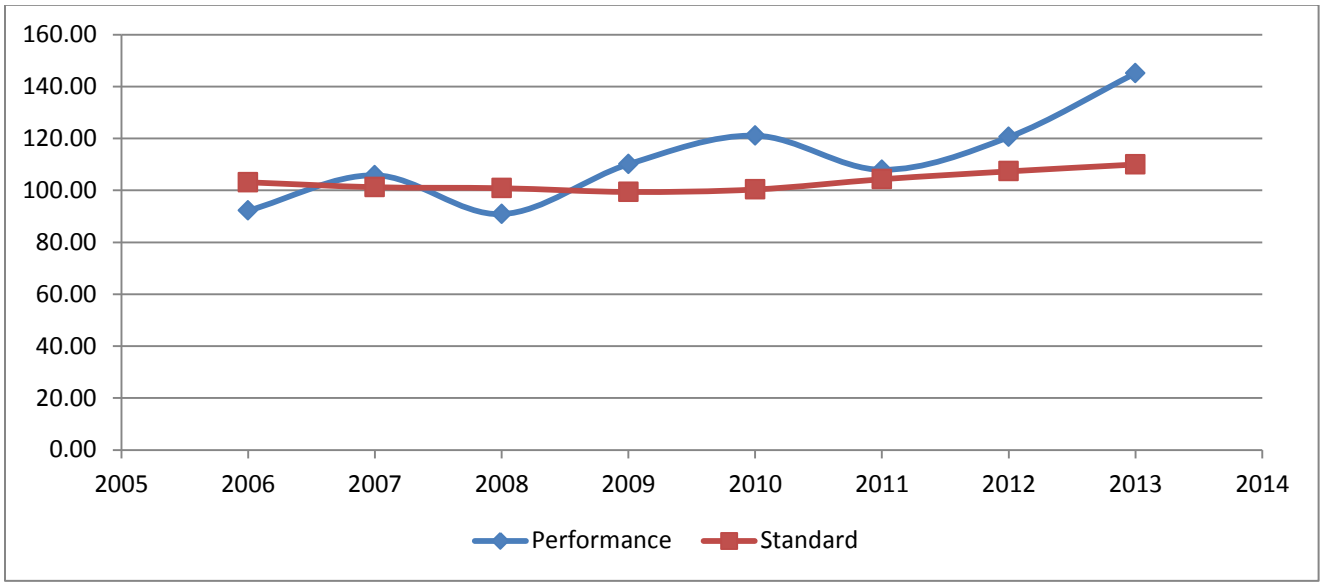

The SAIDI and CAIDI performance in the Southeast work center exceeded the threshold by 30.67 and 35.14 minutes, respectively. In 2013, there were five significant conductor galloping events caused by high winds in April, August and October that accounted for approximately 15 minutes of total SAIDI and CAIDI. These were all lengthy feeder outages with a great deal of territory to cover to find the issue. In addition, there was a substation level outage in May caused by animal contact which contributed nearly 8 minutes to our SAIDI and nearly 2 minutes to CAIDI. The SAIFI performance narrowly missed the threshold by .04 interruptions. The substation outage in May mentioned above contributed .05 interruptions alone to SAIFI.

Commission Options

I. Whether the Commission should accept Xcel's Reports on 2013 Results?

A. Approve Xcel's April 1, 2014 safety, reliability and service quality reports, as complying with Minn. Rules, Chapter 7826 and relevant Commission orders.

B. Do not approve Xcel's April 1, 2014 safety, reliability and service quality reports, as complying with Minn. Rules, Chapter 7826 and relevant Commission orders.

II. Whether the Commission should Accept Xcel's proposed reliability standards for 2014?

A. Approve Xcel's 2014 proposed reliability standards at the levels indicated below:

Work Center	**SAIDI**	**SAIFI**	**CAIDI**
Metro East	82.41	0.88	93.72
Metro West	97.41	0.95	102.11
Northwest	90.27	0.81	111.70
Southeast	86.31	0.71	121.40

B. Approve the goals or standards that were in effect in 2013 for 2014.

Work Center	**SAIDI**	**SAIFI**	**CAIDI**
Metro East	85.44	0.94	90.75
Metro West	97.92	0.98	100.17
Northwest	102.56	0.87	117.94
Southeast	78.16	0.71	109.97

III. Additional Issues for Reports due April 1, 2015

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

A. Continue to require Xcel 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 Xcel 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 Xcel to report on the major causes of outages for major event days.

D. Continue to require Xcel to consider other factors, in addition to historical data, on which to base its reliability indices for 2014 in an effort to demonstrate its commitment toward improving reliability performance; and

E. Require Xcel to continue its efforts in the reporting of major service interruptions to the Commission's CAO.

Recommendation

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