Minnesota Public Utilities Commission

Staff Briefing Papers

Meeting Date: **December 4, 2014** .....*Agenda Item #8

Companies: Minnesota Power

Docket No. E015/M-14-281

In the Matter of the Minnesota Power Company's (MP) 2013 Annual Safety, Reliability, Service Quality Report, and Proposed Annual Reliability Standards for 2014.

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

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

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Relevant Documents

Commission Order Accepting Reports,
Setting 2013 Reliability Standards, and
Requiring Filings Docket No. E015/M-13-254 ..... January 13, 2014

Minnesota Power Initial Filing 2014 Safety, Reliability and
Service Quality Standards Report. ..... April 1, 2014

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

Reply Comments of Minnesota Power. .....July 10, 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 MP's Safety, Reliability, and Service Quality Reports for 2013?

Should the Commission accept MP'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, MP 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 MP'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 on the service quality measures.

On January 13, 2014, in Docket No. E-015/M-13-254, the Commission ordered, in regard to the

reliability report due April 1, 2014, that MP shall:

a. augment its next annual 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 proactive management of the system as a whole, increased reliability, and active contingency planning;

b. incorporate into its next annual 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.

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

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

In its January 13, 2014 Order, the Commission set MP's 2013 reliability standards. MP's Reliability Report provided the following information in regard to MP's 2013 reliability performance in comparison to the 2013 standard:

	SAIDI	SAIFI	CAIDI
2013 Standard	90.6 or below	0.99 or below	91.52 or below
Actual 2013 Performance	120.43	1.14	105.64

MP stated its reliability performance statistics were calculated using the normalization process designed to remove all outage records attributed to a specific major event, such as a large storm.

Storm Normalization Methodology

MP stated that its storm normalization is based on the 2.5 beta method defined by the IEEE Standard for Distribution Reliability. Minnesota Power stated that normalization is performed only when the daily SAIDI is greater than the threshold for Major Event Days ("T_{MED}"). To determine which days to exclude from the reliability metrics, MP stated it queried its database for timeframes when the Company's SAIDI incurred an incremental increase above the threshold for T_{MED}.[1] MP stated, a threshold for a T_{MED} is computed once per year by assembling the 5 most recent years of historical values of daily SAIDI and computing a threshold based on the average and Standard deviation of the SAIDI value.[2] According to the Company, if any day in the next

1 Note that an excluded event is not limited to a single day and may span consecutive days depending on the severity of the event.

year has SAIDI greater than threshold values, it qualified as a T_{MED}. MP stated that in 2013, there was one major event excluded based on this method.

Action Plan to Improve Reliability

MP's system remained characteristically static throughout 2013. However, there was a substantial fluctuation in reliability statistics. Many of MP's outages were due to weather events, but more specifically, were caused by wind blowing trees down and into power lines. It was determined that the events were generally caused by very large trees well outside of the vegetation management clearances. Also, 2013 brought a large turnover in the Company's line personnel. While great efforts were made to keep a consistent staff of lineworkers, it was challenging to train lineworkers as quickly as turnover was occurring. Minnesota Power saw approximately a 20 percent turnover of the department personnel in 2013.

Commission Consideration of MP's Proposed 2014 Reliability Standards

	SAIDI	**SAIFI**	**CAIDI**
2014 Standard	97.50	1.02	95.59

DOC

As noted above, the Department provided a thorough summary and analysis of MP's Electric Safety, Reliability and Service Quality Performance Report and Petition. The DOC noted that MP failed to meet the goals for SAIDI, SAIFI, CAIDI for 2013.

The Department recommends that the Commission accept Minnesota Power's filing in fulfillment of the requirements of Minnesota Rules, Chapter 7826 and the Commission's January 13, 2014 Order. Additionally, the DOC recommends that the Commission set the Company's reliability standards for 2014 as proposed by the Company.

Staff Analysis

Staff appreciates the effort by MP 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.

The Department 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.

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2 MP described the calculation of Threshold for Major Event Day ("T_{med}") as a computing the natural log of each SAIDI value and taking the average (alpha) and standard deviation (beta) of the natural logarithms. The major event day threshold can then be found by using this equation: T_{med} = exp (alpha + 2.5*beta)

Staff believes that MP's April 1, 2014 filing complies with the applicable rules and Commission Order. 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. Staff believes significant progress has been made and the overall standard of reliability has improved for MP in 2013.

MP's proposed and the DOC recommended the Commission adopt the following for 2014 reliability standards:

	SAIDI	**SAIFI**	**CAIDI**
2014 Standard	97.5	1.02	95.59

MP's Past Standards and Performance

Staff has compiled both charts and graphs showing MP's past performance.

The table below depicts MP's past standards:

Year	**SAIDI**		**SAIFI**		**CAIDI**	
	Performance	Standard	Performance	Standard	Performance	Standard
2003	94.31	142.00	1.04	1.20	90.68	118.00
2004	119.58	137.54	**1.33**	1.09	90.02	125.72
2005	113.22	136.28	1.11	1.14	101.81	119.58
2006	118.30	143.33	1.13	1.19	105.05	120.45
2007	**125.18**	122.70	1.09	1.20	**115.32**	102.25
2008	85.95	114.12	0.98	1.14	87.81	100.10
2009	90.21	119.31	1.02	1.22	88.61	97.79
2010	96.51	106.57	**1.11**	1.06	86.70	100.54
2011	90.59	103.23	0.92	1.06	**98.47**	97.39
2012	89.75	97.69	0.93	1.02	**95.99**	95.40
2013	**120.43**	90.60	**1.14**	0.99	**105.64**	91.52
2014 Proposed		97.5		1.02		95.59

The numbers in bold indicate performance that did not meet the Commission Standard. MP met 24 out of 33 performance metrics from 2003 to 2013, which represents a 72.7% success rate.[3] For

[3] This compares to 37% for IPL, 55% for OTP, 58% for NWEC, and 57% for Xcel over similar

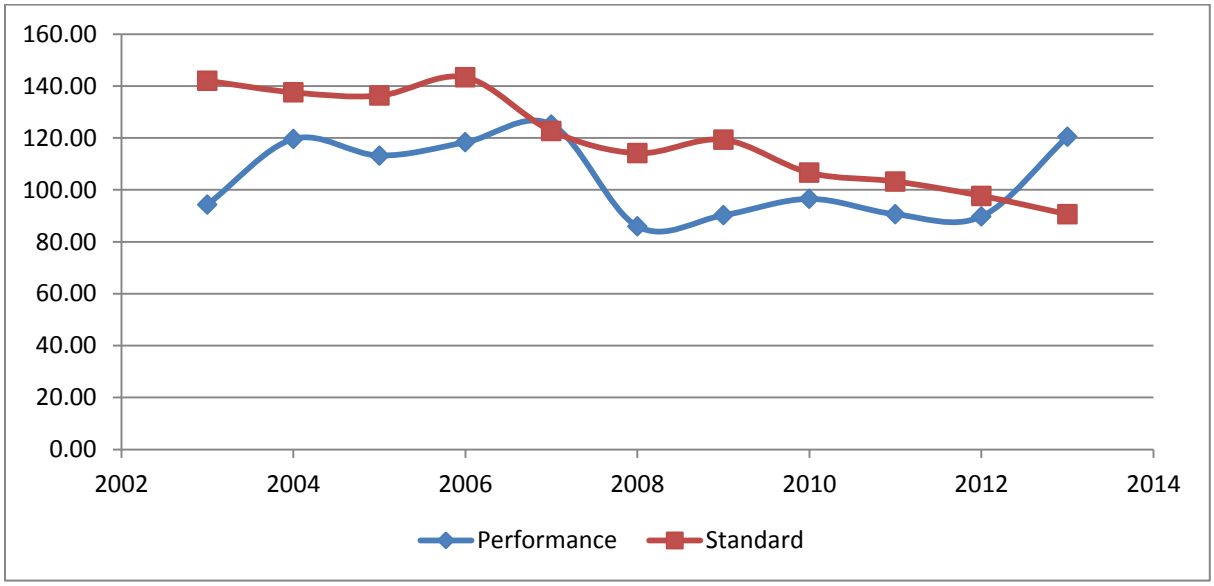
2013, MP missed the standard for CAIDI, SAIDI and SAIFI.

The Commission has set performance standards at the Company's proposed levels since 2004. MP calculated its performance targets as an average of the previous five years of actual SAIDI and SAIFI performance.

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 CAIFI, 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, and as long as performance standards are coming down or stabilizing each year, may continue to be appropriate for setting the performance standards. However, Staff does not know what constitutes the optimal standard.

MP has consistently met its targets over the ten year period. In addition, the last five years of observations have yielded a lower average SAIFI and a SAIFI that is more consistent with less variation than the SAIFI observations in the first five years of observations. However, MP exceeded the standard in 2013. The trends in SAIDI performance and standards can be seen below in the following diagram.

SAIDI Performance and Standard



Likewise SAIFI Performance and Standards has shown a similar trend. In most years, MP met the SAIFI performance standard set by the Commission. However, the improvement in SAIFI

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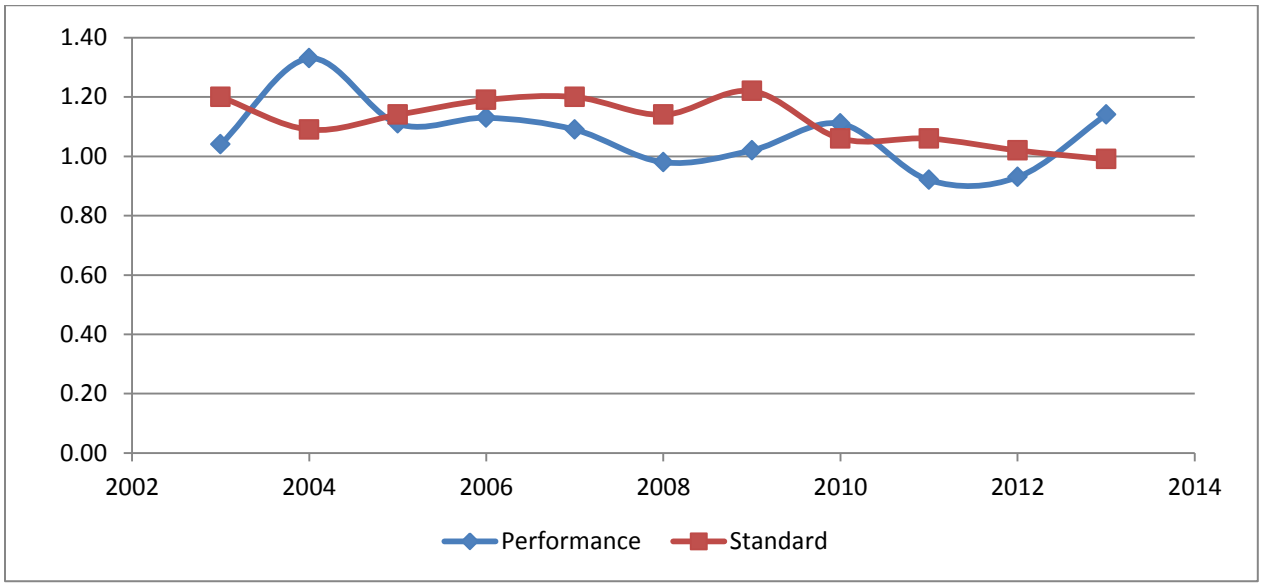
periods.

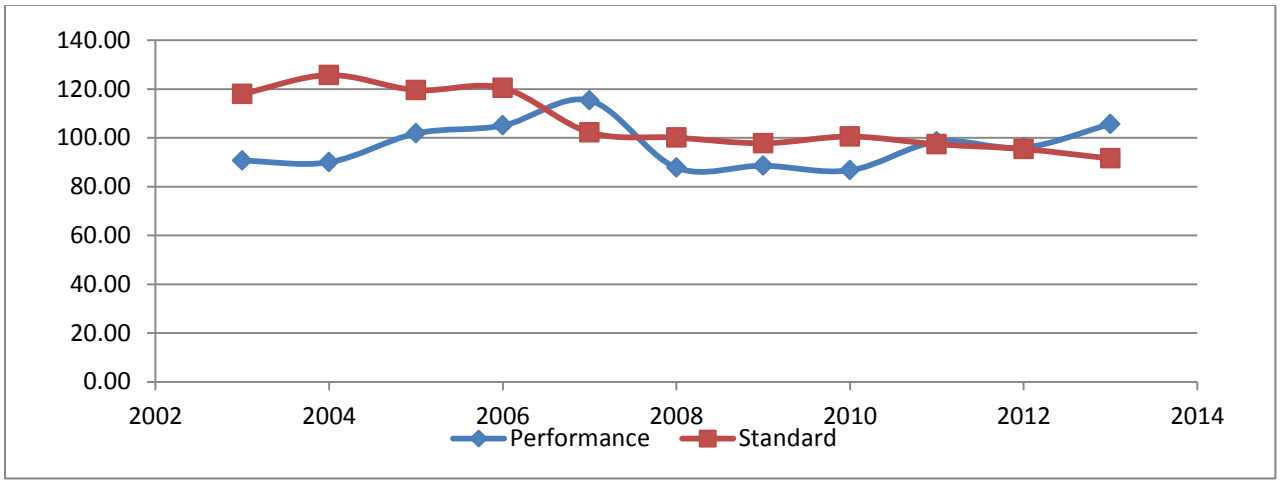
performance and standards has been significant over the ten-year period. The following diagram shows improvement in the number of customer interruption experienced by a typical customer over the ten-year period. However, MP exceeded the standard in 2013.

SAIFI Performance and Standards



Also, MP has met the performance standard for most years in the same period for CAIDI. The performance standard for CAIDI has gone down since 2003. During the first five years of observations, the average CAIDI (number of minutes per outage) performance was 100.58 and during the most recent five years it was 94.98. In addition, the most recent five years were more consistent with less variation than the previous five years. The following diagram shows improvement in the number of customer minutes of outages per outage over the ten-year period. However, MP exceeded the standard in 2013.

CAIDI Performance and Standards



Commission Options

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

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

B. Do not accept MP'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 MP's proposed reliability standards for 2014?

A. Accept MP's 2014 proposed reliability standards at the levels indicated below:

	SAIDI	**SAIFI**	**CAIDI**
2014 Standard	97.50	1.02	95.59

B. Accept some other reliability standard for 2014.

III. Additional Issues for Reports due April 1, 2015

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

A. Continue to require MP 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 MP 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.

Recommendation

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