Minnesota Public Utilities Commission

Staff Briefing Papers

Meeting Date: **December 12, 2013** .....*Agenda Item # 3

Companies: Interstate Power and Light Company

Docket No. E001/M-13-249

In the Matter of Interstate Power and Light Company (IPL) 2012 Annual Safety, Reliability, Service Quality Report, and Proposed Annual Reliability Standards for 2013.

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

Staff: Marc Fournier 651-201-2214

Relevant Documents

Commission Order Approving Reports,
Setting 2012 Reliability Standards, and
Setting Filing Requirements Docket No. E001/M-12-320 ..... December 20, 2012

Interstate Power and Light's (IPL) 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

Comments of the Minnesota Chamber of Commerce
Division of Energy Resources. .....August 22, 2013

Reply Comments of Interstate Power and Light..... September 20, 2013

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 IPL's Safety, Reliability, and Service Quality Reports for 2012?

Should the Commission accept IPL'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, IPL 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 IPL'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 Interuption 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 interuptions per customer per year. It is derived by dividing the total annual number of customer interuptions 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 December 20, 2012, in Docket No. E-001/M-12-320, the Commission ordered, in regard to the reliability report due April 1, 2013, that IPL 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 status update on the recloser and fuse coordination at affected substations to ensure proper fuse sizes have been installed to coordinate with substation protection equipment operation.

c. a report on the five-year construction plan based on the most recent reliability indices and circuit performance information. This report should evaluate where construction dollars will have the greatest impact on reliability and include the cost and benefit to customers.

d. a report on the Company's review of the Life Extension guidelines with field engineering and construction crews. The review should ensure wildlife protection is installed on all projects and lightning protection is installed as designed by the engineer.

e. 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.

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

IPL'S 2012 ELECTRIC SAFETY, RELIABILITY AND SERVICE QUALITY REPORT AND COMMISSION CONSIDERATION OF PROPOSED RELIABILITY STANDARDS FOR 2013

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

In its December 20, 2012 Order, the Commission set IPL's 2012 reliability standards. IPL's Reliability Report provided the following information in regard to IPL's 2012 reliability performance in comparison to the 2012 standard:

Work Station	SAIDI			SAIFI			CAIDI		
	Standard	Performance	Performance without Planned Outages	Standard	Performance	Performance without Planned Outages	Standard	Performance	Performance without Planned Outages
Winnebago	59.81	**99.31**	65.2	0.90	**0.95**	0.7	66.17	**105.03**	93.4
Albert Lea	80.30	75.41	65.6	1.02	**1.14**	1.00	78.44	65.98	67.3

The numbers in bold indicate performance that did not meet the Commission Standard. IPL stated it did not meet the standards for SAIDI, SAIFI, or CAIDI for the Winnebago Zone. It achieved the standards for SAIDI and CAIDI, but narrowly missed SAIFI for the Albert Lea Zone in 2012. Although IPL missed some goals as established in the Commission's Order, IPL strives to provide reliable power to its customers. The reliability indices were provided for 2012 reflecting all outage minutes as required by the Commission. IPL also included reliability indices calculated after removing planned outage minutes to illustrate how planned outages can adversely affect the indices. Outages caused by weather, animals, equipment failure, and trees are actually decreasing as a result of the pro-active work IPL is implementing during planned outages.

Storm Normalization Methodology

IPL stated it uses the IEEE 1366 standard for defining a major event, as follows:

1. Assign each outage to the date it started;
2. Calculate daily SAIDI for the five years prior to the current year;
3. Calculate natural log of each daily SAIDI, using the lowest daily SAIDI figure in place of zero, since zero is indeterminate;
4. Calculate mean and standard deviation of log data;
5. Set threshold equal to mean + 2.5 x standard deviation;
6. Convert log threshold back to SAIDI per day threshold; and
7. Exclude events from all days with SAIDI per day over threshold.

In 2012, there were no events in the Winnebago operating zones that qualified for exclusion therefore, all outage events occurring in 2012 were included in the reliability indices being reported.

In the Albert Lea operating zone, the March 29th and September 5th outage events qualified for exclusion under the Beta 2.5 method. On March 29th a squirrel caused the substation recloser and transformer to fail at the Plainview substation. On September 5th, a severe thunderstorm swept through the entire zone causing system wide damage.

Action Plan to Improve Reliability

<u>Albert Lea Zone</u>

IPL met its SAIDI and CAIDI goals but did not meet the SAIFI goal in the Albert Lea operating zone for 2012. IPL attributes the SAIFI result of 1.14 versus the goal of 1.02 to a sharp increase in small duration planned outages during life extension work over previous years. These types of outages are necessary to install wildlife protection, replace transformers and other equipment at the customers' premise. In most cases these outages are short duration and affect few numbers of customers so that they do not make a significant contribution to the other indices. Although somewhat subjective, more consistent reporting of these scheduled outages by IPL crews to the dispatch center also contributed slightly to the increase in the total number of these events over previous years.

Winnebago Zone

As reported in the 2011 report, IPL did not meet the goals for SAIDI or CAIDI in the Winnebago Zone primarily due to the seven largest outages being substation lockouts in the Fulda area. Of these, five were related to wildlife tripping out the Magnolia substation. As a result, IPL has changed out the transformer and installed wildlife protection in the Magnolia substation in an effort to reduce lockouts. In addition, wildlife protection was installed on 12 miles of line out of this substation to further minimize the outages originating outside of the substation. As a result of this work, in 2012 there were no outages on the Magnolia 24kV system due to animals. At Magnolia the largest outage in 2012 was a broken phase conductor near Wilmont. The conductors at this location are difficult to reach due to the terrain in this area, so IPL is reviewing a scope to convert the line to underground.

The next largest outage in the Winnebago Zone in 2012 occurred at the Heron Lake substation. The substation lockout was caused by a blown insulator on facilities owned by ITC Midwest LLC (ITC Midwest) on the transmission side of the substation. The duration of the IPL distribution outage reflects the time required for ITC Midwest to make repairs to its transmission equipment. There were also two large outages on the distributions side of the system that accounted for 86,682 outage minutes, or 96% of all outage minutes, for the Heron substation. The first outage occurred on April 20, 2012, and after patrolling the line, no specific cause of the outage could be found. The line was placed back into service without further issue. The second outage at the Heron substation That occurred on November 25, 2012, was the result of a broken jumper on a recloser for the only circuit out of this substation. This outage affected 348 customers. Since there is only one circuit out of this substation, all customers served from the substation experienced the outage until the jumper could be repaired.

Commission Consideration of IPL's Proposed 2013Reliability Standards

IPL agrees with the DOC's recommendations to set IPL's performance standards for 2013 SAIDI, SAIFI, and CAIDI at the same levels as those set for 2008 through 2012.

Work Center	**SAIDI**	**SAIFI**	**CAIDI**
Winnebago	59.81	0.90	66.17
Albert Lea	80.30	1.02	78.44

DOC

As noted above, the Department provided a thorough summary and analysis of IPL's Electric Safety, Reliability and Service Quality Performance Report and Petition. The Department notes that the goals remained unchanged from 2008 to 2012. IPL's reliability report shows that the Company met its SAIDI and CAIDI goals for Albert Lea in 2012, but did not meet its Winnebago goals or SAIFI for Albert Lea.

The Department recommends that the Commission accept IPL's filing in fulfillment of the requirements of Minnesota Rules, Chapter 7826 and the Commission's December 20, 2012 Order, pending the submission of additional information. Additionally, the Department recommends that the Commission set the Company's reliability standards for 2013 as were approved by the Commission for 2008 through 2012.

Minnesota Chamber of Commerce

MAIFI is a reliability indicator that measures as a percentage the total number of momentary interruptions (less than 5 minutes in duration) per customer. MAIFI is an essential measure for commercial and industrial customers, especially as electric energy continues to play an ever greater role in commerce.

While the Chamber recognizes that IPL continues to make progress regarding tracking MAIFI across its system, we believe the company must do more. The Chamber understands that manually collecting MAIFI information by substation is cumbersome; therefore, the Commission should require IPL to acquire an expanded distribution SCADA system with real time access to recloser operations. IPL's current method, a manual download approach applied on a case-by-case basis when a reliability issue arises, does not respond adequately to the needs of commercial and industrial customers.

The Chamber points to the success Otter Tail Power ("OTP"), a rural investor owned utility, with a large agribusiness base has had in tracking and reporting MAIFI to its employees as a key performance indicator. The company reports its progress on key performance reliability indicators including SAIFI, CAIDI, and MAIFI to employees on a monthly basis. The Chamber believes that IPL can learn from the success of OTP and cost-effectively implement a strategy to report MAIFI and begin to address reliability issues on its system.

IPL Reply

IPL agreed with the Department recommendations to set IPL's 2012 reliability performance standards for SAIDI, SAIFI, and CAIDI at the same level as those set for 2008, 2009, 2010 and 2011. IPL also acknowledged its responsibility to provide safe and reliable electricity to its customers in Minnesota.

In the DOC's comments, the DOC request that IPL reconcile the Company's representation

of its five-year construction plan with IPL's narrative explanation of what is included in the plan, including an explanation as to why the Benefit Cost Ratio is not provided for each project, why projects of less than $25,000 are included, and why there is not an estimated project cost listed for the "Albert Lea-Fairway spacer cable" project. It appears that IPL has fulfilled the request.

In response to the Chamber, IPL stated he Chamber stated in its Comments that it believes IPL must do more to further reporting of the MAIFI index across its system. The Chamber recognized that IPL continues to make progress regarding tracking MAIFI across its system, but asserts that IPL's current method, a manual download approach applied on a case-by-case basis when a reliability issue arises, does not respond adequately to the needs of commercial and industrial customers. Additionally, the Chamber points to the success Otter Tail Power (OTP) has had in tracking and reporting MAIFI as a key performance indicator and believes that IPL can learn from the success of OTP and cost effectively implement a strategy to report MAIFI and begin to address reliability issues on its system.

IPL welcomes and seeks input from all customers and stakeholders, regarding service quality, reliability, and cost. Delivering safe and reliable electric and natural gas services to our customers is a top priority. IPL investigates and applies best practice asset management strategies that involve a comprehensive set of operation and maintenance practices, as well as prioritized capital investments in infrastructure that include proven and cost effective technologies

Staff Analysis

Staff appreciates the effort by IPL 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.

The Department examined all the factors required by the rules. Staff will concentrate its comments on the reliability factors. Staff believes the Department 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 Department.

Staff believes that IPL's April 1, 2013 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 concurs with the findings by the Department and shares the Department's concern over the of IPL's reliability performance since 2003 and that current strategies may not be sufficient to improve IPL's overall performance.

DOC recommended and IPL agreed the Commission adopt the following for 2013 reliability

standards:

Work Center	**SAIDI**	**SAIFI**	**CAIDI**
Winnebago	59.81	0.90	66.17
Albert Lea	80.30	1.02	78.44

The tables below depicts IPL's past performance and standards since 2003 for Winnebago and Albert Lea work centers:

Winnebago Work Center

Year	**SAIDI**		**SAIFI**		**CAIDI**	
	Performance	Standard	Performance	Standard	Performance	Standard
2003	53.46	73.72	**1.28**	0.91	41.69	81.13
2004	44.66	57.13	0.59	1.01	**75.39**	56.57
2005	**95.30**	54.34	**1.12**	0.89	**84.80**	61.33
2006	29.20	65.27	0.51	0.91	57.70	72.04
2007	**76.45**	56.55	**1.02**	0.85	**75.10**	66.19
2008	49.30	59.81	0.47	0.90	**103.99**	66.17
2009	32.63	59.81	0.39	0.90	**84.59**	66.17
2010	**110.40**	59.81	**1.20**	0.90	**88.74**	66.17
2011	**90.07**	59.81	0.72	0.90	**124.40**	66.17
2012	**99.31**	59.81	**0.95**	0.90	**105.03**	66.17
2013 Proposed		59.81		0.90		66.17

Albert Lea Work Center

Year	**SAIDI**		**SAIFI**		**CAIDI**	
	Performance	Standard	Performance	Standard	Performance	Standard
2003	72.91	134.90	1.20	1.74	60.45	77.74
2004	**60.80**	47.58	**0.83**	0.76	**73.10**	62.28
2005	**101.00**	52.28	**1.06**	0.80	**95.70**	65.68
2006	**89.80**	67.75	**0.90**	0.93	**99.70**	73.17
2007	77.08	77.39	**1.13**	0.97	68.25	80.18
2008	**115.00**	80.30	**1.29**	1.02	**89.30**	78.44

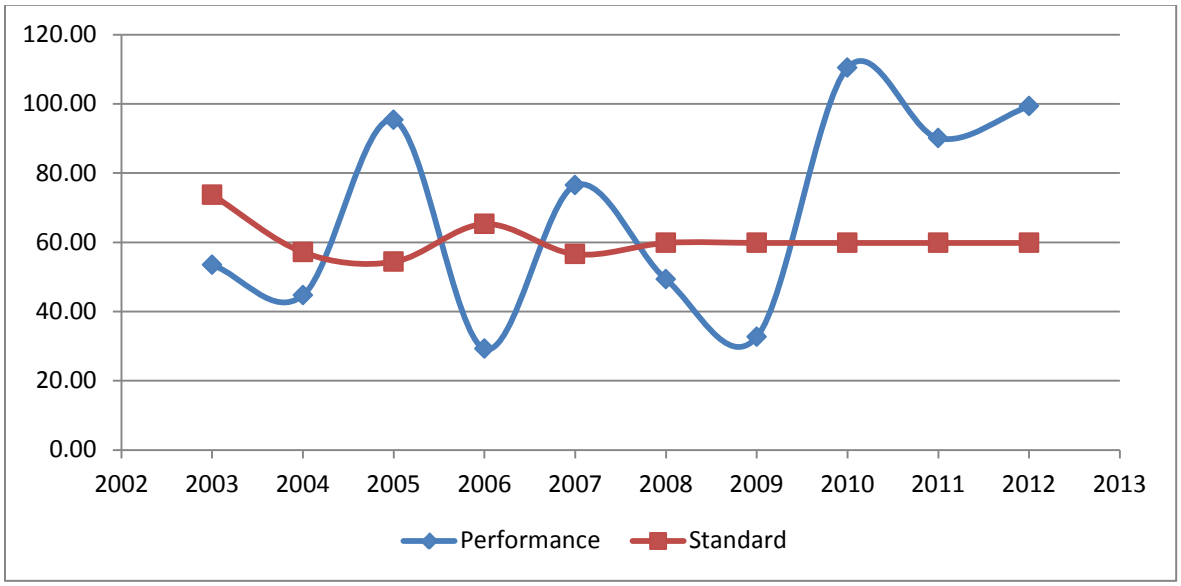
2009	68.31	80.30	**1.09**	1.02	62.52	78.44
2010	**125.70**	80.30	**1.60**	1.02	**78.90**	78.44
2011	**81.83**	80.30	1.01	1.02	**80.81**	78.44
2012	75.41	80.30	**1.14**	1.02	65.98	78.44
2013 Proposed		80.30		1.02		78.44

The numbers in bold indicate performance that did not meet the Commission Standard. As noted by the Department in its Comments, IPL met only 23 out of 60 performance metrics from 2003 to 2012, which represents a 38% success rate.[1] For 2012, IPL did meet any of the standards for SAIDI, SAIFI, or CAIDI in the Winnebago work center. IPL met the standard for SAIDI and CAIDI in the Albert Lea work center. However, it did not meet SAIFI in the Albert Lea works center.

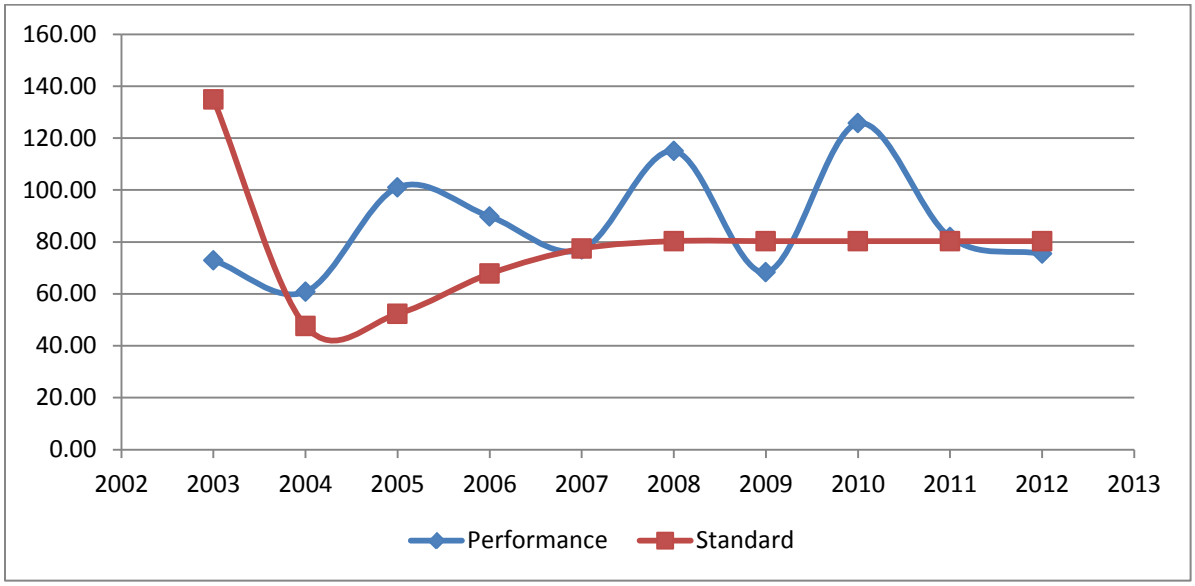
IPL has not consistently met its targets over the 10 year period. In both work stations IPL has not shown any significant improvement in SAIDI performance. In fact, the trends in SAIDI performance and standards, observed in the following diagrams, appear to reflect declining reliability performance at least in the Winnebago work center. The following two diagrams appear to demonstrate an increasing rate of customer minutes of interruptions per customer over the nine year period.

[1] This compares to 80% for MP, 60% for OTP, 60% for NWEC, and 58% for Xcel over similar periods.

Winnebago SAIDI Performance and Standard



Albert Lea SAIDI Performance and Standard



SAIFI Performances and Standards have shown similar trends in both work stations. The diagrams below show no significant improvement in the number of customer outages experienced by the typical customer between 2003 and 2012.

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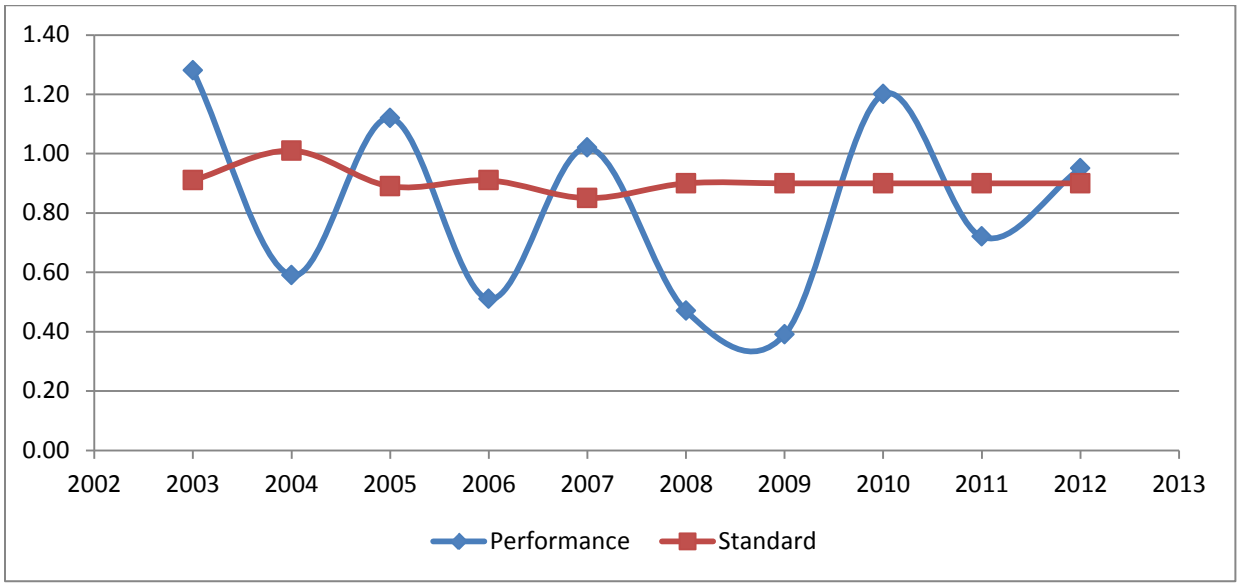
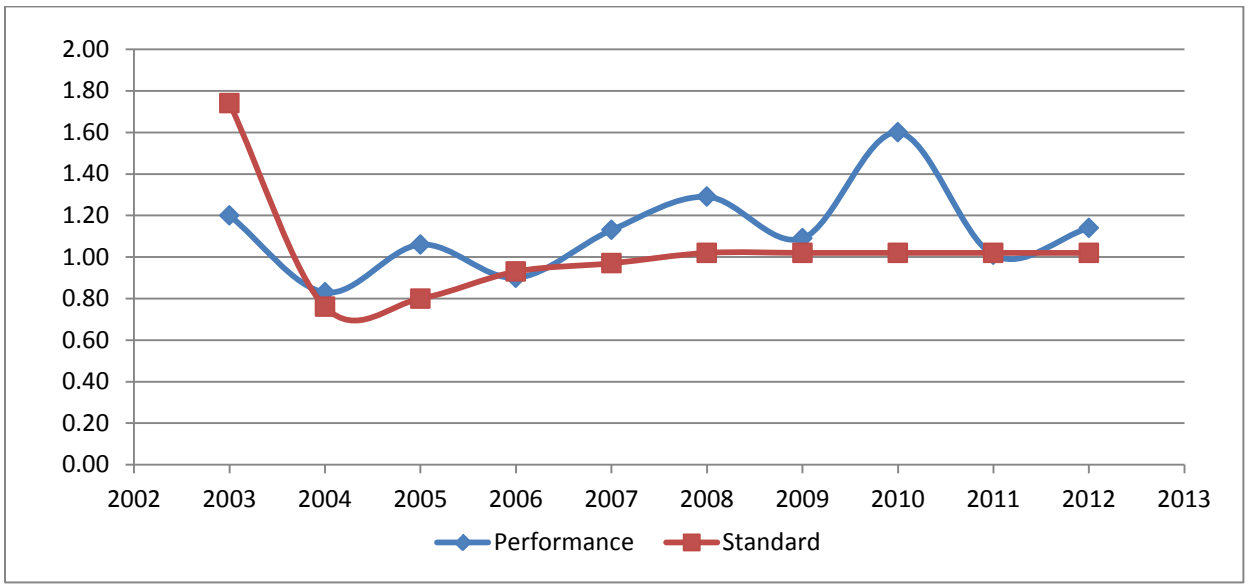
Winnebago SAIFI Performance and Standards



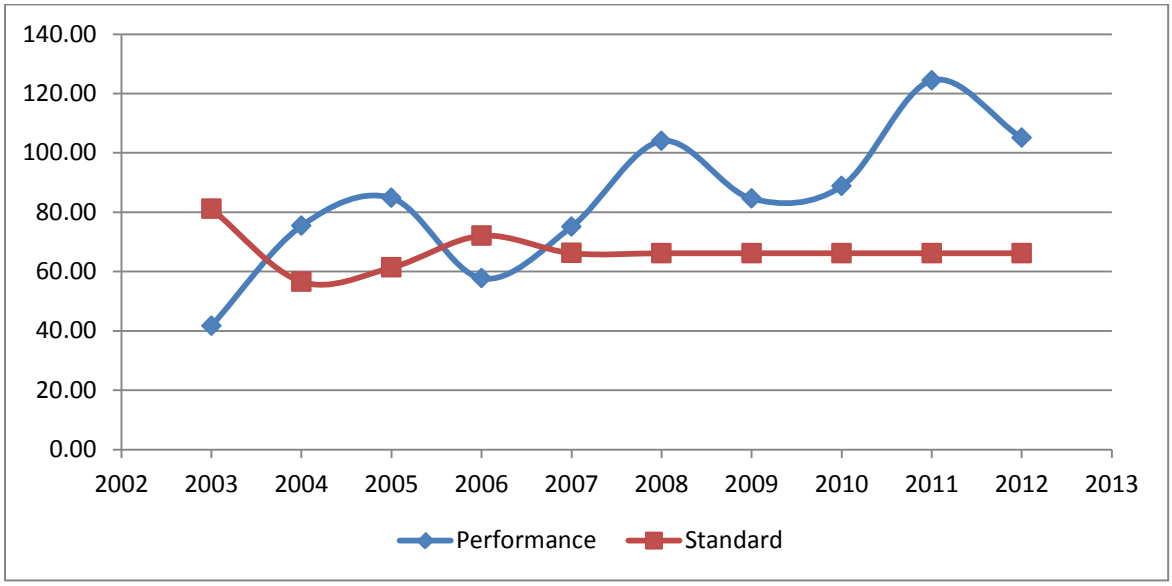
Albert Lea SAIFI Performance and Standards



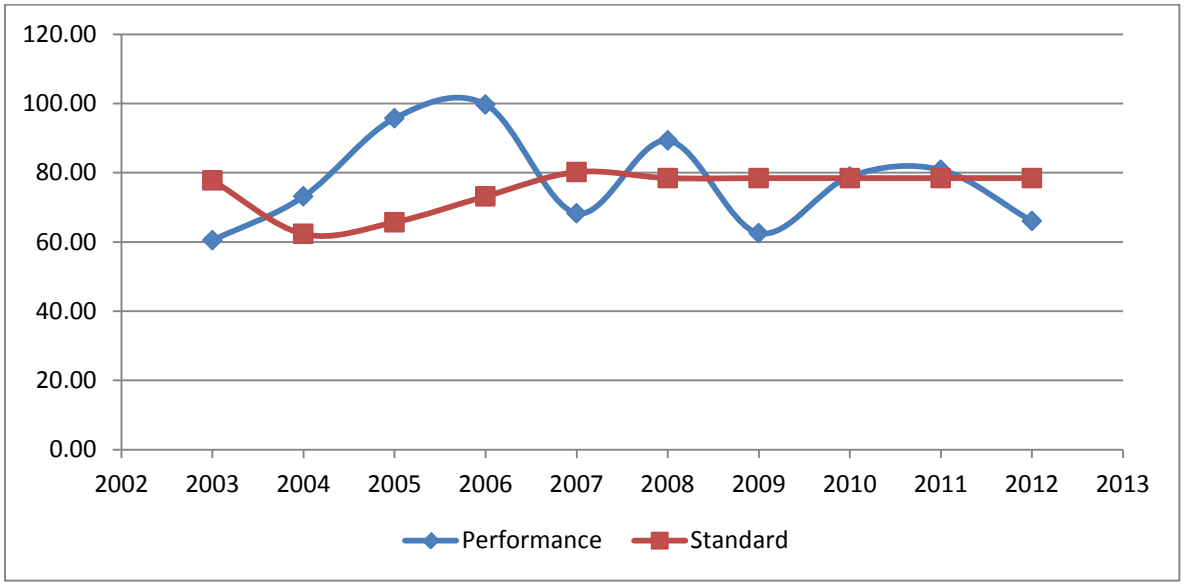
Likewise, for CAIDI performance over the same time period, IPL has demonstrated no significant improvements in customer minutes of interruption per customer interruption. The following diagrams appear to indicate increasing trends in customer minutes of interruption

per customer interruption over the ten year period in the Winnebago work center.

Winnebago CAIDI Performance and Standards



Albert Lea CAIDI Performance and Standards



Since 2009, IPL has proposed standards based on a methodology that calculates the mean and median of the previous five years of data and also the mean of the previous five years with the highest and lowest figures excluded and then choosing the most favorable customer service

standard among the three calculations for each reliability metric. IPL used the same methodology in proposing reliability standards in 2013.

The Commission did not approve IPL's method in 2009, 2010, 2011, and 2012 and instead set reliability standards at the same level as its 2008, as recommended by the Department. As the Department noted in the past, setting standards at levels greater than the previous years does not encourage efforts to improve reliability. The Department concluded that setting standards for IPL based on past performance "acquiesces to the Company's declining performance trend."

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. Using a five year rolling average provided useful baseline information for initial reports, and as long as performance standards are coming down each year, may continue to be appropriate for setting the performance standards. However, Staff agrees with the Department recommendation to set IPL's 2013 reliability performance standards for SAIDI, SAIFI, and CAIDI at the same level as those set for 2008, 2009, 2010, 2011 and 2012. As noted above, IPL also agreed with the Department's recommendation in its reply comments.

Commission Options

I. Whether the Commission should accept IPL's Reports on 2012 Results?

A. Approve IPL's April 1, 2013 safety, reliability and service quality reports, as complying with Minn. Rules, Chapter 7826 and relevant Commission orders.

B. Do not approve IPL's March 30, 2012 safety, reliability and service quality reports, as complying with Minn. Rules, Chapter 7826 and relevant Commission orders.

II. Whether the Commission should Accept IPL's proposed reliability standards for 2013?

A. Approve IPL's 2012 proposed reliability standards at the levels indicated below:

Work Center	**SAIDI**	**SAIFI**	**CAIDI**
Winnebago	59.81	0.90	66.17
Albert Lea	80.30	1.02	78.44

B. Approve 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 IPL 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. Include a report on IPL's review of the Life Extension guidelines with Field Engineering and construction crews. The review should ensure wildlife protection is installed on all projects and lightning protection is installed as designed by the engineer;

C. The reports required under Minnesota Rules, part 7826.0500, subp. 1G;

D. The SAIDI, SAIFI, and CAIDI performances for its worst performing circuits, as required in Minnesota Rules, part 7826.0500, subp. 1H; and

E. Continue to require IPL 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, B, C, D, and E.