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February 10, 2017

Docketing Division
Public Utilities Commission of Ohio
180 East Broad Street
Columbus, OH 43215

RE: *In the Matter of the Establishment of 4901:1-10-10(B) Minimum Reliability Performance Standards for Ohio Power Company.*

Dear Docketing Division:

Enclosed please find Staff's Review and Recommendations in regard to the application filed by Ohio Power Company in Case No. 16-1511-EL-ESS.

Barbara Bossart
Chief, Reliability and Service Analysis Division
Public Utilities Commission of Ohio

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Technician Date Processed FEB 10 2017

**AEP Ohio Standards Application
16-1511-EL-ESS
Staff Position**

I. Introduction

On June 29, 2012 in Case No. 12-1945-EL-ESS, Ohio Power Company (currently dba AEP Ohio or "AEP") filed an application for revised performance standards for the newly combined Columbus Southern Power Company and Ohio Power Company. A stipulation signed by the Company, Staff, and Ohio Consumers' Council was filed March 3rd, 2014, and approved in its entirety by Commission Order on March 19th, 2014.

The approved stipulation set the standards to 1.20 for SAIFI and 150.0 for CAIDI, which were applied to performance beginning with the 2013 calendar year. Those standards were based upon a 4-year average (2009-2012) of actual performance and did not make adjustments for the Enhanced Service Reliability Rider (ESRR), gridSMART, or the Distribution Investment Rider (DIR) programs.

Per the stipulation in that case, AEP agreed to file an updated standards application no later than June 30th, 2016. The Company filed an application to establish minimum reliability performance standards in accordance with O.A.C. 4901:1-10-10(B) on June 30th, 2016 in Case No. 16-1511-EL-ESS. In the application, AEP proposes the following calculation of revised standards:

TABLE 1

	SAIFI	CAIDI
Three Year Average	1.10	142.20
DIR Adjustment	(0.01)	(0.036)
Annual Variation Adjustment	12%	12%
Proposed Standard	1.22	159.23

II. Executive Summary

Staff believes that based on historical performance and customer expectations, AEP's proposed calculation of averaging the last three years of reliability performance and adding a 12% adjustment is inappropriate. Additionally, Staff recommends that the calculation include an adjustment to account for the positive impact of the Enhanced Service Reliability Rider.

Staff proposes the following calculation for revised standards:

TABLE 2

	CAIDI	SAIFI	
Current Standards	150.00	1.20	Established in Case No. 12-1945-EL-ESS
ESRR Adjustment	(9.96)	(0.07)	Proposed by Staff
DIR Adjustment	(0.036)	(0.01)	Proposed by Company
Revised Standards	140.00	1.12	

Staff recommends that the Commission require AEP to file an updated standards application in no fewer than three and no more than six years following issuance of a Commission order in this case to reflect the impact of gridSMART as well as any other system changes or technological advancements.

III. Historical Performance & Customer Expectations

AEP has met the performance standards approved during the 12-1935-EL-ESS case every year since the standards were enacted.

TABLE 3

	SAIFI		CAIDI	
	Standard	Performance	Standard	Performance
2015	1.20	1.13	150.00	139.03
2014	1.20	1.13	150.00	146.61
2013	1.20	1.03	150.00	140.97

Per O.A.C. 4901:1-10-10(B)(4)(b), each electric utility is required to periodically (no less than three years) conduct a customer perception survey. Results of the most recent customer perception survey, which was conducted in 2015, show that 87% of residential and 94% of commercial customers state that they feel their expectations regarding reliable service will either increase or remain the same over the next five years. Approximately 20% of each customer class state that they feel their expectations will increase.

That said, Staff believes that the most appropriate approach to calculating revised standards is to examine the impact of major initiatives which the Company has undertaken since the previous standards case.

IV. Enhanced Service Reliability Rider

Beginning with ESP I in Case No. 08-917-EL-SSO, AEP established an Enhanced Service Reliability Rider (ESRR) for the purpose of transitioning from a reactive, performance-based approach to vegetation management to a cycle-based trimming program. Under the revised program, each circuit is to be trimmed end-to-end every four years, right-of-ways widened, and danger trees removed. The program was continued through ESP II and III, and another continuation including a modification which would increase expenditures each year by 2.5% is requested as part of Amended ESP III in Case No. 16-1852-EL-SSO¹.

When originally proposed, the Company stated that the purpose of the ESRR was to “improve the customer’s overall service experience by reducing and/or eliminating momentary interruptions and/or sustained outages caused by vegetation.”² Since its inception, the percentages of outages, customer interruptions, and customer minutes interrupted caused by trees inside the right-of-way when compared to all outage causes have decreased significantly.

¹ Dias Testimony, Case No. 16-1852-EL-SSO, November 23, 2016, pg. 14

² Boyd Testimony, Case No. 08-917-EL-SSO, July 31, 2008, pg. 26

CHART 1

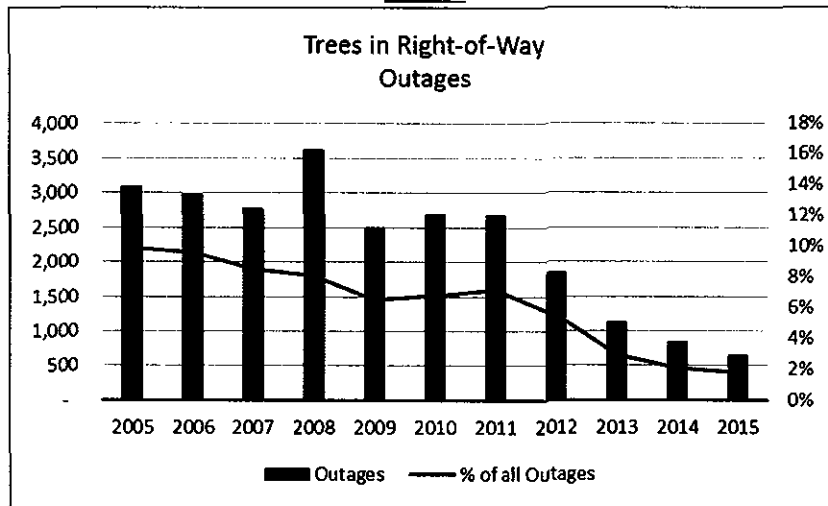


CHART 2

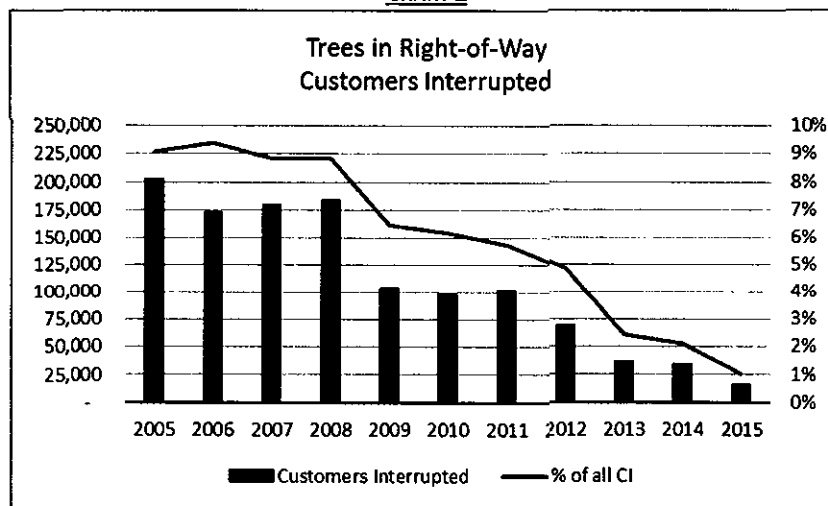
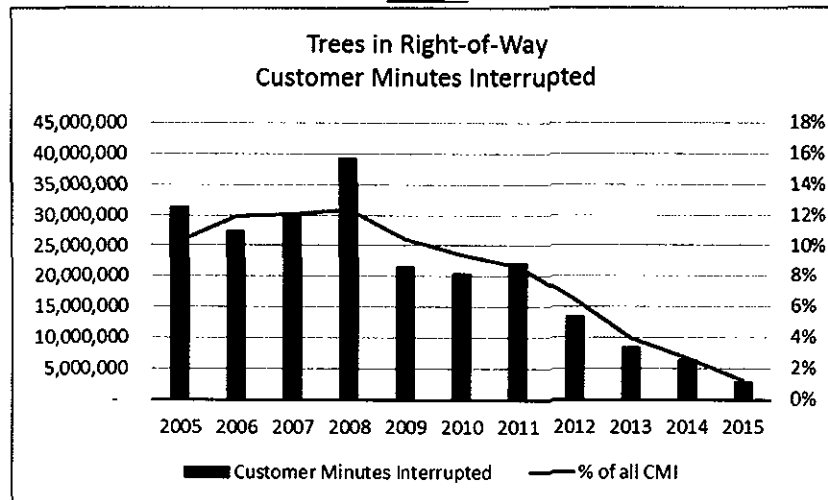


CHART 3



As part of the stipulation the prior standards case, the signatory parties agreed that there was not a need to make an adjustment for the ESRR³. However, Staff believes that at this time, reliability improvements attributable to the ESRR can be quantified and should be factored into the revised standards.

To quantify the improvement factor, Staff began by comparing data for outages caused by trees inside the right-of-way and calculated averages for the five years leading up to the approval of the ESRR (2005 – 2009), and the five years following, leading up to the point at which the “catch up” period was complete and all circuits were on a trimming cycle (2010 – 2014).

TABLE 4

Customers	Interruptions	CMI	Outages
Averages: 2005 – 2009			
1,440,171	168,604	26,996,388	2,990
Averages: 2010 - 2014			
1,450,063	68,009	14,187,214	1,831
Avoided service disruptions			
1,450,063	100,596	15,779,174	1,158

Staff then calculated the difference between the two sets of averages to determine the approximate customer interruptions, customer minutes interrupted, and outages which potentially would have occurred absent the implementation of the ESRR.

In order to calculate the impact upon SAIFI, Staff divided the avoided customer interruptions by the average customer count from 2010 – 2014:

$$\text{SAIFI} = 100,596 / 1,450,063 = 0.7$$

To calculate the impact upon CAIDI, Staff used outage data across all causes to calculate a CAIDI baseline, then used the avoided CMI calculated in Table 4 to determine what impact the ESRR had upon overall system reliability.

TABLE 5

2010 – 2014 Averages	
Customers Interrupted	1,583,763
Customer Minutes Interrupted	226,596,907
CAIDI baseline (calculated from values above)	143.07
CAIDI Improvement Factor	
Average Customers Interrupted 2010 - 2014	1,583,763
Average Customer Minutes Interrupted 2010 - 2014	226,596,907
Customer Minutes Interrupted Improvement	15,779,174
Customer Minutes Interrupted w/ Improvement	210,814,733
CAIDI w/ Improvement	133.11
CAIDI improvement over baseline	9.96

Staff recommends that the revised standards are reduced by 0.7 for SAIFI and 9.96 for CAIDI to account for the impact of the Enhanced Service Reliability Rider.

³ Joint Stipulation and Recommendation, Case No. 12-1945-EL-ESS, March 3, 2014, pg. 3

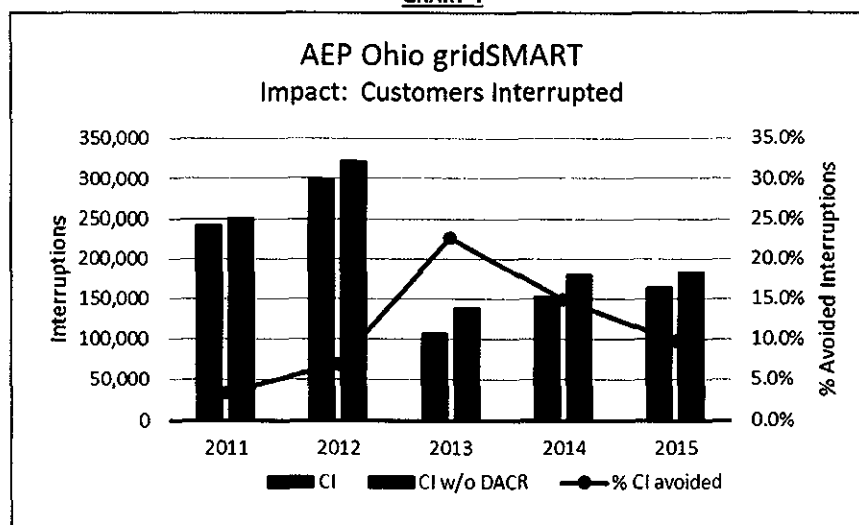
V. gridSMART® Rider

As part of AEP's first ESP in Case No. 08-918-EL-SSO, the Company was authorized to initiate Phase 1 of gridSMART to approximately 110,000 meters and seventy distribution circuits⁴. On July 28th, 2016 in Data Request #1 in this case, Staff asked the Company to provide following information for all outages occurring in the gridSMART Phase 1 area for calendar years 2011 – 2015:

- Circuit name
- Total number of customers on the circuit
- Interruption date
- Number of customers interrupted
- Total customer minutes interrupted
- Calculated number of customers interrupted absent gridSMART technology
- Calculated customer minutes interrupted absent gridSMART technology

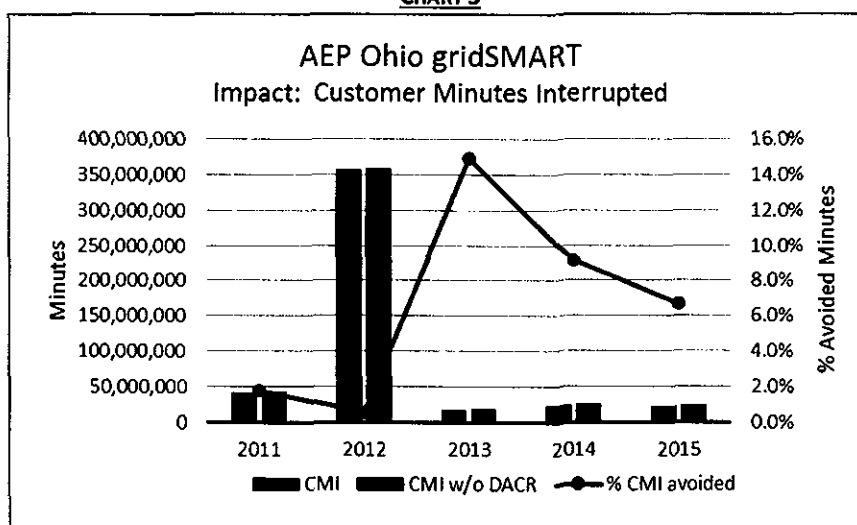
Staff evaluated this data and found that while there has been marked reliability improvement attributable to gridSMART technology, overall impact has been trending downwards for the last three years both in terms of avoided customer interruptions and avoided customer minutes interrupted. This is further illustrated on the following charts:

CHART 4



⁴ Opinion and Order, Case Nos. 08-917-EL-SSO and 08-918-EL-SSO, March 18, 2009, pg. 38

CHART 5



As part of AEP's second ESP in Case No. 11-346-EL-SSO, the Company was directed to continue gridSMART Phase 1 and to initiate gridSMART Phase 2⁵. In the Phase 2 application filed in Case No. 13-1939-EL-RDR (gridSMART application), the Company proposed expanding gridSMART to approximately 894,000 meters, installing Distribution Automation Circuit Reconfiguration (DACR) on approximately 250 circuits, and Volt/VAR Optimization on approximately 80 circuits⁶.

A stipulation and recommendation was filed in the case on March 7th, 2016, and a hearing commenced on July 19th, 2016. The stipulation was approved per Commission Order on February 1st, 2017.

In the gridSMART application, the Company stated that in 2012, customers on circuits with DACR experienced a SAIFI improvement of 14.1% and SAIDI improvement of 9.4% compared with how the circuits would've performed without DACR⁷. Per the stipulation signed by the Company, Staff, and other signatory parties, the company committed to achieve a 3-year average annual SAIFI improvement of 15.8%, excluding major events, on Phase 2 circuits equipped with DACR⁸.

The Company currently has about 1.5 million meters installed within its service territory; 8.6% have been converted to AMI technology. Phase 2 will bring that percentage up to 67%. Of the 1,600 distribution circuits in AEP Ohio territory, 70 have been equipped with DACR. Phase 2 will bring that total to 330 circuits, or approximately 21% of the total service territory.

On September 13th, 2016 in request to Staff Data Request #2 in this case, the Company advised that the revised standards as proposed do not take into account the impact of gridSMART Phase 2 implementation.

⁵ Opinion and Order, Case Nos. 11-346-EL-SSO, et al., August 8, 2012, pg. 62

⁶ Application, Case No. 13-1939-EL-RDR, September 13, 2013, Attachment A, pgs. 2-3

⁷ Ibid, 4

⁸ Stipulation, Case No. 13-1939-EL-RDR, April 7, 2016, pg. 6

Staff recommends no adjustment to account for reliability improvements attributable to gridSMART at this time. However, AEP's next standards application should include such a calculation with supporting data to be examined by Staff.

VI. Distribution Investment Replacement Rider

The Distribution Investment Replacement rider (DIR) was established as part of Case No. 11-346-EL-SSO and intended to recover distribution expenses and return on investments associated with FERC Plant Accounts 360-374:

- 36000 – Land
- 36010 – Land Rights
- 36100 – Structures and Improvements
- 36200 – Station Equipment
- 36300 – Storage Battery Equipment
- 36400 – Poles, Towers, and Fixtures
- 36500 – Overhead Conductors and Devices
- 36600 – Underground Conduit
- 36700 – Underground Conductors and Devices
- 36800 – Line Transformers
- 36900 – Services
- 37000 – Meters
- 37016 – AMI Meters
- 37100 – Installations on Customer Premises
- 37200 – Leased Property Customer Premises
- 37300 – Street Lighting & Signal Systems

Only those expenses not recovered through base rates or other riders may be recovered through the DIR rider.

To calculate an adjustment attributable to the DIR, the Company began by examining the percentage of capital expenditures associated with reliability (accounts 361-367) compared to total gross distribution plant for the last three years.

TABLE 6

	2013	2014	2015
Gross Distribution Plant	\$3,872,948,452	\$4,083,984,333	\$4,284,075,232
Reliability Capital Spend Per Year	\$132,133,175	\$186,890,866	\$202,884,299
Percentage of Capital Spend	3.41%	4.58%	4.74%

The Company then averaged the percentages for 2014 and 2015, applied the assumption⁹ that each capital reliability dollar spent would reduce an outage in the next ten years, to arrive at an adjustment of 0.466%.

⁹ The Company states in its application that this assumption is for the use of developing the standards only and acknowledges that this is a flawed assumption in reality.

To apply the adjustment to the calculated proposed SAIFI standard, the Company determined which outage causes are impacted by the DIR, calculated the average customer interruptions in each of those causes for the last three years, and applied the improvement factor of 0.466% to calculate future SAIFI improvement attributable to the DIR.

TABLE 7

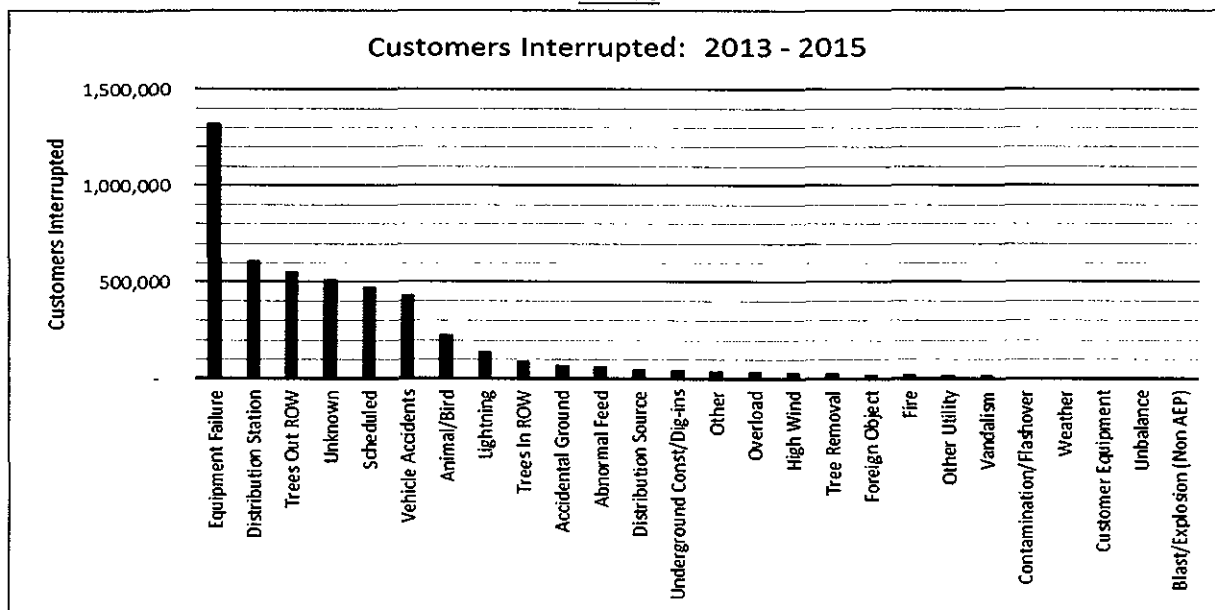
	2013	2014	2015
Customer Interruptions in impacted outage causes	704,669	853,980	824,528
Customer Interruptions * 0.466%	3,281	3,976	3,839

Average customer interruption improvement = 3,699

According to the Company, the outage causes impacted by the DIR are:

- Animal/Bird
- Contamination/Flashover
- Distribution Source
- Distribution Station
- Equipment Failure
- Lightning
- Overload

Staff examined outage causes for the last three years and believes that the Company's assessment of which causes within the Company's control (indicated by the red bars below) are most impacted by the DIR is accurate. Additionally, those outage causes impacted by the DIR account for approximately 50% of customer interruptions.

CHART 6

The Company then averaged the customer interruptions across all outage causes for the last three years, estimated customer counts, and subtracted the average interruption improvement to calculate the SAIFI improvement.

TABLE 8

2013 – 2015 Averages	
Customers Served	1,455,011
Customers Interrupted	1,597,795
SAIFI baseline (calculated from values above)	1.098
Year 1	
Customers Served	1,455,466
Average Customers Interrupted 2013-2015	1,597,795
Customer Interruption Improvement Factor	3,699
Year 1 Customers Interrupted	1,594,097
SAIFI	1.095
SAIFI improvement over baseline	0.003
Year 2	
Customers Served	1,455,490
Year 1 Customers Interrupted	1,594,097
Customer Interruption Improvement Factor	3,699
Year 2 Customers Interrupted	1,590,398
SAIFI	1.093
SAIFI improvement over baseline	0.005

The Company proposes to round up the estimated SAIFI improvements of 0.003 in Year 1 and 0.005 in Year 2 to a standard adjustment of 0.01.

The Company states that while the above methodology and logic apply to SAIDI, the same can not be said for CAIDI, and that “the DIR work has a minimal impact on lowering the amount of time...” for restoration of service. The Company proposes using an average of reduction in outage minutes attributed to the DIR sectionalization program as a means of calculating the impact of the DIR upon CAIDI. Those values for the last three years are as follows:

TABLE 9

Year	Reduction in outage minutes
2013	20,400
2014	31,200
2015	34,200

Average = 28,600 outage minutes

The Company then averaged the customer interruptions and customer minutes interrupted across all outage causes for the last three years and subtracted the average reduction in outage minutes to calculate the CAIDI improvement.

TABLE 10

2013 – 2015 Averages	
Customers Interrupted	1,597,795
Customer Minutes Interrupted	227,266,659
CAIDI baseline (calculated from values above)	142.24
Year 1	
Average Customers Interrupted 2013-2015	1,597,795
Average Customer Minutes Interrupted 2013-2015	227,266,659
Customer Minutes Interrupted Improvement	28,600
Year 1 Customer Minutes Interrupted	227,238,059
Year 1 CAIDI	142.22
CAIDI improvement over baseline	0.018
Year 2	
Average Customers Interrupted 2013-2015	1,597,795
Year 1 Customer Minutes Interrupted	227,238,059
Customer Minutes Interrupted Improvement	28,600
Year 2 Customer Minutes Interrupted	227,209,459
Year 2 CAIDI	142.20
CAIDI improvement over baseline	0.036

The Company proposes using the greater of the estimated CAIDI improvements for a standard adjustment of 0.036.

VII. Conclusion and Recommendations

In AEP's previous standards case, the Company agreed to file an updated application no later than June 30, 2016, that would reflect "the impact of system design changes, technological advancements, and geographical effects of programs like, but not limited to the Distribution Infrastructure Rider Program and gridSMART, and the results of its updated and current customer perception survey." While the Company has filed an updated application which addresses each of those items, Staff does not believe that the Company appropriately accounts for the impact of the Enhanced Service Reliability Rider.

Staff believes that the proposed baseline calculation of averaging the last three years of reliability performance and adding 12% is inappropriate and unnecessary. AEP's historical data provides no indication that reliability performance is trending in a negative direction and the Company has provided no justification for such a calculation. Additionally, the customer perception survey conducted in 2015 indicated that 87% of customers expect reliability to either remain the same or improve over the next five years.

Staff recommends the following calculation for revised CAIDI and SAIFI standards:

TABLE 11

	CAIDI	SAIFI	
Current Standards	150.00	1.20	Established in Case No. 12-1945-EL-ESS
DIR Adjustment	(0.036)	(0.01)	Proposed by Company
ESRR Adjustment	(9.96)	(0.07)	Proposed by Staff
Revised Standards	140.00	1.12	

Staff recommends that the Commission require AEP to file an updated standards application in no fewer than three and no more than six years following issuance of a Commission order in this case to reflect the impact of gridSMART as well as any other system changes or technological advancements.