BEFORE
THE PUBLIC UTILITIES COMMISSION OF OHIO

In the Matter of the Application of Ohio Power Company to Initiate Phase II of Its gridSMART Project and to Establish the gridSMART Phase II Rider	)))))	Case No. 13-1939-EL-RDR

REBUTTAL TESTIMONY
OF
SCOTT S. OSTERHOLT
ON BEHALF OF
OHIO POWER COMPANY

Filed August 8, 2016

BEFORE
THE PUBLIC UTILITIES COMMISSION OF OHIO
REBUTTAL TESTIMONY OF
SCOTT S. OSTERHOLT
ON BEHALF OF
OHIO POWER COMPANY

BACKGROUND

Q. WHAT IS YOUR NAME AND BUSINESS ADDRESS?

A. My name is Scott S. Osterholt, and my business address is 850 Tech Center Drive, Gahanna, Ohio 43230.

Q. ARE YOU THE SAME SCOTT S. OSTERHOLT WHO PREVIOUSLY FILED TESTIMONY IN THIS PROCEEDING?

A. Yes. I provided direct testimony on behalf of Ohio Power Company ("AEP Ohio" or the "Company") supporting the Stipulation filed in this proceeding. My direct testimony was filed on April 20, 2016 and admitted into evidence as AEP Ohio Exhibit 1.

Q. WHAT IS THE PURPOSE OF YOUR REBUTTAL TESTIMONY IN THIS PROCEEDING?

A. The purpose of my rebuttal testimony is to respond to the testimony of Ohio Consumers' Counsel ("OCC") witness Peter J. Lanzalotta. Specifically, I respond to claims made by Mr. Lanzalotta at pages 30-33 of his direct testimony, and at the hearing, concerning the performance of circuits with Distribution Automation Circuit Reconfiguration (DACR) installed as part of AEP Ohio's gridSMART Phase 1 ("Phase 1") deployment.

PHASE 1 DACR CIRCUIT SAIFI PERFORMANCE

Q. ON PAGE 31, TABLE 6, AND PAGE 32, LINES 6-14, OF MR. LANZALOTTA'S TESTIMONY, HE QUESTIONS THE VALUE OF DACR TECHNOLOGY BECAUSE SAIFI PERFORMANCE DECLINED IN 2014 AND 2015 FOR THE

CIRCUITS ON WHICH DACR TECHNOLOGY WAS INSTALLED AS PART OF GRIDSMART PHASE 1. DOES THIS DECLINE IN SAIFI PERFORMANCE IN 2014 AND 2015 MEAN THAT THE PHASE 1 DACR TECHNOLOGY FAILED TO PROVIDE RELIABILITY BENEFITS FOR CUSTOMERS DURING THOSE YEARS?

A. Absolutely not. The DACR technology installed on Phase 1 DACR circuits provided substantial reliability improvements even though overall SAIFI performance declined on those circuits in 2014 and 2015.

Table 1 below shows the reliability impact of the DACR technology on Phase 1 DACR circuits from 2009 to 2015. (A larger version of this table, with larger type, is also attached to my Rebuttal Testimony as Attachment SSO-R1.)

Table 1 – Impact of DACR Technology on Reliability of Aggregate gridSMART Phase 1 DACR Circuits (2009-2015)

AEP-OH Phase 1 DACR Impacts (70 Circuits)
All outage causes

			With DACR					DACR Savings		Without DACR					DACR Impact		
Year	Exclusions	Customers Served	Customers Interrupted	Customer Minutes	SAIDI	CAIDI	SAIFI	Avoided CI	Avoided CMI	Customers Interrupted	Customer Minutes	SAIDI	CAIDI	SAIFI	SAIDI	CAIDI	SAIFI
2009	Excl OMEDs	108,658	146,665	14,642,859	134.8	99.8	1.35										
2010	Excl OMEDs	110,843	159,770	17,245,941	155.6	107.9	1.44										
2011	Excl OMEDs	110,301	198,858	21,134,859	191.6	106.3	1.80	7,427	616,441	206,285	21,751,300	197.2	105.4	1.87	-2.8%	0.8%	-3.6%
2012	Excl OMEDs	111,489	136,741	17,989,775	161.4	131.6	1.23	19,309	1,602,647	156,050	19,592,422	175.7	125.6	1.40	-8.2%	4.8%	-12.4%
2013	Excl OMEDs	112,348	94,979	10,419,833	92.7	109.7	0.85	31,407	2,606,781	126,386	13,026,614	115.9	103.1	1.12	-20.0%	6.4%	-24.9%
2014	Excl OMEDs	113,060	145,903	22,059,206	195.1	151.2	1.29	26,816	2,225,728	172,719	24,284,934	214.8	140.6	1.53	-9.2%	7.5%	-15.5%
2015	Excl OMEDs	114,138	155,786	18,921,044	165.8	121.5	1.36	14,681	1,218,523	170,467	20,139,567	176.4	118.1	1.49	-6.1%	2.8%	-8.6%
2009	No Exclusions	108,658	173,432	29,796,340	274.2	171.8	1.60										
2010	No Exclusions	110,843	204,742	27,094,923	244.4	132.3	1.85										
2011	No Exclusions	110,301	242,429	40,312,088	365.5	166.3	2.20	8,615	715,045	251,044	41,027,133	372.0	163.4	2.28	-1.7%	1.7%	-3.4%
2012	No Exclusions	111,489	299,284	356,309,272	3,195.9	1,190.5	2.68	22,427	1,861,441	321,711	358,170,713	3,212.6	1,113.3	2.89	-0.5%	6.9%	-7.0%
2013	No Exclusions	112,348	106,431	14,574,711	129.7	136.9	0.95	31,407	2,606,781	137,838	17,181,492	152.9	124.6	1.23	-15.2%	9.9%	-22.8%
2013	No Exclusions	113,060	153,526	23,456,316	207.5	152.8	1.36	26,816	2,225,728	180,342	25,682,044	227.2	142.4	1.60	-8.7%	7.3%	-14.9%
2015	No Exclusions	114,138	164,717	20,575,864	180.3	124.9	1.44	17,737	1,472,171	182,454	22,048,035	193.2	120.8	1.60	-6.7%	3.4%	-9.7%

The orange columns of Table 1 show reliability performance as measured by several metrics for the seventy aggregate Phase 1 DACR circuits. The blue columns show the incremental customer interruptions ("CI") and customer minutes of interruption ("CMI") avoided with DACR deployed on the seventy Phase 1 DACR circuits. The purple columns show what the reliability of those seventy circuits *would have been* if the DACR

technology had *not* been installed. The green columns show the difference between reliability with DACR (orange) and reliability without DACR (purple). That is, the green columns show the reliability impacts, expressed in percentage improvement, attributable to the DACR technology. (For SAIFI, as well as CAIDI and SAIDI, a lower number indicates better reliability performance.)

As shown on the far right column of Table 1, the DACR technology improved SAIFI for the seventy aggregate Phase 1 circuits in every year with or without the influence of major events. Looking specifically at what Mr. Lanzalotta references on page 31, Table 6 of his testimony – i.e., SAIFI excluding major event outages ("Excl OMEDs" on Table 2) for 2013-2015 – the DACR technology helped improve SAIFI on these aggregate circuits by 24.9% in 2013, by 15.5% in 2014, and by 8.6% in 2015. These data are presented on Table 2 below.

Table 2 – Impact of DACR Technology on SAIFI for gridSMART Phase 1 Aggregate DACR Circuits Excluding Major Event Outages (2013-2015)

	2013	**2014**	**2015**
Actual SAIFI <u>With</u> DACR Installed	0.85	1.29	1.36
What SAIFI Would Have Been <u>Without</u> DACR Installed	1.12	1.53	1.49
Impact of DACR Technology (Negative Number Is Improvement)	-0.27	-0.24	-0.13
	-24.9%	-15.5%	-8.6%

Table 2 above responds directly to the bottom row of Table 6 on page 31 of Mr. Lanzalotta's testimony. It shows that, although SAIFI on the aggregate Phase 1 DACR circuits increased in 2014 and 2015, the conclusions Mr. Lanzalotta draws from that are

incorrect. In fact, the DACR technology continued to improve SAIFI on the circuits where it was deployed – and provide significant customer reliability benefits – even as the circuits' SAIFI metric rose.

Q. MR. LANZALOTTA CRITICIZED THE TYPE OF COMPARISON PRESENTED IN TABLES 1 AND 2 BECAUSE THE "WITHOUT DACR" DATA REQUIRES THE COMPANY TO "ESTIMATE[ ] WHAT THE FEEDER PERFORMANCE WOULD BE IF IT DIDN'T HAVE THIS EQUIPMENT ON IT." (Tr. Vol. 2, at 387.) HOW WOULD YOU RESPOND TO THAT CRITCISM?

A. Mr. Lanzalotta's criticism is unfounded. The Company calculates the SAIFI "without DACR" data in Tables 1 and 2 above based on data logs kept by the DACR system and other logs, not based on any kind of guess or "estimate" as Mr. Lanzalotta claims.

When the DACR technology detects a fault, it analyzes the affected load and assesses whether there are reconfiguration options available. If reconfiguration options are available, the system selects the optimal choice, and commands are sent to reconfigure circuits to restore power to customers, typically within two minutes and almost always within the five minute threshold for a SAIFI-recordable customer outage.

As the DACR system performs these automated reconfigurations, it keeps a log of the outage data and the actions it took to reconfigure the system. AEP Ohio is then able to use this data, in combination with its customer database, to calculate the number of customers whose power was restored within five minutes by the DACR system. Once the Company knows the number of customers whose power was restored by the DACR

system, the Company knows how many more customers would have experienced a SAIFI-recordable outage if the DACR system had not been installed.[1]

Thus, the SAIFI "without DACR" data in Tables 1 and 2 above are reliable and provide an accurate assessment of the substantial SAIFI reliability gains AEP Ohio customers have experienced from DACR technology in Phase 1.

Q. INSTEAD OF THE TYPE OF COMPARISON PRESENTED IN TABLES 1 AND 2, MR. LANZALOTTA SAID THAT IT IS "MORE TELLING TO [HIM]" TO FOCUS ON YEAR-TO-YEAR SAIFI COMPARISONS FOR DACR CIRCUITS. (Tr. Vol. 2, at 388.) LIKEWISE, ON PAGES 32-33 OF HIS DIRECT TESTIMONY, MR. LANZALOTTA FOCUSED ON YEAR-TO-YEAR SAIFI TRENDS FOR PHASE 1 DACR CIRCUITS FROM 2013 TO 2015. IS IT APPROPRIATE TO USE ONLY YEAR-TO-YEAR SAIFI TRENDS TO EVALUATE THE PERFORMANCE OF THE DACR TECHNOLOGY IN PHASE 1?

A. No. SAIFI is an important metric for measuring reliability, and for that reason, the Company has committed in Section 2 of the Stipualtion to achieve a 15.8% annual SAIFI improvement attributatble to DACR on the aggregate circuits on which DACR is installed. Importantly, however, this SAIFI commitment is based on a three-year average, as opposed to the year-to-year trends that Mr. Lanzalotta focuses on. Moreover, there are several reasons why SAIFI trends (both three-year average and year-to-year) do not present a complete picture of the benefits or performance of DACR, and for this

[1] To calculate CAIDI without DACR (i.e., avoided CMI), the Company uses its past experience with outages in northeast Columbus before DACR was installed to reflect that it took, on average, 83 minutes to manually isolate and restore customers prior to the installation of DACR.

reason, Section 2 of the Stipulation contains a secondary metric if the SAIFI commitment is not achieved.

The most important limitation of using year-to-year SAIFI trends to measure DACR reliability – as Mr. Lanzalotta attempts to do in his testimony – is the fact that, as the Signatory Parties recognized in Section 2 of the Stipulation, "reliability improvement has many factors outside the Company's control." These impacts include weather-related outages,[2] animal-related outages, outages caused by vehicle accidents, and trees out of the right-of-way causing outages. AEP Ohio cannot control the weather, animals, or private vehicles, and there are limitations on the Company's ability to address trees out of the right-of-way. Yet the frequency of these types of outages from one year to the next can significantly impact SAIFI.

Additionally, outage location has a significant impact on reliability. For example, a lightning strike just outside a substation could cut off power to thousands of customers, while a lightning strike near the end of a distribution circuit could affect just one customer. (DACR technology is designed to limit some of these locational effects, but outage location remains an important driver of SAIFI and other performance metrics even with DACR.)

In sum, SAIFI and other reliability performance metrics can increase and decrease from year to year due to factors that are outside the Company's control and completely unrelated to DACR performance. The key point in response to Mr. Lanzalotta's selective use of SAIFI data is that DACR tends to make SAIFI performance *better than it would have been without DACR*, as shown on Tables 1 and 2 above. Thus, SAIFI is a valuable

[2] Major storm events are typically excluded from SAIFI metrics, but SAIFI is still significantly affected by the frequency and severity of weather-related events that fall short of the major event threshold.

tool to evaluate reliability performance, as recognized by AEP Ohio's SAIFI commitment contained in Section 2 of the Stipulation. But focusing on SAIFI trends in isolation, as Mr. Lanzalotta does, can provide an inaccurate picture of the reliability benefits attributable to DACR. In those circumstances, a direct comparison of reliability performance with and without DACR – as provided above in Tables 1 and 2 – can provide a more accurate way to show the significant customer reliability benefits that can be expected with the installation of DACR technology.

Q. ARE THERE ANY OTHER REASONS WHY MR. LANZALOTTA'S DISCUSSION OF SAIFI TRENDS IS MISLEADING?

A. Yes. In addition to the points addressed above, it is misleading for Mr. Lanzalotta to focus on the year-to-year change in Phase 1 circuit SAIFI performance for two further reasons. First, annual variations can affect SAIFI data. As opposed to Mr. Lanzalotta's approach of examining year-to-year performance from 2013 to 2015, it is more appropriate to assess SAIFI performance on a three-year average, as contemplated by Section 2 of the Stipulation. Second, Mr. Lanzalotta is comparing years in which DACR was already installed. In response to Mr. Lanzalotta's presentation, it is more appropriate to compare the circuits' SAIFI perforamnce before DACR was installed to the same circuits' SAIFI performance after DACR was installed.

In Table 3 below, I address these two flaws in Mr. Lanzalotta's presentation by comparing the three-year average SAIFI performance of the Phase 1 DACR circuits in 2008-2010 before DACR deployment to the most recent three-year average SAIFI performance of the Phase 1 DACR circuits after DACR deployment.

Table 3 – Comparison of Phase 1 Aggregate DACR Circuit SAIFI Performance on Three-Year Average Pre- and Post-Deployment

	SAIFI
2008-2010 Average Pre-Deployment	1.46
2013-2015 Average Post-Deployment	1.17
Reliability Improvement (Negative Number Is Improvement)	-20%

As shown on Table 3 above, the reliability performance of the aggregate Phase 1 DACR circuits in the most recent years has significantly outperformed those circuits' pre-DACR deployment, including a 20% SAIFI improvement. This is a more accurate measure of DACR performance than the selective data discussed by Mr. Lanzalotta on pages 32-33 of his direct testimony.

PHASE 1 DACR CIRCUIT CUSTOMER INTERRUPTIONS

Q. ON PAGE 30, LINES 14-17 OF HIS TESTIMONY, MR. LANZALOTTA STATES THAT AEP OHIO'S GRIDSMART PHASE 1 DACR CIRCUITS "HAD MORE CUSTOMER INTERRUPTIONS IN 2014 THAN IN 2013, AND MORE CUSTOMER INTERRUPTIONS IN 2015 THAN IN 2014." IS THAT AN APPROPRIATE METHOD OF ASSESSING DACR PERFORMANCE?

A. No. As stated previously, factors outside AEP Ohio's control have a significant impact on reliability metrics such as the number of customer interruptions ("CI") and the number of customer minutes of interruption ("CMI"). The key factor showing that DACR had a positive impact on reliability is not the *total* number of CI and CMI on the circuit (which Mr. Lanzalotta cites), but rather the number of *avoided* CI and CMI attributable to the

DACR systems. Avoided CI and CMI are shown on the blue columns of Table 1 above, and the relevant data are produced again on Table 4 below.

Table 4 – Avoided CI and CMI for Phase 1 DACR Circuits Excluding Major Events

			DACR Savings	
Year	Exclusions	Customers Served	Avoided CI	Avoided CMI
2009	Excl OMEDs	108,658		
2010	Excl OMEDs	110,843		
2011	Excl OMEDs	110,301	7,427	616,441
2012	Excl OMEDs	111,489	19,309	1,602,647
2013	Excl OMEDs	112,348	31,407	2,606,781
2014	Excl OMEDs	113,060	26,816	2,225,728
2015	Excl OMEDs	114,138	14,681	1,218,523

As shown here, the Phase 1 DACR technology has avoided tens of thousands of CI and millions of CMI. Based on this Phase 1 performance, AEP Ohio anticipates that the Phase 2 DACR circuits will avoid up to 21 million CMI annually.

SYSTEM-WIDE RELIABILITY

Q. MR. LANZALOTTA ASSERTS ON PAGES 30-31 OF HIS DIRECT TESTIMONY THAT AEP OHIO EXPERIENCED A DECLINE IN SYSTEM-WIDE RELIABILITY PERFORMANCE IN 2014 AND 2015. FIRST OF ALL, IS IT APPROPRIATE TO MEASURE PHASE 1 DACR PERFORMANCE BASED ON SYSTEM-WIDE METRICS?

A. No. There are 70 DACR circuits in Phase 1, whereas the Company has approximately 1,600 distribution circuits, of which about 1,500 serve more than one customer. Moreover, there are approximately 114,000 customers served from the Phase 1 DACR circuits, whereas the Company has about 1,450,000 total Ohio customers. Thus, Phase 1 DACR circuits are less than five percent of the Company's circuit count and

serve only about eight percent of its customers. The Phase 1 DACR systems do not have a significant impact on system-wide reliability reporting even though they are delivering significant benefits to customers in Phase 1.

Q. DID AEP OHIO FAIL TO MEET ITS SYSTEM-WIDE PERFORMANCE STANDARDS IN THE YEARS CITED BY MR. LANZALOTTA?

A. No. AEP Ohio met its system-wide SAIFI and CAIDI performance standards in 2014 and 2015. Although system-wide SAIFI and CAIDI metrics increased in 2014 and 2015 (as compared to 2013), they were still below AEP Ohio's established standards, as shown on Table 5 below.

Table 5 – AEP Ohio's System-Wide Performance Metrics (2013-2015)

	2013	**2014**	**2015**
System-Wide SAIFI Actual	1.03	1.13	1.13
System-Wide SAIFI Performance Standard	1.20	1.20	1.20
System-Wide CAIDI Actual	140.97	146.61	139.03
System-Wide CAIDI Performance Standard	150.00	150.00	150.00

Q. DOES THIS CONCLUDE YOUR REBUTTALTESTIMONY?

A. Yes.

AEP-OH Phase 1 DACR Impacts (70 Circuits)

All outage causes

			With DACR					DACR Savings		Without DACR					DACR Impact		
Year	Exclusions	Customers Served	Customers Interrupted	Customer Minutes	SAIDI	CAIDI	SAIFI	Avoided CI	Avoided CMI	Customers Interrupted	Customer Minutes	SAIDI	CAIDI	SAIFI	SAIDI	CAIDI	SAIFI
2009	Excl OMEDs	108,658	146,665	14,642,859	134.8	99.8	1.35										
2010	Excl OMEDs	110,843	159,770	17,245,941	155.6	107.9	1.44										
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2015	No Exclusions	114,138	164,717	20,575,864	180.3	124.9	1.44	17,737	1,472,171	182,454	22,048,035	193.2	120.8	1.60	-6.7%	3.4%	-9.7%

CERTIFICATE OF SERVICE

In accordance with Rule 4901-1-05, Ohio Administrative Code, the PUCO's e-filing system will electronically serve notice of the filing of this document upon the following parties. In addition, I hereby certify that a service copy of the foregoing *Rebuttal Testimony of Scott S. Osterholt* was sent by, or on behalf of, the undersigned counsel to the following parties of record this 8th day of August 2016, via electronic transmission.

/s/ Steven T. Nourse
Steven T. Nourse

EMAIL SERVICE LIST

campbell@whitt-sturtevant.com;
cmooney@ohiopartners.org;
dborchers@bricker.com
dclark1@aep.com;
glpetrucci@vorys.com;
haydenm@firstenergycorp.com;
jennifer.lause@directenergy.com;
jfinnigan@edf.org;
joseph.clark@directenergy.com;
kfield@elpc.org
Bojko@carpenterlipps.com
mfleisher@elpc.org;
mpritchard@mwncmh.com
msmckenzie@aep.com;
mswhite@igsenergy.com;
mjsettineri@vorys.com
MWarnock@bricker.com
ricks@ohanet.org;
scasto@firstenergycorp.com;
stnourse@aep.com;
tdougherty@theoec.org;
terry.etter@occ.ohio.gov;
vparisi@igsenergy.com;
whitt@whitt-sturtevant.com;
werner.margard@ohioattorneygeneral.gov

Summary: Testimony - Rebuttal Testimony of Scott S. Osterholt on Behalf of Ohio Power Company electronically filed by Mr. Steven T Nourse on behalf of Ohio Power Company