BEFORE THE PUBLIC UTILITIES COMMISSION OF OHIO

In the Matter of the Application of Ohio Edison Company, The Cleveland Electric Illuminating Company, and The Toledo Edison Company for Approval of Ohio Site Deployment of the Smart Grid Modernization Initiative and Timely Recovery of Associated Costs

Case No. 09-1820-EL-ATA Case No. 09-1821-EL-GRD Case No. 09-1822-EL-EEC Case No. 09-1823-EL-AAM

REPORT

On May 28, 2015, the Commission issued a Finding and Order ("Order") granting Ohio Edison Company, The Cleveland Electric Illuminating Company and The Toledo Edison Company's (collectively, the "Companies") Application to Complete studies related to the Ohio Site Deployment of the Smart Grid Program. In that Order, the Commission ordered the Companies to file an interim report regarding the data obtained from the Volt Var Optimization and Distribution Automation studies annually. The Companies hereby submit their annual interim report for the period ending May 31, 2018.

Distribution Automation (DA)

For the thirty-four circuits with DA, the Companies analyzed the impact of DA on reliability metrics, excluding major storms, and also performed a separate analysis for major storms only. To make this comparison, the Companies analyzed the average of the five-year reliability metrics for (SAIDI and SAIFI) for those circuits for years 2005 through 2009 and compared the results to outage data from June 1, 2014 through May 31, 2018. The results, excluding major storms, were:

Four Year Annualized Smart Grid Circuit Performance (June 2014 thru May 2018)								
	Customers		Customers					
	Interrupted	СМІ	Served	SAIFI	SAIDI			
5 Yr Avg (2005-2009)	64,281	7,678,800	42,790	1.50	179.45			
Smart Grid Circuits (12 Mo. Avg.)	61,637	5,869,627	45,255	1.36	129.70			
Savings	2,644	1,809,173		0.14	49.75			
	% Improvement 9% 28%							
Notes								
1. Outages include, Distribution, Substation, and Transmission, excludes major storms								
2. Reliability improvements are only conclusive after 5 years of data collection and analysis								
3. Includes tap outage	3. Includes tap outages that would not have been affected by Smart Grid facilities							

The results for major storms were:

Annualized Major Storm Performance (June 2014 thru May 2018)								
	Customers	Customers						
	Interrupted	СМІ	Served	SAIFI	SAIDI			
5 Yr Avg (2005-2009)	21,270	9,068,648	42,790	0.50	211.93			
Smart Grid Circuits (12 Mo. Avg.)	13,488	5,206,537	45,362	0.30	114.78			
Savings	7,782	3,862,111		0.20	97.16			
		40%	46%					
Notes								
1. Outages include Distribution, Substation, and Transmission for major storms								
2. Outages capped at 24 hours.								
3. Storm improvements are only conclusive after 5 years of data collection and analysis								
4. Includes tap outages that would not have been affected by Smart Grid facilities								

Integrated Volt Var Control (IVVC)

During the period June 1, 2017 through May 31, 2018, the Companies continued to operate and monitor the performance of the IVVC equipment in the Smart Grid pilot area. The Companies analyzed six core substations and eighteen circuits deployed with IVVC during the month of May 2018. During this period, two primary operational modes for the IVVC were used:

 Minimize Demand (MnDm): This operational setting is used to reduce customer usage and to minimize peak demand, both on a circuit and substation level. This setting will lower circuit voltages to the lower end of the allowable range and could impact power quality. The voltage range for MnDm is 117v low to 120v high. 2. Maximum Power Quality (MxPQ): This operational setting is used to mitigate power quality issues that may be created following operational switching to restore customers or by one customer that impacts other customers on the circuit. This setting typically causes voltage to increase. The voltage range for MxPQ is 122.5v low to 125v high.

The table below summarizes the operational performance of the IVVC system during the month of May 2018.

May 2018										
		Operational Mode Days		Voltage Reduction	Average kWh/day	Average kWh/day	Peak kW			
Substation	Circuits	MinDm	MxPQ	(Volts)	Reduction	Savings	reduction			
1	4	9.2	11.3	1.24	3,889	3.0%	5.8%			
2	4	8.8	12.4	0.14	4,554	2.4%	8.2%			
3	2	9.3	12.5	0.72	2,934	2.2%	3.7%			
4	2	9.3	12.7	0.61	4,924	2.9%	0.0%			
5	2	9.3	12.5	0.29	2,677	2.5%	3.9%			
6	4	9.3	12.3	1.02	3,110	1.1%	5.9%			
5 6	2 4	9.3 9.3	12.5 12.3	0.29 1.02	2,677 3,110	2.5% 1.1%	3.9% 5.9%			

Note: No reduction achieved at Substation 4 during the peak, however savings occurred at other times during the day.

Some key takeaways from this table are

- On average, the IVVC system operated 9.2 days in MnDm and 12.3 days in MaxPQ.
- The overall range of voltage reduction was 0.14 to 1.24 volts.
- On average, the IVVC system created kWh savings of 2.3% by reducing voltage 0.71 volts on average, per circuit.
- Average peak demand reduction was 5.3%.

Through four years of operational experience, the Companies continue to explore ways to further enhance both the software and the reliability and power quality performance of field devices, including increasing single phase trip, where possible, to lower the number of customer interruptions caused by single phase faults, working with their DA/IVVC vendor to modify software to get better system performance, and leveraging worst performing circuit mitigation to improve the performance of

the thirty-four circuits with DA and IVVC, where applicable.

The Companies will continue collecting data associated with the modes of operation and will provide further results in their next annual report.

Respectfully submitted,

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CERTIFICATE OF SERVICE

On August 10, 2018, the foregoing document was filed on the Public Utilities Commission of Ohio's Docketing Information System. The Commission's e-filing system will electronically serve notice of the filing of this document, and the undersigned has served electronic copies to the following parties:

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Summary: Report Annual Interim Report electronically filed by Mr. Joshua R. Eckert on behalf of Ohio Edison Company and The Cleveland Electric Illuminating Company and The Toledo Edison Company