

**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 (“CEI”) and The Toledo Edison Company’s (collectively, “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 within 60 days from the date of the Order and annually thereafter. The Companies hereby submit their interim report on Smart Grid performance from the Smart Grid in-service date of June 1, 2014 through May 31, 2017.

**Distribution Automation**

For the 34 Smart Grid Circuits, the Companies, in order to benchmark the pilot area’s reliability metrics, averaged the 5 year reliability metrics for that area (SAIDI and SAIFI) for years 2005 through 2009. Then, the Companies collected outage data from June 1, 2014 through May 31, 2017. The results were:

### **Three Year Annualized Smart Grid Circuit Performance (June 2014 - May 2017)**

	Customers Interrupted	CMI	Customers Served	SAIFI	SAIDI
5 Yr Avg (2005-2009)	64,818	7,681,489	42,790	1.515	179.515
Smart Grid Circuits (12 Mo. Avg.)	60,946	6,056,711	45,578	1.337	132.887
Savings	3,872	1,624,778		0.178	46.628
			% Improvement	12%	26%

#### 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 outages that would not have been affected by Smart Grid facilities

## **Integrated Volt Var Control**

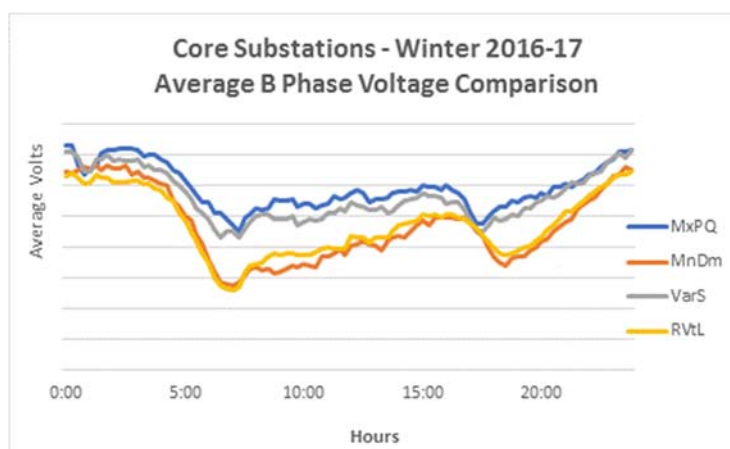
There are five different Operational Settings that support the goals that the Companies identified when piloting IVVC:

- *Maximum Power Quality (Max PQ)* – This operational setting is used to mitigate power quality issues that may be generated by one customer that impacts other customers on the circuit. This setting typically causes voltage to increase.
- *Minimize Demand (MnDm)* – This operational setting is used to reduce customer usage and to mitigate substation equipment overloads. This setting will lower circuit voltages to the lower end of the allowable range and could impact power quality.
- *Var Support (VarS)* – This operational setting is used to support Var loading on the transmission system, providing additional transmission capacity and the best system stability. This setting brings on as much capacitance as possible and maintains voltage within limits by controlling Load Tap Changers (“LTCs”) and line regulators. The typical impact on voltage of this setting ranges from neutral to an increase.
- *Minimize Device Operations (Respect Voltage Limits/RVtL)* – This operational setting is used to reduce tap change operations on both LTCs and line regulators and to reduce capacitor switching. This mode of operation allows the voltage to fluctuate throughout the full voltage bandwidth, but still within ANSI limits. The typical impact on voltage of this setting is neutral.

The table below indicates the operational bandwidth between each of the settings:

OPERATIONAL SETTING	OPTIMIZATON BOUNDARIES		OPERATIONAL BANDWIDTH
	Bus Low Limit	Bus High Limit	Max - Min
Max Power Quality	122.5	125.0	2.5
Minimize Demand	117.0	120.0	3.0
Var Support	121.0	125.0	4.0
Respect Voltage Limits	117.0	125.0	8.0

CEI's IVVC system in the pilot footprint includes seven core substations with twenty-three circuits where the software utilizes LTC and capacitor control. These core substations provide the most comprehensive data on IVVC performance available to CEI. The graph below represents average daily B phase voltage for these seven core substations for the winter months 2016/17. The graph indicates that the IVVC software can meet multiple distribution voltage objectives.



The Companies will continue collecting data associated with the modes of operation and will provide further results in their next annual report due on or around July 27, 2018.

Respectfully submitted,

/s/ Carrie M. Dunn-Lucco

Carrie M. Dunn-Lucco (0076952)

Counsel of Record

FIRSTENERGY SERVICE COMPANY

76 South Main Street

Akron, OH 44308

(330) 761-2352

(330) 384-3875 (fax)

cdunn@firstenergycorp.com

*Attorney for Ohio Edison Company, The Cleveland  
Electric Illuminating Company, and The Toledo  
Edison Company*

### **CERTIFICATE OF SERVICE**

On July 28, 2017, the foregoing document was filed on the Public Utilities Commission of Ohio's Docketing Information System. The PUCO'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:

IEU ([sam@mwncmh.com](mailto:sam@mwncmh.com))

OPAE ([cmooney2@columbus.rr.com](mailto:cmooney2@columbus.rr.com))

OEG ([dboehm@bkllawfirm.com](mailto:dboehm@bkllawfirm.com))

OEG ([mkl@bbrslaw.com](mailto:mkl@bbrslaw.com))

Citizen Power ([robinson@citizenpower.com](mailto:robinson@citizenpower.com))

Staff ([william.wright@puc.state.oh.us](mailto:william.wright@puc.state.oh.us))

([myurick@taftlaw.com](mailto:myurick@taftlaw.com))

OCC [sauer@occ.ohio.gov](mailto:sauer@occ.ohio.gov); [kern@occ.ohio.gov](mailto:kern@occ.ohio.gov)

[meissnerjoseph@yahoo.com](mailto:meissnerjoseph@yahoo.com)

/s/ Carrie M. Dunn-Lucco  
*One of the Attorneys for Ohio Edison  
Company, The Cleveland Electric Illuminating  
Company and The Toledo Edison Company*

**This foregoing document was electronically filed with the Public Utilities**

**Commission of Ohio Docketing Information System on**

**7/28/2017 2:01:13 PM**

**in**

**Case No(s). 09-1820-EL-ATA, 09-1821-EL-GRD, 09-1822-EL-EEC, 09-1823-EL-AAM**

Summary: Report electronically filed by Ms. Carrie M Dunn-Lucco on behalf of The Cleveland Electric Illuminating Company and The Toledo Edison Company and Ohio Edison Company