

OCC EXHIBIT NO._____

**BEFORE
THE PUBLIC UTILITIES COMMISSION OF OHIO**

In the Matter of the Application of)
Duke Energy Ohio, Inc., to Adjust Rider) Case No. 15-883-GE-RDR
DR-IM and Rider AU for 2014 Grid)
Modernization Costs.)

DIRECT TESTIMONY OF JAMES D. WILLIAMS

On Behalf of
The Office of the Ohio Consumers' Counsel
10 West Broad Street, Suite 1800
Columbus, Ohio 43215-3485

December 9, 2015

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ATTACHMENTS

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JDW-2	Duke Energy Ohio SmartGrid Non-Financial Metrics 2014 Annual Report
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1 **I. INTRODUCTION**

2

3 ***Q1. PLEASE STATE YOUR NAME, BUSINESS ADDRESS, AND POSITION.***

4 ***A1.*** My name is James D. Williams. My business address is 10 West Broad Street,
5 18th Floor, Columbus, Ohio, 43215-3485. I am employed by the Office of the
6 Ohio Consumers' Counsel ("OCC") as a Senior Consumer Protection Research
7 Analyst.

8

9 ***Q2. PLEASE BRIEFLY SUMMARIZE YOUR EDUCATION AND***

10 ***PROFESSIONAL EXPERIENCE***

11 ***A2.*** I am a 1994 graduate of Webster University, in St. Louis, Missouri, with a Master
12 in Business Administration, and a 1978 graduate of Franklin University, in
13 Columbus, Ohio, with a Bachelor of Science, Engineering Technology. My
14 professional experience includes a career in the Air Force and over 18 years of
15 utility regulatory experience with the OCC.

16

17 Initially, I served as a compliance specialist with the OCC and my duties included
18 the development of compliance programs for electric, natural gas, and water
19 industries. Later, I was appointed to manage all of the agency's compliance
20 specialists who were developing compliance programs in each of the utility
21 industries. My role evolved into the management of the OCC consumer hotline,
22 the direct service provided to consumers to resolve complaints, and inquiries that
23 involved Ohio utilities. More recently, as a Senior Consumer Protection Research

Analyst, I am responsible for investigating and recommending policy positions on issues that affect residential consumers.

My experience has allowed me to assist in the formulation of OCC positions in rulemakings such as the Electric Service Safety Standards,¹ set forth in Ohio Administrative Code 4901:1-10. As it relates to this proceeding, my experience includes reviewing the reasonableness of reliability performance standards proposed by Duke Energy Ohio (“Duke” or “Utility”)² and other cases such as grid modernization (also known as “SmartGrid”) that potentially effect service quality and reliability. I assisted in the preparation of OCC comments in this proceeding.

Q3. HAVE YOU PREVIOUSLY SUBMITTED TESTIMONY OR TESTIFIED BEFORE THE PUCO?

A3. Yes. The cases in which I have submitted testimony and/or have testified before the PUCO can be found in Attachment JDW-1.

¹ *In the Matter of the Commission's Review of Chapters 4901:1-10 of the Ohio Administrative Code Regarding Electric Companies*, Case No. 12-2050-EL-ORD.

² *In the Matter of the Application of the Duke Energy Ohio, Inc. to Establish Minimum Reliability Performance Standards Pursuant to Chapter 4901:1-10, Ohio Administrative Code*, Case No. 09-757-EL-ESS and Case No. 13-1539-EL-ESS.

1 **II. PURPOSE OF MY TESTIMONY**

2
3 ***Q4. WHAT IS THE PURPOSE OF YOUR TESTIMONY IN THIS***
4 ***PROCEEDING?***

5 ***A4.*** The purpose of my testimony is to point out certain shortfalls of the Duke
6 SmartGrid program and make recommendations to improve the program
7 for the benefit of customers who continue to pay millions of dollars to
8 support it.³

9
10 The performance of the “self-healing teams” may not be providing all the
11 benefits that they should for customers. I am recommending that the
12 PUCO not require Duke’s customers to pay for any costs associated with
13 the 20 times Duke’s self-healing teams failed to operate as designed in
14 2014.

15
16 Furthermore, I urge the PUCO to mandate a minimum performance level
17 of a 90 percent success rate before Duke can collect any additional costs
18 related to self-healing teams from consumers. The performance of Duke’s
19 self-healing teams should be on par with AEP Ohio’s self-healing team
20 performance. And there should be specific reporting of self-healing team
21 operations during major events.

³ *In the Matter of the Application of Duke Energy Ohio, Inc., for Approval of an Electric Security Plan, Case No. 08-920-EL-SSO, Opinion and Order (December 17, 2008).*

1 **III. SELF-HEALING TEAM PERFORMANCE**

2

3 ***Q5. WHAT ARE “SELF-HEALING TEAMS”?***

4 **A5.** The term “self-healing teams” refers to a component of the Distribution
5 Automation (“DA”) portion of Duke’s SmartGrid, which involves a set of
6 automated switches, sensors, and controls that can reconfigure circuits to re-route
7 electricity around a fault to reduce the number of customers on a circuit who
8 would otherwise lose electricity. Self-healing teams were installed on the system
9 to more efficiently detect and isolate outages on distribution lines to benefit
10 consumers. Ultimately, the intent of the self-healing teams is to lessen the impact
11 of outages on consumers – not just to add more expensive sophistication to the
12 system that is not used and useful.

13

14 ***Q6. HOW MANY SELF-HEALING TEAMS HAVE BEEN INSTALLED BY***
15 ***DUKE AND HOW HAVE THEY PERFORMED?***

16 **A6.** Based upon Duke’s SmartGrid reporting for 2014 (attached herein as Attachment
17 JDW-2), 30 self-healing teams have been installed.⁴ However, of the 75 times
18 that the self-healing teams operated in 2014, only 55 of the operations (73
19 percent) successfully kept customers from losing service by automatically
20 rerouting the electricity around the outage. The 20 unsuccessful operations of the
21 self-healing teams caused Duke’s customers to endure outages that should have

⁴ Duke Energy Ohio SmartGrid Non-Financial Metrics 2014 Annual Report.

1 been avoided had the SmartGrid functioned properly. The 2014 performance of
2 Duke's self-healing teams was a little better than the results from the previous
3 year. In 2013, the self-healing teams operated successfully 27 of the 42 times that
4 they should have operated – a dismal 64 percent success rate. By comparison,
5 AEP Ohio self-healing teams operated successfully 47 of the 49 times they were
6 called up to operate – a 95.9 percent success rate.⁵ The AEP Ohio self-healing
7 team performance has consistently improved as the PUCO emphasized its
8 expectations concerning self-healing team performance.⁶ The lackluster
9 performance of Duke's self-healing teams in 2013 and 2014 and their impact on
10 consumers warrant reducing the amount of costs Duke may collect from
11 customers.

12
13 ***Q7. DID OCC ADDRESS THE ISSUES OF DUKE'S SELF-HEALING TEAM***
14 ***PERFORMANCE IN LAST YEAR'S GRID MODERNIZATION CASE?***

15 ***A7.*** Yes. In last year's proceeding, OCC raised the issue of the self-healing team
16 performance. OCC questioned at that time the prudence of the costs associated
17 with the failed self-healing teams and recommended that the PUCO disallow all
18 costs associated with self-healing teams that failed to operate.⁷ OCC
19 recommended that Duke not be allowed to charge customers for costs associated

⁵ *In the Matter of the Application of Ohio Power Company to Update Its gridSMART Rider Rates*, Case 15-240-EL-RDR.

⁶ See *In the Matter of the Application of Ohio Power Company to Update Its gridSMART Rider*, Case No. 13-345-EL-RDR, Comments Submitted on Behalf of the Staff of the Public Utilities Commission of Ohio (August 2, 2013) at 7 (Staff stated that a success rate of only 60% with regard to self-healing teams falls below Staff's expectations.).

⁷ Case 14-1051-GE-RDR, Testimony of OCC witness James Williams (December 31, 2014) at 5.

1 with self-healing teams until the Utility can demonstrate that the self-healing
2 teams operate successfully at least 90 percent of the time. Finally, OCC raised
3 concerns about the lack of transparency in the reporting of issues related to self-
4 healing team failures. Specifically, these concerns involved the need for more
5 fact-based information about the cause of each self-healing team failure and about
6 corrective measures.⁸ Further, OCC addressed the need for identifying self-
7 healing team performance specifically during major events when the distribution
8 system is stressed beyond normal parameters.⁹

9
10 ***Q8. HOW DID THE PUCO ADDRESS THE 2013 SELF-HEALING TEAM***
11 ***PERFORMANCE ISSUE?***

12 ***A8.*** The PUCO gave Duke an additional year to demonstrate the cost effectiveness of
13 the self-healing team technology. The PUCO ruled in the Second Entry on
14 Rehearing as follows:

15 As we stated in our Order, the Commission believes it is prudent to
16 wait for Duke's 2015 Non-Cost Metrics Report, which includes
17 data regarding the failures and usage of self-healing teams, before
18 making any decisions with respect to the cost effectiveness of
19 Duke's self-healing teams' technology.¹⁰

20

⁸ Id.

⁹ Id.

¹⁰ Case 14-1051-GE-RDR, Second Entry on Rehearing (July 1, 2015) at 7.

1 Duke has now had that additional year to collect even more money from
2 customers to implement its smart grid program. Yet, Duke's self-healing teams
3 continue to operate at unacceptable levels. Now, the PUCO should not allow
4 Duke to collect any costs associated with the 20 failed self-healing team
5 operations from consumers. Duke began installing self-healing teams in 2011 and
6 now has a full five years of experience in operationally using self-healing teams.
7 Duke must be held accountable for ensuring that its investments in self-healing
8 teams were prudently incurred and are used and useful in providing service to
9 customers.

10
11 ***Q9. HAS THE PUCO REQUIRED DUKE TO PROVIDE ADDITIONAL***
12 ***REPORTING ON THE PERFORMANCE OF THE SELF-HEALING***
13 ***TEAMS?***

14 ***A9.*** Yes. In Case No. 13-1141-GE-RDR, the PUCO approved a Stipulation that
15 among other things, required Duke to provide more detailed information about the
16 operations of the self-healing teams. The Opinion and Order ("O&O") in that
17 case states¹¹:

18 Duke shall track and provide a report on the following within its
19 non-cost metrics annual report that shall be filed in its SmartGrid
20 rider applications: the number of times when Duke's self-healing
21 teams were called upon in outages to operate; the number of

¹¹ *In the Matter of the Application of Duke Energy Ohio, Inc., to Adjust Rider DR-IM and Rider AU for 2013 SmartGrid Costs*, Case No. 13-1141-GE-RDR, Opinion and Order (April 9, 2014) at 9.

1 instances when such teams operated; and the number of instances
2 when they failed to operate. *Further, Duke will identify causes of*
3 *failures, to the extent feasible, and corrective action taken to*
4 *correct the cause of failure to avoid future failure of self-healing*
5 *teams.* (Emphasis added).

6
7 ***Q10. IS DUKE IN COMPLIANCE WITH THE O&O IN CASE NO. 13-1141-GE-***
8 ***RDR?***

9 ***A10.*** No. As can be seen in JDW-2, Duke only reports the total number of self-healing
10 team operations, the number of successful operations of self-healing teams, and
11 the number of self-healing team failures. There is no reporting concerning the
12 cause of failures and corrective action taken to avoid future failures of self-
13 healing teams.

14
15 Even in the testimony of Duke's witness, only high-level summary information is
16 provided concerning reasons why the self-healing teams failed to operate.¹² For
17 example, Duke claims that telecommunications issues led to six of the missed
18 operations in 2014.¹³ Five of the missed operations were due to equipment
19 failures.¹⁴ Two of the missed operations were due to software logic issues.¹⁵

20 Two of the missed operations were due to device configuration issues and another

¹² Testimony of Duke witness Donald L. Schnieder (June 4, 2015) at 6-7.

¹³ Id. at 6.

¹⁴ Id.

¹⁵ Id.

1 two missed operations were due to system model issues.¹⁶ Finally, three of the
2 missed operations related to human performance.¹⁷ Even the responses to OCC
3 discovery requests (attached herein as JDW-3)¹⁸ include high-level information
4 making it difficult to determine the cause of the failure and to have any assurance
5 that the problem was adequately addressed. This is not sufficient content to
6 understand the cause of failure. Nor is this sufficient information to be assured
7 that the problems are addressed so that future failures of self-healing teams can be
8 avoided.

9
10 ***Q11. ARE THERE OTHER REPORTING ISSUES THAT YOU RECOMMEND***
11 ***THE PUCO ADDRESS?***

12 ***A11.*** Yes. In its response to OCC-INT-01-013 and OCC-INT-01-014 (attached herein
13 as JDW-4 and JDW-5), Duke claimed that it does not track operations of self-
14 healing teams during major events. Major events generally involve unusually
15 severe weather or other events that stress a utility's distribution system and cause
16 untypical outages.¹⁹ Customer outages that occur during major events are
17 excluded from the calculation of PUCO reliability standards. Because major
18 events can impact a large number of customers for an extended period of time, the

¹⁶ Id.

¹⁷ Id.

¹⁸ Duke Response to OCC-POD-01-016 (2014 PUCO Missed Operations Summary)

¹⁹ <http://www.puco.ohio.gov/puco/index.cfm/industry-information/statistical-reports/electric-reliability-performance-data/#sthash.fEVGhVbL.dpbs>.

1 contribution of the self-healing teams in reducing the total number of outages and
2 the duration of outages during these events is very important.

3
4 According to Duke's response to OCC-INT-02-025 (attached herein as JDW-6)
5 major event days occurred on January 25, June 16, and November 24, 2014.

6 According to JDW-3, there were two failed operations of self-healing teams on
7 November 24, 2014. One failure is attributed to an equipment failure and the
8 other to a device configuration failure. According to Duke's reliability report for
9 2014,²⁰ the cause of the outage on November 24, 2014 was wind.

10
11 There were 48,961 customers interrupted on this date for a total of 11,220,830
12 customer outage minutes. In this particular event, it appears as though the causes
13 for the two failures of the self-healing teams were independent of the major event.
14 Had the self-healing teams operated properly on November 24, 2014, fewer
15 customer outages would have occurred on a day when almost 50,000 Duke
16 customers were without service for approximately four hours on average.

²⁰ Case No. 15-581-EL-ESS <http://dis.puc.state.oh.us/TiffToPDF/A1001001A15D24B05722A15426.pdf>.

1 ***Q12. DO YOU HAVE A SPECIFIC RECOMMENDATION CONCERNING HOW***
2 ***DUKE SHOULD REPORT SELF-HEALING TEAM PERFORMANCE***
3 ***DURING MAJOR EVENTS?***

4 ***A12.*** Yes. To assist in evaluating the Utility's SmartGrid program, Duke should
5 provide reporting on both the number of successful operations and failed
6 operations of self-healing teams during major events. This reporting should
7 provide additional insight on any relationship between the cause of a failed
8 operation of the self-healing team and the major event. Furthermore, this
9 reporting should include customer outages avoided because of the self-healing
10 teams.

11

12 **IV. CONCLUSION**

13

14 ***Q13. DOES THIS CONCLUDE YOUR TESTIMONY?***

15 ***A13.*** Yes. However, I reserve the right to incorporate new information that may
16 subsequently become available through outstanding discovery or otherwise.

CERTIFICATE OF SERVICE

It is hereby certified that a true copy of the foregoing *Direct Testimony of James D. Williams on Behalf of the Office of the Ohio Consumers' Counsel* has been served via electronic transmission this 9th day of December 2015.

/s/Terry L. Etter
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Testimony of James D. Williams
Filed at the Public Utilities Commission of Ohio

1. *In the Matter of the Application of the Cincinnati Gas and Electric Company for an Increase in Its Rates for Gas Service to All Jurisdictional Customers, Case No. 95-0656-GA-AIR (August 12, 1996).*
2. *In the Matter of the Application of the Cincinnati Gas and Electric Company for an Increase in Its Rates for Gas Service to All Jurisdictional Customers, Case No. 01-1228-GA-AIR (February 15, 2002).*
3. *In the Matter of the Commission's Investigation into the Policies and Procedures of Ohio Power Company, Columbus Southern Power Company, The Cleveland Electric Illuminating Company, Ohio Edison Company, The Toledo Edison Company and Monongahela Power Company regarding installation of new line extensions, Case No. 01-2708-EL-COI (May 30, 2002).*
4. *In the Matter of the Application of The East Ohio Gas Company d/b/a Dominion East Ohio for an Increase in Its Rates for Gas Service to All Jurisdictional Customers, Case No. 07-0829-GA-AIR (June 23, 2008).*
5. *In the Matter of the Application of the Columbia Gas of Ohio, Inc. for Authority to Amend Filed Tariffs to Increase the Rates and Charges for Gas Distribution, Case No. 08-072-GA-AIR (September 25, 2008).*
6. *In the Matter of a Settlement Agreement Between the Staff of the Public Utilities Commission of Ohio, The Office of the Consumers' Counsel and Aqua Ohio, Inc. Relating to Compliance with Customer Service Terms and Conditions Outlined in the Stipulation and Recommendation in Case No. 07-564-WW-AIR and the Standards for Waterworks Companies and Disposal System Companies, Case No. 08-1125-WW-UNC (February 17, 2009).*
7. *In the Matter of the Application of the Ohio American Water Company to Increase its Rates for water and Sewer Services Provided to its Entire Service Area, Case No. 09-391-WS-AIR (January 4, 2010).*
8. *In the Matter of the Application of Aqua Ohio, Inc. for Authority to Increase its Rates and Charges in its Masury Division, Case No. 09-560-WW-AIR (February 22, 2010).*
9. *In the Matter of the Application of Aqua Ohio, Inc. for Authority to Increase its Rates and Charges in Its Lake Erie Division, Case No. 09-1044-WW-AIR (June 21, 2010).*

10. *In the Matter of the Application of The Ohio American Water Company to Increase its Rates for Water Service and Sewer Service*, Case No. 11-4161-WS-AIR (March 1, 2012).
11. *In the Matter of Columbus Southern Power Company and Ohio Power Company for Authority to Establish a Standard Service Offer Pursuant to Section 4928.143, Ohio Rev. Code, in the Form of an Electric Security Plan*, Case No. 11-346-EL-SSO, et al (May 4, 2012).
12. *In the Matter of the Application of The Dayton Power and Light Company for Approval of its Market Rate Offer*, Case No. 12-426-EL-SSO (June 13, 2012).
13. *In the Matter of the Application of Ohio Power Company to Establish Initial Storm Damage Recovery Rider Rates*, Case No. 12-3255-EL-RDR (December 27, 2013).
14. *In the Matter of the Application of Ohio Power Company for Authority to Establish a Standard Service Offer Pursuant to Section 4928.143, Ohio Rev. Code, in the Form of an Electric Security Plan*, Case No. 13-2385-EL-SSO (May 6, 2014).
15. *In the Matter of the Application of Duke Energy Ohio for Authority to Establish a Standard Service Offer Pursuant to Section 4928.143, Revised Code, in the Form of an Electric Security Plan, Accounting Modifications and Tariffs for Generation Service*, Case 14-841-EL-SSO (May 29, 2014).
16. *In the Matter of the Application of Ohio Edison Company, The Cleveland Electric Illuminating Company and The Toledo Edison Company for Authority to Provide for a Standard Service Offer Pursuant to R.C. 4928.143 in the Form of an Electric Security Plan*, Case No. 14-1297-EL-SSO (December 22, 2014).
17. *In the Matter of the Application of Duke Energy Ohio, Inc., to Adjust Rider DR-IM and Rider AU for 2013 Grid Modernization Costs*, Case No. 14-1051-EL-RDR (December 31, 2014) and (February 6, 2015).
18. *In the Matter of the Application Not for an Increase in Rates Pursuant to Section 4901:18, Revised Code, of Ohio Power Company to Establish Meter Opt Out Tariff*, Case No. 14-1158-EL-ATA (April 24, 2015).
19. *In the Matter of the Application of Duke Energy of Ohio, Inc., for Approval of a Grid Modernization Opt-out Tariff and for a Change in Accounting Procedures Including a Cost Recovery Mechanism.*, Case 14-1160-EL-UNC and 14-1161-EL-AAM (September 18, 2015).

20. *In the Matter of the Application of Duke Energy Ohio, Inc., for Approval of an Alternative Rate Plan Pursuant to Section 4929.05, Revised Code, for an Accelerated Service Line Replacement Programs*, Case No. 14-1622-GA-ALT (November 6, 2015).
21. *In the Matter of the Application of Duke Energy Ohio, Inc., to Adjust Rider DR-IM and Rider AU for 2014 Grid Modernization Costs*, Case No. 15-883-EL-RDR (December 9, 2015).



**Duke Energy Ohio
SmartGrid
Non-Financial Metrics
2014 Annual Report**

This 2014 Annual Report of non-financial metrics associated with the Advanced Metering Infrastructure (AMI) meter and SmartGrid deployment in Ohio, is submitted in accordance with the Stipulation and Recommendation that was approved by the Public Utilities Commission of Ohio, in the Opinion and Order in Case No. 10-2326-GE-RDR. The report compares Baseline with 2011 through 2014 performance.

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DE Ohio - 2014 Non-Financial Metrics Report

Metric	Baseline	2011	2012	2013	2014	Projected Steady State at 2015
# of Certified Gas Modules	0	205,579	318,982	387,034	440,394	440,000
# of Certified Electric Meters	0	294,494	477,965	623,909	706,593	720,000
# of Duke Energy Ohio employees – Gas Operations	210	135	129	134	142	135
# of Duke Energy Ohio employees – Power Delivery	643	409	278	276	235	585
Total delivered at Retail – Kwh	21,010,867,000	20,240,732,940	19,932,319,484	20,010,062,750	20,286,736,611	20,854,335,000 [1]
# of Installed & Certified Communication Nodes	0	71,036	116,802	139,849	139,993	138,000
Remote Order Fulfillments as % of Total Meter Orders [2]	0%	50.0%	66.3%	84.2%	93.9%	98.5%
# of Manual On-cycle Electric Meter Reads	8,585,006	6,230,211	4,020,651	2,115,646	775,985	25,000
# of Manual On-cycle Gas Meter Reads	5,374,353	3,883,768	2,506,380	1,296,687	475,604	220,000
# of Manual Off-cycle Electric Meter Reads	138,881	83,046	50,172	28,571	14,013	500
# of Manual Off-cycle Gas Meter Reads	85,120	50,899	30,750	17,511	8,588	3,000
# of Manual Electric Meter Reads	8,723,887	6,313,257	4,070,823	2,144,217	789,998	25,500
# of Manual Gas Meter Reads	5,459,473	3,934,667	2,537,130	1,314,198	484,192	223,000
# of Non-pay Disconnects - Electric [3]	65,841	70,328	81,451	82,399	86,345	[4]
# of Meter Readers (expressed in FTE)	135	103	74	60	48	10
Certified Meters as % of Planned Total Deployment	0.0%	43.1%	68.7%	87.2%	98.9%	98.5%
# of Meter Reading Routes	2,460	2,046	1,284	998	427	63
# of Handhelds Repaired	122	32	14	0	0	0
# of Handhelds Purchased	41	0	121	0	0	0
# of Non-AMI Meters Purchased	3,608	7,104	5,753	1,221	262	0
# of Meters Repaired - Mechanical	11,649	22,860	22,494	15,918	9,571	100
# of Meters Failed - Electric Smart Meter	0	116	800	1,850	275	2,200
# of Gas Modules Failed	73	183	58	516	101	550
# of Meter Reading Vehicles	117	115	106	82	78	12
Average Miles per Meter Reading Vehicle	10,619	10,153	3,684	9,562	7,080	[5]
# of Truck Rolls Avoided (Outage)	0	217	610	566	655	[2]
# of Truck Rolls Related to an Outage	19,877	30,601	42,952	38,383	45,166	[2]
# of Node-notified Storm Event Outages	0	0	148	102	163	[2]
# of Node-notified Outages	0	18	1,163	2,183	2,761	[2]
# of Self-Healing Teams Installed	0	17	24	30	30	30
# of Annual Customer Minutes Saved from Self-Healing	0	558,905	2,782,697	4,605,817	5,535,113	3,000,000
# of Successful Self-Healing Team Operations	-	8	10	27	55	[2]
# of Self-Healing Team Failures	-	-	-	15	20	[2]
Total # of SHT Operations	-	8	10	42	75	[2]
# of AMI Power Theft Cases Billed	0	839	1,198	1,288	876	1,250
% Capacitor Off-line	15.0%	5.2%	4.3%	2.2%	2.2%	[6]
# of Capacitor Banks Installed [7]	2,127	2,031	1,891	1,956	1,956	[6]

Footnotes

[1] Steady state represents the 2015 forecast per Duke's IRP filing in June 2012.

[2] Steady state is not applicable as numbers are dependent on factors outside of Duke Energy's control, including weather/storm activity.

[3] Baseline, 2011, and 2012 figures contain a small number of gas disconnects, as a specific breakout could not be determined. Data for 2013 and 2014 is electric only.

[4] Duke Energy Ohio is unable to forecast a steady state as the number of Non-Pay Disconnects is heavily influenced by economic conditions.

[5] Steady state cannot be determined until manual meter reading routes are defined at the conclusion of the deployment.

[6] Sufficient data does not yet exist to provide information on steady state.

[7] Numbers provided represent 3-phase distribution switched capacitors in the field.

As agreed in the meeting with Staff and OCC on Feb. 6, 2013, Duke Energy Ohio will submit a report titled Distribution System Efficiency Metrics with the annual cost recovery filing and as a result, "Line Loss & Unaccounted for Electric (Kwh)" and "Average System Voltage" have been removed from the Smart Grid Non-financial Metrics report.

2014 Duke Energy Ohio Self Healing Failed Operations Report

Ohio Self Healing Operations Summary	
Year	2014
Total Operations	75
Successful Operations	55
Failed Operations	20
% Successful	73%

Team	Date	Failure	Remediation Plan
23	1/4/2014	Telecommunications	Follow up to see if Cedarville RTU can be investigated and determine why there are frequent momentary communication issues. NOC and Telecom have confirmed issue is T1 dropping out and cell backup being activated. Telecom engineer working with T1 provider to find a solution. Ground connection was removed from positron isolation device and a repeater was replaced on the T1 line.
23	1/11/2014	Telecommunications	Follow up to see if Cedarville RTU can be investigated and determine why there are frequent momentary communication issues. NOC and Telecom have confirmed issue is T1 dropping out and cell backup being activated. Telecom engineer working with T1 provider to find a solution. Ground connection was removed from positron isolation device and a repeater was replaced on the T1 line.
32	1/21/2014	Software Logic	Follow up with Cooper to see if there is a work around or a future enhancement to eliminate a failed operation with upstream load < down stream load by a very small amount. Fixed in new Cooper Yukon release. Implemented March 2014.
24	1/27/2014	Software Logic	Failed due to target validity timer issue. Received new release from Cooper on 1/21/2014. Testing is in process. Fixed in new Cooper Yukon release. Implemented March 2014.
31	2/6/2014	System Modeling	Activate "Remote Enable" on CB 538 within EMS (this was done on 2/7/2014). EMS Support personnel verified the "Remote Enabled" flag was set for all other self-healing circuit breakers.
23	2/20/2014	Telecommunications	Follow up to see if Eastwood RTU can be investigated and determine why there are frequent momentary communication issues. NOC and Telecom have confirmed issue is T1 dropping out and cell backup being activated. Telecom engineer working with T1 provider to find a solution. Ground connection was removed from positron isolation device and a repeater was replaced on the T1 line.
31	4/11/2014	Device Configuration	System protection issued new settings for the backup relay to ensure it does not operate before the primary relay. Test and Relay department implemented the new settings on the substation relays on 4/17/2014 and investigated the cause for watchdog alarm on both the Hillcrest 51 and the Hillcrest 52 circuits. New settings installed and watchdog alarms resolved.
2	4/28/2014	Equipment Failure	Working with ABB and field personnel to determine why ABB OVR electronic recloser failed to open. Based on an error code found it was determined a failed digital input/output card used to control the reclosers caused the problem. This card was replaced.
25	5/20/2014	Equipment Failure	Based on symptoms and an error code it was determined that the digital input output card used to control the recloser had failed. This card was replaced.
30	5/27/2014	Telecommunications	Historical communications performance was reviewed and communications performance was monitored after this event. This recloser communicates successfully over 99% of the time. Unfortunately during this event the cellular signal was weak, blocked, or interrupted momentarily in some manner. No further action is necessary.
24	6/2/2014	Human Performance	Identified communications issue can occur if user does not log out of the relay and data concentrator correctly. This event was reviewed by the test and relay department and the proper logout procedure was reinforced.
31	6/22/2014	System Modeling	Activate "Remote Enable" on Trip reset for CB 423 within DMS. Corrected by DMS Support on 6/24/2014. DMS Support queried all devices on system to ensure this flag was correct for all devices.
28	6/23/2014	Telecommunications	Telecom department determined there was an AC powered communications device which lost power during this event causing the communications failure. Telecom to initiate project to install a battery backup at this location.
1	7/1/2014	Human Performance	Field personnel inadvertently left the self-healing switch in "local" mode after line work in the area was completed. Local mode prevents any automated action from taking place. Field personnel placed device back into supervisory mode on 7/3/2014.
4	7/13/2014	Human Performance	Operator manually override self-healing team process prior to opportunity for operation. Additional training has taken place since this event to reinforce that self-healing operations can take up to five minutes and that automation should not be disabled within five minutes of an event (unless there are compelling reasons to disable the team sooner).
1	10/16/2014	Equipment Failure	Failed Battery on self-healing switch. There was not a battery alarm generated prior to this event. Battery replaced 10/20/2014.
30	11/17/2014	Equipment Failure	Dielectric failure on recloser's load side bushing resulted in sustained fault. Device was under warranty and was replaced.
23	11/24/2014	Equipment Failure	Failed board inside recloser control caused analog and binary data points to be reported incorrectly. Failed communications card was replaced.
31	11/24/2014	Device Configuration	Configuration of substation RTU caused incorrect status information to be returned. This was resolved by Test and Relay the week of December 1st, 2014.
3	11/30/2014	Telecommunications	Field visit was performed and communications between the recloser and SCADA was restored by rebooting the cellular modem.

Acronym Description
CB Circuit Breaker

DMS	Distribution Management System (Used to control electronic reclosers and switches)
EMS	Energy Management System (Used to control circuit breakers)
NOC	Network Operations Center (Telecommunications operating center)
RTU	Remote Terminal Unit (Used to collect and transmit data from substations to SCADA system)

Duke Energy Ohio
Case No. 15-883-GE-RDR
OCC First Set Interrogatories
Date Received: July 2, 2015

OCC-INT-01-013

REQUEST:

For the 55 successful operations of the self-healing teams referenced on page 6, line 13 of Mr. Schneider's testimony, how many of the successful operations occurred during major event days?

RESPONSE:

Duke Energy Ohio did not track this information.

PERSON RESPONSIBLE: Legal

**Duke Energy Ohio
Case No. 15-883-GE-RDR
OCC First Set Interrogatories
Date Received: July 2, 2015**

OCC-INT-01-014

REQUEST:

For the 20 times that the self-healing teams did not work properly during 2014 referenced in Mr. Schneider's testimony on page 6, line 15, how many of the failed events occurred during major event days?

RESPONSE:

Duke Energy Ohio did not track this information.

PERSON RESPONSIBLE:

Legal

**Duke Energy Ohio
Case No. 15-883-GE-RDR
OCC Second Set Interrogatories
Date Received: October 16, 2015**

OCC-INT-02-025

REQUEST:

What were the dates that Duke considered to “major event days,” per the PUCO’s rules, during 2014?

RESPONSE:

The major event days in 2014 were January 25th, June 16th and November 24th.

PERSON RESPONSIBLE: Peggy Laub

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12/9/2015 5:17:01 PM

in

Case No(s). 15-0883-GE-RDR

Summary: Testimony Direct Testimony of James D. Williams on Behalf of the Office of the Ohio Consumers' Counsel electronically filed by Ms. Deb J. Bingham on behalf of Etter, Terry L.