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*OCC EXHIBIT NO.*_____

FILE

BEFORE
THE PUBLIC UTILITIES COMMISSION OF OHIO

In the Matter of the Application of Columbus Southern Power Company for Approval of its Electric Security Plan; an Amendment to its Corporate Separation Plan; and the Sale or Transfer of Certain Generation Assets.	)	Case No. 08-917-EL-SSO
In the Matter of the Application of Ohio Power Company for Approval of its Electric Security Plan; and an Amendment to its Corporate Separation Plan.	)	Case No. 08-918-EL-SSO

DIRECT TESTIMONY

of

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ON BEHALF OF
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I. INTRODUCTION

Q1. PLEASE STATE YOUR NAME, ADDRESS, AND POSITION.

A1. My name is David Cleaver. My business address is 10 West Broad Street, Suite 1800, Columbus, Ohio, 43215-3485. I am employed by the Office of the Ohio Consumers' Counsel ("OCC" or "Consumers' Counsel") as a senior electrical engineer-energy analyst.

Q2. PLEASE DESCRIBE YOUR EDUCATIONAL BACKGROUND AND PROFESSIONAL EXPERIENCE.

A2. I graduated from the University of Kentucky in 1973 with a Bachelor of Science degree in Electrical Engineering and from Morehead State University in 1987 with a Masters degree in Business Administration. I am also a registered professional engineer in the state of Ohio and Kentucky and hold certifications in Ohio as a Chief Building Official and a Residential Building Official. In addition, I was recently nominated to hold a seat as a governmental representative for the North American Electric Reliability Corporation ("NERC") Standards Committee. I have over 22 years of experience in the electric utility industry working for Kentucky Utilities Company as an Electrical Engineer from 1973-1977, Kentucky Power Company (an American Electric Power operating company) as a Distribution Engineer and then as a Power Engineer from 1977-1985, and American Electric Power Service Corporation as a Project Management & Construction Engineer and then as a Cost Control Engineer from 1985-1995. I have spent the past twelve years in the public sector working for the City of

Columbus and the State of Ohio. I started at the City of Columbus in 1996 as an electrical engineering plan examiner and then was promoted in 1997 to the position of Supervisor of the Plans Examination & Inspection Section of the Building Services Department, a unit totaling approximately 85 employees comprised of architects, engineers and building inspectors. In 2002, I took a similar position with the Division of Industrial Compliance as the electrical engineering plans examiner for the State of Ohio.

Q3. HOW MANY YEARS OF EXPERIENCE DO YOU HAVE WORKING DIRECTLY IN THE ELECTRIC UTILITY INDUSTRY?

A3. I have over 22 years of experience working directly for investor-owned electric utility companies. For the first fifteen years, I worked extensively on the engineering, design, and construction of new electrical distribution systems as well as the analysis and resolution of distribution circuit performance and reliability problems such as circuit overloads and unbalanced phases. In addition to providing solutions and action programs to solve reliability problems, I was involved directly with the implementation of operation and maintenance procedures to correct items such as voltage flicker and momentary outages. During the following seven-year period, my responsibilities were expanded to also include the engineering, design, construction and maintenance activities associated with transmission lines and stations (69 kV and above) and power plant systems.

1 ***Q4. WHAT PORTIONS OF YOUR WORK EXPERIENCE ARE RELATED TO***
2 ***THE DELIVERY OF RELIABLE ELECTRIC SERVICE?***
3 ***A4.*** All of my work experience, spanning more than thirty years and involving all
4 facets of the electric utility industry, are either directly or indirectly related to the
5 delivery of reliable electric service. Because electric transmission and
6 distribution systems are designed to last many decades and because utility
7 companies must "keep the lights on" in order to meet their obligation to serve
8 their customers and to make a profit, reliable service is the fundamental guiding
9 principle for all engineering activities.
10
11 ***Q5. WOULD YOU PLEASE PROVIDE SOME EXAMPLES OF YOUR WORK***
12 ***EXPERIENCE CONCENTRATING IN THE AREA OF ELECTRICAL***
13 ***DISTRIBUTION SYSTEMS?***
14 ***A5.*** I have extensive experience in the engineering, design, and construction of
15 underground distribution systems. This experience includes the construction of
16 the underground network grid serving downtown Lexington, Kentucky as well as
17 numerous underground residential distribution ("URD") systems for Kentucky
18 Utilities ("KU") Company. I was considered to be KU's URD utility expert and
19 was charged with responsibility of specifying equipment, creating a URD cable
20 testing program, and recommending operation and maintenance policies and
21 practices to company management. In the area of overhead distribution systems, I
22 have performed as an engineer and as an engineering supervisor responsible for
23 the design and construction of new lines and substations such as a 12kV to

34.5kV conversion project in Ashland, Kentucky. I have performed a variety of technical studies such as system capacity/overload studies and cold load pickup studies which are needed to properly operate and maintain distribution lines and substations. I have both performed and supervised the performance technical studies such as load flow analyses, voltage fluctuation studies, fault studies, and analyzed outage cause data to determine the adequacy of distribution facilities. Additionally, I have had direct oversight of numerous outage restoration activities during major storms as well as the supervision of routine pole and line/equipment inspection programs. Lastly, I have been directly responsible for a vegetation management program which includes utility employed arborists and contract tree trimming crews.

Q6. DID ANY OF YOUR WORK EXPERIENCE IN THE NON-UTILITY PUBLIC SECTOR ALSO INVOLVE THE RELIABILITY OF ELECTRICAL DISTRIBUTION SYSTEMS?

A6. Yes, it did.

Q7. WOULD YOU PLEASE PROVIDE SOME EXAMPLES OF THIS RELIABILITY-RELATED WORK EXPERIENCE?

A7. While working for both the City of Columbus and the State of Ohio, I reviewed and approved plans for electrical distribution systems for very large industrial customers, universities, penitentiaries, and other public institutions who owned their own electrical distribution facilities. I analyzed these entities' plans for

compliance with the structural and electrical requirements of the Ohio Building Code ("OBC") which are the minimum standards for new construction. The projects which I reviewed included overhead and underground lines, substations, transformers, voltage regulators, relays, switches, circuit breakers, capacitors, reclosers, and a variety of other equipment which was very similar to that installed by electric utility companies. In addition, I continued to analyze outage report data and one-line circuit diagrams of different electric utility companies to evaluate their service reliability. This information was provided by the electric utility company to one of the large entities mentioned above (i.e. Ohio University) who owned their own distribution facilities. This analysis was necessary to determine if and when a second source of emergency power (such as an emergency generator or a second feed from the utility) was required by the OBC for a high risk facility such as a high-rise apartment building or a hospital. The standard for reliability contained in the OBC is extremely high because these high-risk facilities contain life safety systems such as emergency lighting, sprinkler systems, fire alarms systems, smoke control systems, operating rooms, elevators, etc. An example of this high standard would be a hospital which was served by a circuit with an average interruption duration as low as 90 minutes per year, but would still be required to install an emergency power system.

1 ***Q8. ARE THERE ANY OTHER AREAS OF YOUR WORK EXPERIENCE***

2 ***WHICH ARE RELEVANT TO THIS PROCEEDING?***

3 ***A8.*** Yes, while working for American Electric Power Service Corporation

4 ("AEPSC"), I was responsible for providing cost/benefit analysis and scheduling

5 of large capital projects similar to those proposed by the Companies' in this ESP

6 Application to enhance service reliability.

7

8 ***Q9. HAVE YOU PREVIOUSLY TESTIFIED BEFORE THE PUBLIC UTILITIES***

9 ***COMMISSION OF OHIO?***

10 ***A9.*** Yes. I testified in the FirstEnergy Distribution Rate Case, Case No. 07-551-EL-

11 AIR, and the FirstEnergy Electric Security Plan ("ESP") Application, Case No.

12 08-935-EL-SSO on behalf of the OCC. That testimony addressed the reliability-

13 related policies and practices that are applied to the distribution systems of the

14 FirstEnergy electric distribution companies.

15

16 **II. PURPOSE OF TESTIMONY**

17 ***Q10. WHAT IS THE PURPOSE OF YOUR TESTIMONY IN THE CURRENT***

18 ***PROCEEDING?***

19 ***A10.*** My testimony, on behalf of OCC presents the results of my evaluation of the

20 reliability-related policies and practices that are applied to the distribution systems

21 of the AEP Ohio electric distribution companies, Columbus Southern Power

22 Company ("CSP") and Ohio Power Company ("OPC") (collectively, "AEP Ohio"

23 or "the Company"). My testimony also addresses the Company's proposed

Enhanced Service Reliability Plan ("ESRP"), a three-year program proposed in the Company's ESP. The Company asserts that the Plan was designed by AEP Ohio to modernize and improve the Company's energy-delivery distribution infrastructure. My evaluation compares the Company's policies, practices, and performance against typical industry practice, Ohio requirements, and against other standards of care. I also review the Company's proposed reliability programs contained in the Plan regarding need, reasonableness, and whether these programs really represent something beyond what utilities would normally be undertaking.

Q11. WHAT INFORMATION HAVE YOU REVIEWED IN PREPARING YOUR TESTIMONY?

A11. In preparing my testimony I have reviewed documents such as the Company's ESP Application, the testimony of the AEP Ohio witnesses, responses to OCC's discovery, responses to discovery by other interveners, and responses to Staff data requests. My review focused on the testimony of Company witness Boyd who sponsors AEP Ohio's proposed Enhanced Service Reliability Plan. In addition, I have reviewed documents related to the Self-Complaint of CSP and OPC regarding the Implementation of Programs to Enhance Distribution Reliability as

well as the testimony of OCC witness Peter J. Lanzalotta, Case No. 06-222-EL-SLF.[1] I have also reviewed documents from Case No. 03-2570-EL-UNC[2] including the May 2003 Staff Report and Stipulation and AEP Ohio's Final Report. Finally, I have reviewed the proposed revisions to the Electric Service and Safety Standards ("ESSS") Rules in Case No. 06-653-EL-ORD, which is currently before the Public Utilities Commission of Ohio ("PUCO" or "Commission").

Q12. WHAT ARE YOUR RECOMMENDATIONS CONCERNING THE COMPANY'S PROPOSED ESRP?

A12. I recommend that the Commission rule that AEP Ohio's proposed ESRP consists of routine distribution reliability matters and should not be approved as part of the Company's ESP. AEP Ohio has not shown that the additional investment it has proposed as part of its ESRP will noticeably enhance distribution system reliability.

Based on my review of the Company's ESRP, I have the following additional recommendations:

I recommend that the Commission require a minimum data retention period of five years which is needed in order to have a reasonable chance of correlating the

[1] *In the Matter of the Self-Complaint of Columbus Southern Power Company and Ohio Power Company Concerning the Implementation of Programs to Enhance Their Currently Reasonable Level of Distribution Service Reliability.* Case No. 06-222-EL-SLF ("06-222").

[2] *In the Matter of the Settlement Agreement Between the Staff of the Public Utilities Commission of Ohio and Columbus Southern Power Company and Ohio Power Company.* Case No. 03-2570-EL-UNC ("03-2570").

level of distribution system electric service reliability that results from specific planning, maintenance, or operating policies.

I recommend that the Commission rule that the Company's proposed Vegetation Management Programs, while an improvement over its current performance based program, is not an enhancement but rather a reflection of additional tree trimming needed as a result of their prior program.

Additionally, the Company's vegetation management plan should include provisions to manage (i.e., trim or remove) trees outside of the right-of-way.

I recommend that the Commission rule that AEP Ohio's proposed Overhead Circuit Inspection and Mitigation Initiative is not truly enhanced but rather that AEP Ohio should now begin following good industry practice as required by Rule 27 of the ESSS – which it should have been doing in the normal course of business.

I recommend that the Commission rule that the programs proposed by AEP Ohio such as accelerated replacement of defective equipment and hardware are not enhancements but rather the Company is just following good industry practices. As I discuss in my testimony, the Company is characterizing as an "enhancement" maintenance activities that it should have been conducting as business-as-usual.

I recommend that the Commission rule the Company's proposed Underground Mitigation Programs is not an enhanced program but rather a part of normal utility system maintenance. The Commission should also require AEP Ohio to provide data to show how much improvement in service reliability will result from investing in such an expensive program.

I recommend that the Commission rule that the Company should focus first on the installation of SCADA capability throughout its distribution system before considering the deployment of Distribution Automation.

Q13. WOULD YOU PLEASE SUMMARIZE YOUR FINDINGS AND CONCLUSIONS?

A13. Based on my review, my findings are as follows:

1. System reliability index performance, with major storm data included, has become increasingly less reliable and more divergent from reliability indices with storm data excluded, especially in 2003 and 2004.
2. AEP Ohio's current vegetation management program is described as performance-based, and I believe this has contributed to the deterioration in the Company's reliability index performance, especially during major storms.
3. An aggressive program to deal with trees outside the right-of-way needs to be specified and made part of the vegetation management effort.
4. The enhanced overhead line inspection program does not appear to be significantly different from the Company's existing program.

5. Parts of the Company's overhead mitigation program appear to represent incremental efforts that address significant reliability concerns regarding fuse cutouts and lightning arrestors that have been demonstrating increasing failure rates. This 34.5 kV program, however, while laudable, does not reflect an incremental effort.
6. The parts of the enhanced reliability programs that deal with the replacement of aging equipment should not be considered as incremental to normal utility practice.
7. The installation of Supervisory Control and Data Acquisition ("SCADA") capability in those substations which do not currently have it should take precedence over more sophisticated distribution automation efforts.
8. The Plan is deficient in several areas addressing implementation details, expected reliability benefits, formalized reporting, and regulatory review.

Q14. AS CONTEMPLATED BY SB 221, DOES THE COMPANY'S ESRP INCLUDE PROVISIONS FOR ALTERNATIVE REGULATION MECHANISMS OR PROGRAMS, INCLUDING INFRASTRUCTURE AND MODERNIZATION INCENTIVES, RELATING TO DISTRIBUTION SERVICE AS PART OF ITS ESP?

A14. AEP Ohio's ESRP does provide for distribution modernization as contemplated by the statute. However, it is not structured as an "incentive plan" because the requested revenue increase is not dependent upon the Company's reliability

performance. In fact, there is no penalty for the Company's failure to meet any reliability targets as a result of the implementation of the ESRP.

Q15. AS CONTEMPLATED BY SB 221 FOR DELIVERY INFRASTRUCTURE MODERNIZATION PLANS, DOES THE COMPANY'S ESRP PROVIDE FOR EACH SPECIFIC MECHANISM OR PROGRAM A DETAILED DESCRIPTION, WITH SUPPORTING DATA AND INFORMATION, TO ALLOW APPROPRIATE EVALUATION OF EACH PROPOSAL, INCLUDING HOW THE PROPOSAL ADDRESSES COST SAVINGS TO THE ELECTRIC UTILITY, AVOIDS DUPLICATIVE COST RECOVERY, AND ALIGNS AEP OHIO'S AND THEIR CUSTOMERS INTERESTS?

A15. AEP Ohio's proposed ESRP provides no information regarding cost savings to the utility nor does it address the avoidance of duplicative cost recovery. The "alignment" of the AEP Ohio and consumer interests though the ESRP is flawed because the application and testimony merely attempt to measure whether customers expect reliability service. There is no provision in the ESRP for a review of the expenditures and what to do about funds allocated for various reliability programs that are not spent.

III. DISTRIBUTION ELECTRIC SERVICE: SAFETY STANDARDS AND RULES AND COMMONLY USED RELIABILITY MEASUREMENTS

A. Commonly Used Reliability Measurements

Q16. HOW IS THE RELIABILITY OF AN ELECTRIC UTILITY'S DISTRIBUTION SERVICE TYPICALLY MEASURED?

A16. Although there are a number of different ways to measure electric distribution service reliability performance, the reliability indices SAIFI, CAIDI, and SAIDI are among the most widely used.

SAIFI refers to the System Average Interruption Frequency Index, and is calculated by dividing the total number of sustained customer service interruptions by the total number of customers served. For a calendar year period, SAIFI represents the average number of sustained electric service outages per customer served during that period. SAIFI may be calculated for time periods other than a calendar year as well.

CAIDI refers to the Customer Average Interruption Duration Index, and is calculated by dividing the sum of the individual customers' minutes of sustained electric service interruption by the total number of individual customer interruptions. For a calendar year period, CAIDI represents the average number of minutes of electric service interruption for each customer service interruption, or, put another way, the average outage duration. CAIDI may be calculated for

time periods other than a calendar year as well, and is sometimes calculated in hours, rather than in minutes.

SAIDI refers to the System Average Interruption Duration Index, and is calculated by dividing the sum of the individual customers' minutes of sustained electric service interruption by the total number of customers served. SAIDI can also be calculated by multiplying SAIFI times CAIDI. For a calendar year period, SAIDI represents the average number of minutes of electric service interruption for each customer served. SAIDI may be calculated for time periods other than a calendar year as well, and is sometimes calculated in hours, rather than in minutes.

For all of these reliability performance indices, a lower value reflects more reliable performance, while a higher value reflects less reliable performance. For example, for CAIDI, which measures the average duration of outages, a value of 100 would mean 100 minutes of outage time, while a value of 140 would mean 140 minutes of outage time – a longer period of time without electricity.

1 *Q17. SHOULD MAJOR STORMS BE CONSIDERED WHEN ANALYZING*

2 *DISTRIBUTION SERVICE RELIABILTY?*

3 *A17.* Yes. ESSS Rule 10(B)(3) provides that outage data for service interruptions that

4 occur during major storms[3], and outage data for service interruptions caused by

5 outages of transmission facilities should not be included in the calculation of

6 reliability performance indices or used in the determination of index performance

7 targets.

8

9 While there are justifications for using outage data that has been stripped of

10 customer outages that occur during especially bad weather[4] (or for using outages

11 data stripped of customer outages resulting from transmission system events[5]),

12 there is a good reason for also calculating a set of reliability indices with customer

13 outages that include major storms.

14

15 Including major storm service interruptions in the calculation of one set of

16 reliability indices reflects what the customer is actually seeing in the way of

17 distribution service reliability. If a purpose of looking at reliability index

18 calculations is to promote the provision of reliable electric service to customers,

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[3] Major Storms are storms in which the restoration of electric service takes more than 24 hours and in which assistance from another district is required. See Attachment DWC-1.

[4] Because the effects of bad weather on distribution system reliability typically vary from year to year, removing the customer outages resulting from bad weather from the calculation of the reliability indices attempts to make year-to-year reliability indices more reflective of the reliability inherent in the system and less reflective of variations in weather.

[5] Removal of customer outages resulting from transmission system interruptions from the calculation of reliability indices results in reliability indices that focus on distribution system performance. Since most customer outages typically result from distribution system events, this focus is useful.

then reliability index calculations that include major storm-related outages that customers are experiencing should be available. The removal of major storm-related customer outages from all reliability indices can obscure changes in the distribution system's ability to provide reliable service during bad weather. If major storm-related customer outages carry lesser weight in evaluating distribution system reliability performance than outages that are not storm-related, then EDU's will have less incentive to design and/or maintain their distribution systems so as to maintain or to increase their ability to withstand storm-related events. For example, the windstorms that moved through Ohio on September 14, 2008, which left hundreds of thousands of AEP Ohio customers without power for an extended period of time, accentuates the need for the Company to keep current in its distribution maintenance activities.

For these reasons, it is reasonable and appropriate for the Commission to require AEP Ohio to calculate a set of reliability index data (SAIFI, CAIDI, SAIDI) for each of its companies reflecting all distribution-related outages without exclusions.

IV. HISTORY OF AEP OHIO'S DISTRIBUTION SERVICE RELIABILITY

A. Case No. 03-2570-EL-COI

Q18. WHAT ARE THE EVENTS THAT HAVE LED AEP OHIO TO INCLUDE AN EVALUATION OF ITS ELECTRIC DISTRIBUTION SERVICE RELIABILITY IN AEP OHIO'S ESP APPLICATION?

A18. In early 2003, concerns about the reliability of the distribution service being provided by CSP and OPC caused the Commission staff to look more closely at the Company's policies, practices, and recordkeeping as they related to inspecting, maintaining, and operating its distribution systems. The result was a May 1, 2003 report titled "Staff Concerns and Recommendations About Columbus Southern Power Company and Ohio Power Company's Provision of Electric Service" ("2003 Staff Report").

The 2003 Staff Report addressed concerns resulting from (1) rural distribution circuits that were among the Company's worst performing circuits from one year to the next, (2) reductions in distribution-related capital and maintenance expenditures, and (3) increases in service-related complaints from the Company's customers. The 2003 Staff Report also discussed a number of topics related to outage mitigation, including tree-trimming, wind-related outages, animal-related outages, system deterioration, equipment inspections and maintenance, and other topics related to the Company's electric service distribution system reliability. The 2003 Staff Report expressed the opinion that the Company appeared to not be

complying with certain ESSS rules and made a number of recommendations, which if implemented, could improve the Company's reliability performance.

Negotiations between the Commission staff and the Company during 2003 resulted in the December 31, 2003 Stipulation and Settlement Agreement ("Stipulation"), in which the Company agreed, among other things, to improve by 40% the 2002 reliability performance of the worst performing 25% (the 1st quartile) of its distribution circuits in Ohio over the two years following the Stipulation, without letting reliability performance of the rest of the distribution circuits decline.[6]

B. Case No. 06-222-EL-SLF

Q19. WHAT WERE THE RESULTS OF AEP OHIO'S FINAL REPORT AND SELF COMPLAINT FILED ON JANUARY 31, 2006?

A19. On January 31, 2006 AEP Ohio filed a Self Complaint that was intended to focus the Commission on the future direction of service reliability. AEP Ohio pointed out that some of the factors impacting SAIDI were controllable by the Companies at some incremental cost. AEP Ohio requested that the Commission implement a proceeding in which an enhanced reliability program, as proposed by AEP Ohio, would be reviewed and authorized by the Commission.

[6] Stipulation and Settlement Agreement dated December 31, 2003 in 03-2570.

1 AEP Ohio also filed a "Year Two" final report which described the Company's
2 progress toward meeting the improved reliability required in the Stipulation. AEP
3 Ohio's final report showed that the system average interruption duration index
4 (SAIDI) target for the first quartile of 279.2 minutes of annual outages per
5 customer was met and exceeded at the end of 2005 with a SAIDI of 258.7
6 minutes. However, AEP Ohio reported that the 2002 baseline SAIDI was not
7 maintained for the remaining three quartiles of distribution circuits. AEP Ohio
8 described unforeseen and uncontrollable events that the Company believed
9 contributed to its inability to meet the baseline SAIDI. According to AEP Ohio
10 these events included an increase in the failure rate of distribution line equipment,
11 an increase in the number of distribution station outages, and uncontrollable
12 events such as vehicle accidents and the mutual assistance needs of other electric
13 utilities.
14
15 ***Q20. WHAT WERE THE RESULTS OF THE STAFF INVESTIGATIVE REPORT***
16 ***OF APRIL 17, 2006?***
17 ***A20.*** On April 17, 2006, Commission staff filed a report setting forth its findings and
18 recommendations for improving AEP Ohio's distribution service reliability
19 ("2006 Staff Report"). In its report, Commission staff analyzed the drivers of the
20 Company's reliability performance. Commission staff felt that the Company's
21 distribution system was in need of a resource intensive plan for replacement of
22 aging underground and overhead infrastructure. Commission staff found that
23 over the past five years, AEP Ohio's system-wide reliability performance had

been getting worse on all measures, even after efforts made to improve reliability during the stipulation period. Commission staff recommended that the Commission separate the consideration of the issues into two separate dockets: the 03-2570-EL-UNC docket should focus solely on the consequences of the Companies' failure to comply with the Stipulation as approved by the Comission and the 06-222-EL-SLF docket should address the reliability concerns of the future. Commission staff recommended that the comprehensive plans to address future reliability should address the replacement of aging system infrastructure, vegetation management, mitigation of lightning-caused faults, improved fault cause identification, reduction of errors, and improved outage restoration times.

Q21. DID AEP OHIO FILE A PROPOSED ENHANCED DISTRIBUTION SERVICE RELIABILITY PLAN IN THE 06-222 CASE?

A21. Yes. The Company filed its Enhanced Distribution Service Reliability Plan ("06-222 Plan") on October 6, 2006 in response to the Commission's July 26th Order for the Company to submit a proposed reliability plan. The 06-222 Plan reviewed selected parts of what the Company called base distribution reliability programs, and included a distribution pole inspection program, overhead circuit inspection programs, pad-mounted transformer programs, line recloser programs, line capacitor programs, the network system maintenance program, the distribution vegetation management program, and the distribution substation reliability programs.

1 The 06-222 Plan also described an "incremental" distribution reliability plan.
2 This incremental plan was touted as the means by which the Company would
3 reach the next level of reliability, by focusing on initiatives to address the
4 Company's aging infrastructure and customers' demand for increased quality of
5 service. The incremental distribution reliability plan expanded on the Company's
6 base distribution reliability programs, added incremental reliability programs, and
7 provided for increased funding by ratepayers of the Company's reliability-related
8 programs.
9
10 **C. AEP Ohio's Historical Distribution Service Reliability Performance**
11 *Q22. WHAT HAS THE COMPANY'S RELIABILITY PERFORMANCE BEEN*
12 *LIKE IN RECENT YEARS?*
13 *A22.* Table 1 below depicts reliability index data by year for the CSP and OPC
14 distribution systems as reported in response to ESSS Rule 10.

Table 1

AEP Ohio Reliability Indices (major storms excluded)						
	CSP			Ohio Power		
	SAIFI	CAIDI	SAIDI	SAIFI	CAIDI	SAIDI
1998	1.200	120.0	138.0	1.000	198.0	198.0
1999	1.399	121.8	170.4	0.914	142.2	130.0
2000	1.572	141.6	222.6	0.918	160.2	147.1
2001	1.474	120.4	177.5	1.240	140.1	173.7
2002	1.620	122.8	198.9	1.345	167.4	225.1
2003	1.905	123.6	235.5	1.415	151.5	214.3
2004	1.861	116.8	217.4	1.451	144.4	209.5
2005	1.894	130.7	247.6	1.511	146.7	221.7
2006	1.470	113.8	166.8	1.410	137.6	194.7
2007	1.670	118.6	198.0	1.330	131.3	174.7
Avg. 1998-2001	1.411	125.95	177.13	1.018	160.13	162.20
Avg. 2002-2007	1.737	121.06	192.35	1.410	146.49	206.67
Percent Change	23.06%	-3.88%	8.60%	38.54%	-8.52%	27.42%

Source: Data for 1998-2005 from Lanzalotta Direct testimony in 06-222. Data for 2006 and 2007 from OCC Interrogatory Request No. 3-34 (Attachment DWC-2).

The SAIFI data in Table 1 reflects the number of electric service outages per year experienced by the average customer. The CAIDI data reflects the length of the average customer outage, in minutes. The SAIDI data reflects the total number of minutes of electric service outages experienced by the average customer per year. As can be seen above, reliability performance, prior to 2007, had declined in several important respects starting around 2001 (as noted earlier, higher index values mean lower electric service reliability). This decline in performance is reflected by an increase in SAIFI index values (more customer outages per year)

and in SAIDI index values (more minutes of outages per customer per year) for both CSP and OPC.

Of course, the reliability index data in Table 1 does not really reflect the electric service reliability being experienced by AEP Ohio's customers, since it excludes all electric service outages that occur during major storms. Because storm activity is typically not constant from one year to the next, removing storm impacts from reliability data de-emphasizes the more variable reliability effects of storms. However, this approach loses touch with what electric service customers are actually experiencing, and, at best, can actually encourage maintenance and operating practices that tend to ignore the reliability impacts suffered during storms, and, at worst, can actually increase the reliability impacts suffered during major events such as storms which result in widespread outages.

Table 2 below reflects the same reliability indices as in Table 1, only these indices include electric service interruptions experienced by customers during major storms.

Table 2

AEP Ohio Reliability Indices (major storms included)						
	CSP			Ohio Power		
	SAIFI	CAIDI	SAIDI	SAIFI	CAIDI	SAIDI
1998	1.264	121.2	153.2	1.066	228.0	243.1
1999	1.439	118.5	170.6	0.973	134.1	130.5
2000	1.678	132.9	223.1	1.051	141.1	148.3
2001	1.485	119.5	177.5	1.380	126.5	174.6
2002	1.779	148.7	264.5	1.643	231.3	380.1
2003	2.506	347.9	871.8	2.068	431.2	891.6
2004	2.759	652.7	1801.0	2.126	466.0	990.7
2005	2.130	141.1	300.4	1.880	369.2	694.4
2006	1.690	141.7	239.0	1.850	310.4	574.6
2007	1.700	121.9	206.7	1.460	157.2	229.8
Avg. 1998-2001	1.467	123.03	181.10	1.118	157.43	174.13
Avg. 2002-2007	2.094	258.99	613.91	1.838	327.54	626.88
Percent Change	42.79%	110.52%	238.99%	64.46%	108.06%	260.02%

Source: Data for 1998-2005 from Lanzalotta Direct Testimony at page 17 in 06-222. Data for 2006 and 2007 from ESSS Rule 10 Reports (Attachment DWC-3).

As shown in the last three lines of Table 2, looking at the average electric service outage frequency (SAIFI) with storm outages included the average CSP customer saw an average of 2.1 service interruptions per year from 2002 to 2007, compared to an average of 1.467 service interruptions per year for the four years before that (an increase of 42.8%). The average OPC customer saw an increase in average annual service interruptions to 1.84 interruptions per year from 1.118 interruptions per year over the same period (an increase of 64.5%).

Similarly, looking at the average annual minutes of service interruptions per customer (SAIDI) with storm outages included the average CSP customer saw an average of about 614 minutes of service interruptions per year from 2002 to 2007, compared to an average of about 181 minutes of service interruptions per year for the four years before that (an increase of 239%). The average OPC customer saw an increase in the average annual minutes of service interruptions to about 627 minutes per year from 174 minutes per year over the same period (an increase of 260%). The average duration of each Company's electric service interruption (CAIDI) also increased substantially over the same time periods when outages occurring during major storms are included, although by less than for SAIDI.

It is also useful to note, comparing data from Table 2 to Table 1, that there is relatively little difference between the average reliability indices for the period 1998 to 2001 regardless of whether storm-related outages are included or not. By way of contrast, there are large percent increases in the number of interruptions experienced and their duration during 2002-2007 when storm related outages are included in the reliability indices. While the level of storm activity may have varied before and after January 1, 2002, based on the increases in outage duration reflected in Table 2, the ability of the Company to deal effectively with storms seems to have weakened significantly over the same period.

1 ***Q23. WHAT HAVE BEEN THE LEADING CAUSES OF OUTAGES ON THE***

2 ***COMPANY'S SYSTEMS?***

3 *A23.* Company witness Boyd (at page 16) states that the Company's leading outage

4 causes in recent years are equipment failure, trees inside the right-of-way, trees

5 outside the right-of-way, and other specific factors that have the greatest negative

6 impact on service reliability. In addition, Company witness Boyd states on page

7 22 of his testimony that the top five causes under the category of equipment

8 failure since 2004 are cutouts, underground conductor, overhead conductor,

9 arresters, and insulators.

10

11 ***Q24. WHAT OTHER ISSUES HAVE YOU IDENTIFIED WITH THE***

12 ***COMPANY'S DISTRIBUTION RELIABILITY AND OUTAGE REPORTING?***

13 *A24.* I have identified two additional areas that should be addressed. The first is AEP

14 Ohio's failure to meet its reliability performance targets and the second is AEP

15 Ohio's data retention period.

16

17 One reliability index required in ESSS Rule 10 is to compare the EDU's system

18 reliability indices for a period of time, typically one year, against performance

19 targets. Rule 10 specifies that these performance targets should reflect historical

20 performance, along with other factors. Table 3 below shows AEP Ohio's targets

21 for SAIFI, CAIDI, and SAIFI from 1998 – 2007.

Table 3

	CSP				Ohio Power		
	SAIFI	CAIDI	SAIDI		SAIFI	CAIDI	SAIDI
1998	1.000	144.0	138.0		1.000	168.0	150.0
1999	1.000	144.0	138.0		1.000	168.0	150.0
2000	1.291	161.2	163.5		1.019	215.6	218.6
2001	1.291	161.2	163.5		1.019	215.6	218.6
2002	1.291	161.2	163.5		1.019	215.6	218.6
2003	1.291	161.2	163.5		1.019	215.6	218.6
2004	1.291	161.2	163.5		1.019	215.6	218.6
2005	1.291	161.2	163.5		1.019	215.6	218.6
2006	1.29	161.2	163.5		1.02	215.6	218.6
2007	1.29	161.2	163.5		1.02	215.6	218.6

Source: Data for 1998-2005 from Lanzalotta Direct testimony at page 28 in 06-222. Data for 2006 and 2007 from OCC Interrogatory Request No. 3-34 (Attachment DWC-2).

As can be seen by Table 3, AEP Ohio has set and reset lower reliability targets. This trend should be a part of the analysis of AEP Ohio's reliability in this case.

4901:1-10-03 Retention of records ("ESSS Rule 03") requires that, unless otherwise specified, records sufficient to demonstrate compliance with the Rules shall be maintained for three years. However, in areas regarding distribution system planning, maintenance and operation, retention of data for only three years is really too short a period to be sufficient for reliability purposes. Without more than three years of information, the ability to correlate the level of maintenance and design that lead to poor reliability performance, and, therefore, to contrast it with what was done to improve reliability performance is lost.

1 *Q25. WHAT IS YOUR RECOMMENDATION CONCERNING THE COMPANY'S*
2 *DATA RETENTION PERIOD AS IT RELATES TO THEIR ESRP?*
3 *A25.* I recommend that the Commission require a minimum data retention period of
4 five years which is needed in order to have a reasonable chance of correlating the
5 level of distribution system electric service reliability that results from the
6 Company's specific planning, maintenance, or operating policies which result
7 from their proposed ESRP. It should be noted that full implementation of the
8 ESRP as proposed by the Company is five years.
9
10 **V. AEP OHIO'S EHANCED SERVICE RELIABILITY PLAN**
11
12 *Q26. HAS AEP OHIO SUBMITTED AN ENHANCED SERVICE RELIABLITY*
13 *PLAN AS PART OF ITS ESP APPLICATION?*
14 *A26.* Yes. According to page 17 of Mr. Boyd's testimony, the primary focus of the
15 ESRP is to enhance and modernize AEP Ohio's energy delivery infrastructure to
16 meet customers' increasing reliability expectations. He further asserts that the
17 ESRP focuses on the leading outage causes (both momentary and sustained) to
18 significantly enhance the overall "customer experience."
19 The enhanced portion of the ESRP describes what amounts to an incremental
20 distribution reliability plan, which is touted as the means by which the Company
21 can reach the next level of reliability, by focusing on initiatives to address the
22 Company's aging infrastructure and customers' demand for increased quality of
23 service. The ESRP expands on the Company's base distribution reliability

1 programs, adds incremental reliability programs, and provides for increased
2 funding by ratepayers for the Company's reliability-related programs.
3
4 *Q27. HOW HAS AEP OHIO STRUCTURED ITS ENHANCED SERVICE*
5 *RELIABILITY PLAN?*
6 *A27.* The programs contained in AEP Ohio's ESRP can be divided into two
7 components: current and enhanced reliability practices and initiatives. The
8 current distribution-related practices may be divided into three major categories:
9 1) Six ongoing Distribution Asset Management Programs;[7] 2) Major Distribution
10 Reliability Improvements and Capacity Additions;[8] and, 3) Distribution
11 Vegetation Management Program.[9]
12
13 The portion of the ESRP that AEP Ohio claims as enhanced programs consists of
14 vegetation management (right-of-way clearing); overhead line inspection;
15 distribution automation; and underground residential distribution cable
16 replacement and rejuvenation.[10]
17

[7] See Company Witness Boyd's Direct testimony at page 5. The six programs are: Overhead Circuit Facilities Inspection and Maintenance Program; Pole Inspection and Maintenance Program; Pad-Mount Transformer Program; Recloser Maintenance/Replacement Program; Line Capacitor Program and Network System Program.

[8] See Company Witness Boyd's Direct testimony at pages 6-7. According to Mr. Boyd, these programs involve various major distribution reliability improvements and capacity additions that are not included in the more routine Distribution Asset Management Programs.

[9] See Company Witness Boyd's Direct testimony at pages 7-8. According to Mr. Boyd, the Company's vegetation management program is a comprehensive, integrated program that employs a variety of practices such as mechanized trimming including aerial sawing; manual trimming including roping and hand climbing; brush mowing and herbicide applications.

[10] See Company Witness Boyd's Direct testimony at page 17.

My testimony that follows discusses the Company's current reliability practices, its proposed enhanced reliability initiatives and my recommendations.

Q28. WHAT IS THE RESULT OF YOUR ANALYSIS OF AEP OHIO'S ERSP?

A28. AEP Ohio has not demonstrated how it's incremental or "enhanced" programs go beyond what it should be doing on a normal basis. For example, as I discuss later in my testimony, the Company's overhead line inspection approach as described by Company witness Boyd may improve service reliability but is a program that the Company should have been performing in the normal course of business. A program that allows the Company to "catch-up" because its reliability programs were inadequate are not "enhancements."

A. Distribution vegetation management program – current and enhanced

Q29. FROM A HISTORICAL PERSPECTIVE, HAS THE COMPANY EXPERIENCED ANY PROBLEMS WITH THEIR VEGETATION MANAGEMENT PROGRAM?

A29. Vegetation management has been one of the more problematic areas of the Company's distribution maintenance programs. In the early 2000s, the Company's filed distribution system vegetation management policy reflected total circuit trimming on a four-to-six year cycle, with additional off-cycle clearing to deal with problem areas prior to the next total trim. The 2003 Staff Report

found[11] that the Company was using hot-spot trimming (isolated trimming in response to tree-caused outages) and postponing tree trimming on a circuit until reliability performance on that circuit deteriorates to the worst 15% of circuits due to tree-related service interruptions, and that these policies were being substituted for the four-to-six year cycle for the complete trimming of each circuit. Staff believed that use of these policies without having been reported under ESSS Rule 27 were unauthorized and in violation of ESSS Rule 27 (E)(2)(c).

In 06-222, AEP Ohio described its vegetation management program as "performance-based" which prioritizes work on distribution facilities based on a number of variables, including the elapsed time since the last vegetation management activities were performed on the facility, inspection results, tree-related reliability performance, and other factors.[12]

Q30. IS THE USE OF PERFORMANCE-BASED VEGETATION MANAGEMENT TYPICAL AMONG ELECTRIC UTILITIES?

A30. The use of "performance-based" direction of at least some vegetation management activities is on the increase among electric utilities. It may take the form of something as simple as annual listings of a utility's worst performing distribution circuits, with these circuits targeted for remedial action that frequently includes tree trimming. However, many utilities still use an overall

[11] 2003 Staff Report at 8.

[12] 06-222 Plan at 15.

comprehensive trimming cycle or other application of vegetation management techniques, every so many years.

The use of a vegetation management policy that rations tree trimming and other vegetation management activities only to those distribution circuits that exhibit especially poor electric service reliability due to tree-related faults probably comes at a cost to overall system reliability. Minimizing tree trimming in this way leaves a lot of vegetation in close proximity to circuits, which also tends to increase the tree-related problems that occur during storms. The Company's recent reliability index performance during storms certainly suggests that increased storm response and service restoration capabilities should be part of its performance-based program of vegetation management (if the Company continues to use performance-based programs).

Q31. WHAT ARE THE PROVISIONS IN THE COMPANY'S ENHANCED SERVICE RELIABLITY PLAN FOR VEGETATION MANAGEMENT?

A31. Mr. Boyd describes AEP Ohio's Vegetation Management Programs on page 8 of his testimony as a "performance-based" approach, which prioritizes work on their facilities after taking into consideration a number of input variables. These variables include elapsed time since the last trimming, results of line inspections, tree-related performance, the needs of critical customers, customer experiences, and environmental conditions.

1 Regarding vegetation management, Company witness Boyd states on page 27 of
2 his testimony that AEP Ohio plans to balance its current performance-based
3 approach to reflect a greater consideration of cycle-based factors. The Company
4 indicates that it will take five years to fully implement its' enhanced vegetation
5 plan. Once fully implemented, the Companies commit to inspecting or
6 maintaining all of its distribution rights-of-way on a four-year cycle. During the
7 initial three year period of the enhanced plan, the Company would employ the use
8 of improved technology to collect, store, predict and analyze specific vegetation
9 data. During this period, the Company would inventory tree species' growth rates
10 to create detailed work plans for each circuit to annually predict and schedule
11 maintenance cycles as needed. Other factors that would be considered are the
12 location of vegetation in proximity to the conductors, accessibility, density, and
13 vegetation coverage.
14
15 AEP Ohio proposes significant increases in its vegetation management funding
16 which would essentially double the current number of tree crews in Ohio
17 available to perform end-to-end clearing on all of its distribution lines. On page
18 31 of his testimony, Mr. Boyd states that once the distribution system has been
19 totally cleared and inventoried, the Company expects the number of tree crews to
20 decrease. Mr. Boyd states that the Company's increased spending over the period
21 2004-2005 has led to a 62 percent reduction in outages associated with trees
22 within rights-of-way.
23

1 *Q32. WHAT ARE THE PROVISIONS IN THE COMPANY'S PLAN TO ADDRESS*
2 *RELIABILITY PROBLEMS CAUSED BY TREES LOCATED OUTSIDE THE*
3 *DISTRIBUTION RIGHT-OF-WAY?*
4 *A32.* The Company's vegetation management proposal does not appear to address the
5 interruption caused by trees located outside the distribution right-of-way. Such
6 trees represent a special problem, as a utility's right to trim trees located outside
7 the right-of-way is usually limited and frequently requires permission from
8 property owners.[13] Additionally, outages caused by such trees are listed by the
9 Company as one of the five leading causes of customer interruptions, as noted
10 earlier in my testimony.
11
12 Programs to try to deal with the most threatening trees located outside the right-
13 of-way are an increasingly common part of vegetation management plans. Such
14 programs typically take note of trees near the right-of-way whose limbs and trunk
15 could pose a danger to the distribution circuit if they were broken and fell to the
16 ground. If these pose an imminent threat to the line, such as if they are dead, or if
17 they overhang the line, they are typically removed for safety considerations.
18 Otherwise, permission to remove the tree from property owners is sometimes
19 required and is actively pursued. The Company's vegetation management plan
20 should include provisions to address these problem trees.
21

[13] The trimming of limbs that extend into the right-of-way are typically not restricted in this way.

1 *Q33. WHAT ARE YOUR RECOMMENDATIONS CONCERNING THE*
2 *COMPANY'S PROPOSED ENHANCED VEGETATION MANAGEMENT*
3 *PROGRAM AND TREES OUTSIDE OF THE RIGHT-OF-WAY?*
4 *A33.* AEP Ohio's proposal to adopt a hybrid approach by moving toward a cycle-based
5 tree trimming program while retaining some performance-based criteria appears
6 to be an improvement over its current program. However, the need to employ a
7 five-year crash program in vegetation management is to some degree an
8 admission that the Company's performance-based program of vegetation
9 management has allowed the vegetation situation on the distribution system to get
10 out of control in recent years. The deteriorating reliability index performance of
11 the distribution system in stormy weather supports this.
12
13 In addition, if the Company needs to double the current vegetation management
14 capability in order to fully inspect and/or trim each of its distribution feeders once
15 over the next four years, this certainly suggests that current capabilities have been
16 allowed to atrophy to a level far short of what is needed to maintain system
17 reliability.
18
19 I recommend that the Commission rule that the Company's proposed Vegetation
20 Management Programs, while an improvement over its current performance based
21 program, is not an enhancement but rather a reflection of additional tree trimming
22 needed as a result of their prior program.
23

Additionally, the Company's vegetation management plan should include provisions to manage (i.e., trim or remove) trees outside of the right-of-way.

B. Distribution asset management programs

Q34. WHAT ARE THE CURRENT DISTRIBUTION-RELATED PRACTICES ASSOCIATED WITH AEP OHIO'S DISTRIBUTION ASSET MANAGEMENT PROGRAMS?

A34. The ESRP first reviews selected parts of what are essentially the Company's base distribution reliability programs. These programs are currently in effect and include such items as the Pole Inspection and Maintenance Program, the Overhead Circuit Facilities Inspection Program, and other routine inspection programs.

i. Overhead Circuit Facilities Inspection and Maintenance Program

Q35. WHAT ARE THE PROVISIONS OF THE COMPANY'S CURRENT OVERHEAD CIRCUIT FACILITIES INSPECTION AND MAINTENANCE PROGRAM?

A35. As mandated by ESSS Rule 27, AEP Ohio conducts overhead distribution circuit inspections on a five-year cycle. Company witness Boyd (at page 5) states that AEP Ohio visually inspects its overhead facilities to identify and correct deficiencies before they cause service interruptions.

1 *Q36. WHAT ARE THE PROVISIONS OF THE COMPANY'S ENHANCED*

2 *OVERHEAD INSPECTION AND MITIGATION INITIATIVE?*

3 *A36.* Company witness Boyd (at page 18) proposes to maintain overhead line

4 inspections on the current five-year cycle, but to increase the comprehensiveness

5 and attention to detail in the inspections. The Company suggests that current

6 overhead distribution line inspections are more of a "drive-by" nature.[14] Under

7 the incremental plan, circuits would be walked, or perhaps inspected more closely

8 by climbing structures or by using a bucket truck to inspect hardware and

9 equipment. Infrared scanning or radio frequency detection devices would also be

10 used.

11

12 *Q37. WHAT ARE YOUR CONCLUSIONS AND RECOMMENDATIONS*

13 *REGARDING THE OVERHEAD CIRCUIT INSPECTION AND*

14 *MITIGATION INITIATIVE?*

15 *A37.* It is not at all clear that there are significant differences between what the

16 Company proposes and what the Company is supposed to be doing currently in

17 conducting overhead circuit inspections. In the 06-222 case, OCC filed testimony

18 by Peter Lanzalotta who stated

19 > It is not clear that personnel currently performing these inspections
20 > perform them while driving down the road. (In his deposition, AEP Ohio
21 > employee Karlen Cooper stated that these inspections have always been
22 > performed by walking the circuit.) If performed from a parked vehicle, it
23 > is not clear that such inspections are inferior to performing an inspection
24 > while standing up, as long as the circuit is in close proximity. For circuits
25 > that do not follow roads, there is no way to perform such inspections at
26 > present, short of walking the circuit, or, perhaps flying it. And under

[14] Boyd Direct testimony at 19.

> current practice, if an inspection shows problems on an overhead circuit, repairs are called for under the ESSS Rule 27 procedures AEP Ohio has filed. (Footnote cite omitted)

The Company lists categories of repair and replacement work that might result from these inspections. According to page 19 of Mr. Boyd's testimony, ensuing mitigation work would range from no action to full structure, hardware and equipment replacement. None of these categories appear to reflect anything that utilities do not already do in response to inspections of overhead distribution facilities. In other words, AEP Ohio is just now proposing – as an "enhancement" to its current practices – the type of inspections that are current practice or business as usual for other electric companies.

I recommend that the Commission rule that AEP Ohio's proposed Overhead Circuit Inspection and Mitigation Initiative is not truly enhanced but rather that AEP Ohio should now begin following good industry practice as required by Rule 27 of the ESSS – which it should have been doing in the normal course of business.....

ii. Overhead Facilities – Targeted Initiatives

Q38. WHAT OTHER ROUTINE INSPECTION PROGRAMS HAS THE COMPANY IMPLEMENTED FOR OVERHEAD FACILITIES?

A38. The Company routinely makes a visual inspection of pad-mount transformers, reclosers, line capacitors, and their network system. In addition to the visual

1 inspection, the Companies perform in-service testing of reclosers and capacitors
2 and well as perform corrective maintenance.
3
4 According to Mr. Boyd's testimony on page 7, each year the Company completes
5 extensive improvements to their distribution system that are over and above the
6 more routine Distribution Asset Programs previously described. Mr. Boyd asserts
7 that AEP Ohio completes extensive improvements to prevent overloading on
8 equipment, balance loads and voltage, enhance protection schemes, and improve
9 its ability to restore power to customers on a timely basis.
10
11 ***Q39. WHAT TARGETED INITIATIVES FOR OVERHEAD ASSETS ARE***
12 ***CONTAINED IN THE ENHANCED SERVICE RELIABILITY PLAN?***
13 *A39.* The Company is proposing to proactively focus on targeted assets, including
14 replacing cracked cutouts, replacing faulty and obsolete lightning arresters, a
15 recloser replacement program, an incremental 34.5 kV protection program, and an
16 incremental fault indicator program. Company witness Boyd states that these
17 assets are targeted because they represent the five leading causes of equipment
18 failures on distribution lines since 2004.[15]
19

[15] Boyd Direct testimony at page 22.

1 *Q40. WHAT ARE YOUR RECOMMENDATIONS REGARDING THE TARGETED*
2 *INITIATIVES FOR OVERHEAD ASSETS?*
3 *A40.* I recommend that the Commission rule that the programs proposed by AEP Ohio
4 such as accelerated replacement of defective equipment and hardware are not
5 enhancements but rather the Company is just following good industry practices.
6 As discussed above, the Company is characterizing as an "enhancement"
7 maintenance activities that it should have been conducting as business-as-usual.
8
9 **C. Underground Mitigation Programs**
10 *Q41. WHAT ARE THE PROVISIONS IN THE COMPANY'S PLAN WHICH ARE*
11 *CONTAINED IN THEIR UNDERGROUND MITIGATION PROGRAMS?*
12 *A41.* The purpose of the proposed program according to Mr. Boyd on page 31 of his
13 testimony is to deal with momentary interruptions and sustained outages due to
14 failures of aging underground cable. The initiative includes substation power
15 cables, mainline feeder cables, and underground residential distribution cables.
16 The Company is targeting cables manufactured prior to 1992 to replace and/or
17 restore the integrity of the cable insulation.
18
19 *Q42. WHAT DO YOU CONCLUDE REGARDING AEP OHIO'S PROPOSED*
20 *UNDERGROUND MITIGATION PROGRAM?*
21 *A42.* The proposed incremental program will provide for replacement of power cables
22 on the basis of cable condition and operational history and for the rejuvenation or
23 replacement of URD cable on the same basis. Since the decision to replace or

1 treat cables is made largely after cables experience deterioration-related service
2 interruptions, it is questionable whether the Company's proposed program can be
3 considered proactive.
4
5 Programs such as these are becoming increasingly common with utilities, but
6 should be part of normal utility system maintenance. The replacement of
7 facilities due to deterioration from age or use is not a special condition but is a
8 part of maintaining and operating an electric utility system in a prudent fashion.
9
10 In addition, the cost to replace these underground facilities is extremely high and
11 may not result in improving AEP Ohio's SAIFI performance. For example, the
12 Company estimates that the average cost per mile to replace underground
13 substation power cable is $1,785,000 per mile in year 1 of its proposed program.
14 AEP Ohio should provide data to show how much improvement in service
15 reliability will result from investing in such an expensive program.
16
17 ***Q43. WHAT IS YOUR RECOMMENDATION CONCERNING THE COMPANY'S***
18 ***UNDERGROUND MITIGATION PROGRAMS?***
19 *A43.* I recommend that the Commission rule the Company's proposed Underground
20 Mitigation Programs is not an enhanced program but rather a part of normal
21 utility system maintenance. The Commission should also require AEP Ohio to
22 provide data to show how much improvement in service reliability will result
23 from investing in such an expensive program.

1

2 **D. Distribution Automation Programs**

3 *Q44. WHAT ARE THE PROVISIONS IN THE COMPANY'S PLAN CONTAINED*

4 *IN THE DISTRIBUTION AUTOMATION PROGRAMS?*

5 *A44.* The Company's ESRP includes the installation of distribution automation ("DA")

6 switches at selected locations. Distribution automation involves the use remote

7 sensing and remote control of various elements of the electric distribution system

8 including switches, capacitor banks, and regulators.

9

10 *Q45. WHAT ARE YOUR CONCLUSIONS AND RECOMMENDATIONS*

11 *CONCERNING THE COMPANY'S DISTRIBUTION AUTOMATION*

12 *PROGRAMS?*

13 *A45.* Distribution automation provides remote sensing and remote control capabilities

14 such that outages of distribution circuits can remotely and/or automatically be

15 shortened by isolating faulted portions and the unfaulted portions of a distribution

16 circuit and connecting the unfaulted portions of the circuit back to the system,

17 thereby restoring service. DA will normally be installed only on circuits that have

18 substation SCADA (System Control and Data Acquisition) capability and then,

19 only on those circuits whose configuration and load levels provide a significant

20 enough benefit from DA to justify the additional expense of installing DA. The

21 successful implementation of DA has the potential to provide a premium level of

22 service reliability, but not necessarily to all customers. It seems premature to start

installing such capability on a system unless AEP Ohio can demonstrate that they have SCADA capability installed on their entire distribution system.

I recommend that the Commission rule that the Company should focus first on the installation of SCADA capability throughout its distribution system before considering the deployment of Distribution Automation.

VI. SUMMARY

Q46. WHAT ARE YOUR CONCLUSIONS REGARDING AEP OHIO'S DISTRIBUTION SERVICE RELIABILITY?

A46. Based on my review, my findings are as follows:

1. System reliability index performance, with major storm data included, has become increasingly less reliable and more divergent from reliability indices with storm data excluded, especially in 2003 and 2004.
2. AEP Ohio's current vegetation management program is described as performance-based, and I believe this has contributed to the deterioration in the Company's reliability index performance, especially during major storms.
3. An aggressive program to deal with trees outside the right-of-way needs to be specified and made part of the vegetation management effort.
4. The enhanced overhead line inspection program does not appear to be significantly different from the Company's existing program.
5. Parts of the Company's overhead mitigation program appear to represent incremental efforts that address significant reliability concerns regarding fuse

cutouts and lightning arrestors that have been demonstrating increasing failure rates. This 34.5 kV program, however, while laudable, does not reflect an incremental effort.

6. The parts of the enhanced reliability programs that deal with the replacement of aging equipment should not be considered as incremental to normal utility practice.
7. The installation of SCADA capability in those substations which do not currently have it should take precedence over more sophisticated distribution automation efforts.
8. The Plan is deficient in several areas addressing implementation details, expected reliability benefits, formalized reporting, and regulatory review.

Q47. WHAT ARE YOUR RECOMMENDATIONS?

A47. My recommendations are as follows:

I recommend that the Commission rule that AEP Ohio's proposed ESRP consists of routine distribution reliability matters and should not be approved as part of the Company's ESP. AEP Ohio has not shown that significant investment, beyond what is currently being done is necessary for distribution reliability enhancement.

Based on my review of the Company's ESRP, I have the following additional recommendations:

I recommend that the Commission require a minimum data retention period of five years which is needed in order to have a reasonable chance of correlating the

level of distribution system electric service reliability that results from specific planning, maintenance, or operating policies.

I recommend that the Commission rule that the Company's proposed Vegetation Management Programs, while an improvement over its current performance based program, is not an enhancement but rather a reflection of additional tree trimming needed as a result of their prior program.

Additionally, the Company's vegetation management plan should include provisions to manage (i.e., trim or remove) trees outside of the right-of-way.

I recommend that the Commission rule that AEP Ohio's proposed Overhead Circuit Inspection and Mitigation Initiative is not truly enhanced but rather that AEP Ohio should now begin following good industry practice as required by Rule 27 of the ESSS – which it should have been doing in the normal course of business.....

I recommend that the Commission rule that the programs proposed by AEP Ohio such as accelerated replacement of defective equipment and hardware are not enhancements but rather the Company is just following good industry practices. As discussed above, the Company is characterizing as an "enhancement" maintenance activities that it should have been conducting as business-as-usual.

I recommend that the Commission rule the Company's proposed Underground Mitigation Programs is not an enhanced program but rather a part of normal utility system maintenance. The Commission should also require AEP Ohio to provide data to show how much improvement in service reliability will result from investing in such an expensive program.

I recommend that the Commission rule that the Company should focus first on the installation of SCADA capability throughout its distribution system before considering the deployment of Distribution Automation.

Q48. DOES THIS CONCLUDE YOUR TESTIMONY?

A48. Yes. However, I reserve the right to incorporate new information that may subsequently become available. I also reserve the right to supplement my testimony in the event that AEP Ohio submits new or corrected financial or other data in connection with this proceeding.

COLUMBUS SOUTHERN POWER COMPANY'S AND OHIO POWER COMPANY'S RESPONSE TO OHIO CONSUMERS' COUNSEL DISCOVERY REQUESTS FIRST SET CASE NO. 03-2570-EL-UNC CASE NO. 06-222-EL-SLF

INTERROGATORY REQUEST

21. What criteria are utilized by AEP in designating a weather event or storm as "major" and, therefore, excludable for purposes of reporting SAIDI performance as contained on page 4 of the Final Report (see Ohio Adm. Code 4901:1-10-10(B)(3) and Ohio Adm. Code 4901:1-10-11(B)(1))?

RESPONSE:

The criteria used for declaring outages part of a weather event of storm as "major" for reliability analysis and reporting are:

1) Restoration efforts exceed 24 hours.

2) Assistance from outside the District is requested.

Prepared by: Bob Ivinskas

AEP OHIO'S RESPONSE TO THE OFFICE OF THE OHIO CONSUMER COUNSEL INTERROGATORY REQUESTS THIRD SET CASE NO. 08-917-EL-SSO & CASE NO. 08-918-EL-SSO

INTERROGATORY REQUEST NO. 3-34.

What are the annual target values and the actual performance values for CSP and OP for the following reliability indices for the past four years; i.e. from 2004 through 2007:

a. Customer Average Interruption Duration Index ("CAIDI")?
b. System Average Interruption Duration Index ("SAIDI")?
c. System Average Interruption Frequency Index ("SAIFI")?
d. Average System Availability Index ("ASAI")?
e. Momentary Average Interruption Index ("MAIFI")?
f. Other reliability indices used by the Company?

RESPONSE:

a. Customer Average Interruption Duration Index ("CAIDI")?

	CSP		OP	
Year	Target	Actual	Target	Actual
2004	161.2	116.8	215.6	144.4
2005	161.20	130.69	215.60	146.73
2006	161.20	113.83	215.60	137.63
2007	161.20	118.62	215.60	131.29

b. System Average Interruption Duration Index ("SAIDI")?

	CSP		OP	
Year	Target	Actual	Target	Actual
2004	163.5	217.4	218.6	209.5
2005	163.50	247.59	218.60	221.71
2006	163.50	166.79	218.60	194.74
2007	163.50	198.02	218.60	174.73

c. System Average Interruption Frequency Index ("SAIFI")?

	CSP		OP	
Year	Target	Actual	Target	Actual
2004	1.291	1.861	1.019	1.451
2005	1.29	1.89	1.02	1.51
2006	1.29	1.47	1.02	1.41
2007	1.29	1.67	1.02	1.33

American Electric Power
Columbus Southern Power Company
Rule #10
2006
Distribution System Reliability Report

1. 4901:1-10-(C)(1)

CAIDI -Customer Average Interruption Duration Index
(In Minutes)

a.	b.	c.
CAIDI Performance Target	CAIDI With Storm Exclusions	CAIDI Without Storm Exclusions
161.20	113.83	141.71

2. 4901:1-10-(C)(1)

SAIDI -System Average Interruption Duration Index
(In Minutes)

a.	b.	c.
SAIDI Performance Target	SAIDI With Storm Exclusions	SAIDI Without Storm Exclusions
163.50	166.79	239.01

3. 4901:1-10-(C)(1)

SAIFI -System Average Interruption Frequency Index

a.	b.	c.
SAIFI Performance Target	SAIFI With Storm Exclusions	SAIFI Without Storm Exclusions
1.29	1.47	1.69

4. 4901:1-10-(C)(1)

ASAI - Average System Availability Index

a.	b.	c.
ASAI Performance Target	ASAI With Storm Exclusions	ASAI Without Storm Exclusions
0.99969	0.99968	0.99955

Attachment DWC-3

American Electric Power
Ohio Power Company
Rule #10
2006
Distribution System Reliability Report

1. 4901:1-10-(C)(1)

CAIDI -Customer Average Interruption Duration Index
(In Minutes)

a.	b.	c.
CAIDI Performance Target	CAIDI With Storm Exclusions	CAIDI Without Storm Exclusions
215.60	137.63	310.36

2. 4901:1-10-(C)(1)

SAIDI -System Average Interruption Duration Index
(In Minutes)

a.	b.	c.
SAIDI Performance Target	SAIDI With Storm Exclusions	SAIDI Without Storm Exclusions
218.60	194.74	574.64

3. 4901:1-10-(C)(1)

SAIFI -System Average Interruption Frequency Index

a.	b.	c.
SAIFI Performance Target	SAIFI With Storm Exclusions	SAIFI Without Storm Exclusions
1.02	1.41	1.85

4. 4901:1-10-(C)(1)

ASAI - Average System Availability Index

a.	b.	c.
ASAI Performance Target	ASAI With Storm Exclusions	ASAI Without Storm Exclusions
0.99958	0.99963	0.99891

American Electric Power
Columbus Southern Power Company
Rule #10
2007
Distribution System Reliability Report

1. 4901:1-10-(C)(1)

CAIDI -Customer Average Interruption Duration Index
(In Minutes)

a.	b.	c.
CAIDI Performance Target	CAIDI With Storm Exclusions	CAIDI Without Storm Exclusions
161.20	118.62	121.85

2. 4901:1-10-(C)(1)

SAIDI -System Average Interruption Duration Index
(In Minutes)

a.	b.	c.
SAIDI Performance Target	SAIDI With Storm Exclusions	SAIDI Without Storm Exclusions
163.50	198.02	206.72

3. 4901:1-10-(C)(1)

SAIFI -System Average Interruption Frequency Index

a.	b.	c.
SAIFI Performance Target	SAIFI With Storm Exclusions	SAIFI Without Storm Exclusions
1.29	1.67	1.70

4. 4901:1-10-(C)(1)

ASAI - Average System Availability Index

a.	b.	c.
ASAI Performance Target	ASAI With Storm Exclusions	ASAI Without Storm Exclusions
0.99969	0.99962	0.99961

American Electric Power
Ohio Power Company
Rule #10
2007
Distribution System Reliability Report

1. 4901:1-10-(C)(1)

CAIDI -Customer Average Interruption Duration Index
(In Minutes)

a.	b.	c.
CAIDI Performance Target	CAIDI With Storm Exclusions	CAIDI Without Storm Exclusions
215.60	131.29	157.15

2. 4901:1-10-(C)(1)

SAIDI -System Average Interruption Duration Index
(In Minutes)

a.	b.	c.
SAIDI Performance Target	SAIDI With Storm Exclusions	SAIDI Without Storm Exclusions
218.60	174.73	229.82

3. 4901:1-10-(C)(1)

SAIFI -System Average Interruption Frequency Index

a.	b.	c.
SAIFI Performance Target	SAIFI With Storm Exclusions	SAIFI Without Storm Exclusions
1.02	1.33	1.46

4. 4901:1-10-(C)(1)

ASAI - Average System Availability Index

a.	b.	c.
ASAI Performance Target	ASAI With Storm Exclusions	ASAI Without Storm Exclusions
0.99958	0.99967	0.99956

CERTIFICATE OF SERVICE

I hereby certify that a copy of the *Direct Testimony of David W. Cleaver on behalf of the Office of the Ohio Consumers' Counsel,* has been served upon the following parties via regular U.S. Mail service, postage prepaid (and a courtesy copy via electronic transmission) this 31st day of October, 2008.

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