

BEFORE
THE PUBLIC UTILITIES COMMISSION OF OHIO

In the Matter of the 2016 Review of the)
Distribution Investment Rider) Case No. 17-38-EL-RDR
Contained in the Tariff of Ohio Power Company)

In the Matter of the 2017 Review of the)
Distribution Investment Rider) Case No. 18-230-EL-RDR
Contained in the Tariff of Ohio Power Company)

DIRECT TESTIMONY OF
THOMAS A. KRATT
ON BEHALF OF
OHIO POWER COMPANY

INDEX TO DIRECT TESTIMONY OF
THOMAS A. KRATT

	<u>Page No.</u>
Personal Data	1
Purpose of Testimony	2
Distribution Investment Rider Service Reliability Benefits	3

BEFORE
THE PUBLIC UTILITIES COMMISSION OF OHIO
DIRECT TESTIMONY OF
THOMAS A. KRATT
ON BEHALF OF
OHIO POWER COMPANY

1 **PERSONAL DATA**

2 **Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.**

3 A. My name is Thomas A. Kratt. My business address is 700 Morrison Road, Gahanna,
4 Ohio 43230.

5 **Q. BY WHOM ARE YOU EMPLOYED AND IN WHAT CAPACITY?**

6 A. I am employed by Ohio Power Company (“AEP Ohio” or the “Company”) as Vice
7 President – Distribution Operations.

8 **Q. PLEASE DESCRIBE YOUR EDUCATIONAL AND PROFESSIONAL**
9 **BACKGROUND.**

10 A. I received a Bachelor of Science degree in electronics engineering technology from the
11 Ohio Institute of Technology in 1983. I joined AEP Ohio affiliate Indiana Michigan
12 Power Company (“I&M”) in 1986 as a design engineer for I&M’s Cook Nuclear Plant,
13 where I worked in various capacities for 13 years. In 2000, I joined I&M Distribution,
14 where I eventually became the Manager of Distribution Systems for I&M’s Michigan
15 District. In 2010, I became the Manager of Distribution Dispatching for I&M, where I
16 was responsible for the operation of the electrical distribution grid. In July 2013, I was
17 named Vice President of Distribution Operations for I&M. I joined AEP Ohio in March
18 2019. In addition, I was a four year working member of the Nuclear Utility Group on
19 Equipment Qualification, and a contributing member to the EPRI Cable Aging and

1 Management white paper. Prior to joining AEP, I spent five years as an engineer in the
2 robotics industry.

3 **Q. WHAT ARE YOUR RESPONSIBILITIES AS VICE PRESIDENT –**
4 **DISTRIBUTION OPERATIONS FOR AEP OHIO?**

5 A. I am responsible for overseeing the planning, construction, operation, and maintenance of
6 the distribution system. My duties include the safe and reliable delivery of service to our
7 customers, the oversight and management of service extension to new customers, and the
8 restoration of service when outages occur. My responsibilities also include overseeing
9 AEP Ohio’s distribution system, reliability programs, and vegetation management
10 program. I report directly to AEP Ohio’s President, Raja Sundararajan.

11 **Q. HAVE YOU PREVIOUSLY TESTIFIED OR SUBMITTED TESTIMONY**
12 **BEFORE A STATE COMMISSION?**

13 A. Yes. I have previously submitted testimony in distribution rate case proceedings before
14 the Indiana Utility Regulatory Commission and the Michigan Public Service
15 Commission.

16 **PURPOSE OF TESTIMONY**

17 **Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?**

18 A. The purpose of my testimony is to respond to comments that the Office of the Ohio
19 Consumers’ Counsel filed in this proceeding regarding AEP Ohio’s service reliability
20 since the implementation of the Company’s Distribution Investment Rider (DIR).
21 Specifically, I explain why reliance upon reliability metric results alone is an incomplete
22 view of the DIR’s reliability benefits and discuss other reliability challenges that, while

1 impacting reliability metric results, are outside of the Company’s control and not
2 indicative of DIR program performance.

3 **DISTRIBUTION INVESTMENT RIDER SERVICE RELIABILITY BENEFITS**

4 **Q. DO YOU AGREE WITH OCC’S CONTENTION THAT THE DIR HAS NOT**
5 **IMPROVED SERVICE RELIABILITY?**

6 A. No. OCC’s claim that service reliability has not improved as a result of the Company’s
7 implementation of programs under the DIR, is predicated on OCC’s comparison of the
8 Company’s 2012 System Average Interruption Frequency Index (“SAIFI”) and the
9 Customer Average Interruption Duration Index (“CAIDI”) performance with 2017 SAIFI
10 and CAIDI results. OCC contends that the DIR is not providing reliability benefits to
11 customers because the average duration of outages in AEP Ohio’s distribution system, as
12 measured by CAIDI, was longer in 2017 than before the DIR was implemented, and the
13 number of interruptions, as measured by SAIFI, was about the same.

14 OCC’s position fails to recognize that many improvements in service reliability
15 are not measurable using SAIFI and CAIDI metrics. One example of this is pole
16 replacements. If the Company does not replace a rotting pole, there is a strong likelihood
17 that the pole may fail in the near term, likely causing an outage and increasing SAIFI. By
18 proactively replacing the rotting pole, the Company may avoid an outage altogether.
19 While this may not result in an immediate improvement to SAIFI or CAIDI, it does
20 improve service reliability for AEP Ohio’s customers.

21 Other examples include underground cable rehabilitation and out of right-of-way
22 hazard tree removal. Through these programs, the Company is proactively addressing
23 emerging challenges to customer reliability. Although no one can predict which segment

1 of cable or tree will fail next, it will happen as some point given the age and condition of
2 the Company's infrastructure and the condition of certain danger trees. Proactive
3 mitigation of these risks reduces the likelihood of outages over time. Again, these
4 investments may not be immediately evident in the Company's system-level reliability
5 metrics, but they nonetheless are important and effective. As these examples show, SAIFI
6 and CAIDI metrics are not always a useful measurement to evaluate the reliability
7 benefits of the DIR, especially with a short-term view.

8 **Q. IS IT APPROPRIATE TO REVIEW ONLY SAIFI AND CAIDI PERFORMANCE**
9 **TO DETERMINE THE RELIABILITY BENEFITS ACHIEVED UNDER THE**
10 **DIR?**

11 A. No, it is not. First, OCC selects varying years for separate reliability metrics when
12 making point-to-point comparisons to illustrate what it claims in various documents
13 submitted in these proceedings to be degrading reliability. OCC is choosing the best year
14 for each metric as its "baseline" and then comparing to recent performance. OCC's
15 argument regarding performance based upon reliability metrics, utilizing the lowest index
16 in the period as a starting point for comparison, is thus overstated in addition to being
17 incomplete, as set forth above. Comparing single years to one another also ignores the
18 fact that reliability metrics fluctuate annually due to events like weather, outages caused
19 by vehicle accidents, third-party dig-ins, and trees outside of right-of-way, that are not
20 predictable or under the Company's control. Significantly, OCC's point comparisons of
21 single years also fails to isolate specific causes and effects or otherwise account for a
22 myriad of factors that may have affected reliability during the time between those years.
23 For example, while DIR programs A, B, and C have positive reliability impacts between

1 two years being compared, adverse factors X, Y, and Z may have developed and created
2 a negative reliability impact during the intervening period.

3 It is also important to consider the average service availability, which is the
4 percentage of time a customer has received power. AEP Ohio customers can access
5 electricity twenty-four hours a day, seven days a week, and fifty-two weeks of each year
6 with very few interruptions. Although SAIFI and CAIDI metrics do play an important
7 role to identify the events and causes of service interruption, which aids in the
8 Company's effort to identify opportunities for improvement and potentially may result in
9 programs that are funded through the DIR, SAIFI and CAIDI are not definitive indicators
10 of service availability.

11 It is also important to note that that while reliability indices can provide useful
12 information, the usefulness of any particular index for any particular purpose depends
13 upon the nature of the index and its suitability to the purpose. Many of the DIR programs
14 impact SAIFI and the cumulative duration of outages as reflected in SAIDI. CAIDI,
15 however, since it reflects only the average duration of outages that do occur, is generally
16 not addressed. Average outage duration (CAIDI) reflects many factors that some of the
17 DIR activities have little ability to control, even though those same activities do yield
18 positive reliability impacts. When an outage occurs, it takes a certain amount of time for
19 personnel to travel to the problem site, assess the problem, for a crew to bring equipment
20 and supplies, and to perform the needed restoration. Successful DIR reliability programs
21 will reduce the number of times a crew needs to go out, but the crews still need adequate
22 time and equipment to safely perform a given restoration task – often in rural or remote
23 locations – such as replacing poles and restringing conductor.

1 A reliance on SAIFI and CAIDI alone also fails to take into account that the
2 Company’s investments through the DIR improve grid resiliency, which in turn impacts
3 how storms are reflected in the Company’s reliability metrics. The Commission requires
4 the use of IEEE Standard 1366 to determine major event days, which are excluded from
5 the reported reliability metrics. The IEEE 1366 defines a major event as “an event that
6 exceeds reasonable design and or operational limits of the electric power system. A major
7 event includes at least one Major Event Day (‘MED’).” A MED is defined as “a day in
8 which the daily System Average Interruption Duration Index (‘SAIDI’) exceeds a
9 threshold value” Storms that do not meet the MED criteria are classified as non-
10 major storm events and, unlike MEDs, are included in the Company’s reliability metrics.

11 As the Company makes improvements to the resiliency of the grid and improves
12 its facilities’ design and operational limits, the impact of storms is diminished, resulting
13 in a decrease in the number of MEDs. Storms that would once have been MEDs and
14 excluded from reliability metrics become sub-MEDs and are included in the reliability
15 metrics calculations, thus increasing the metrics. This leads to the appearance that
16 reliability is getting worse, when in fact, the Company is actually improving overall
17 reliability. The Company averaged 8.6 MEDs during 5.4 annual events for the five years
18 immediately preceding the start of its DIR programs in 2013. It has averaged 3.6 MEDs
19 during 3.2 events in the past five years.

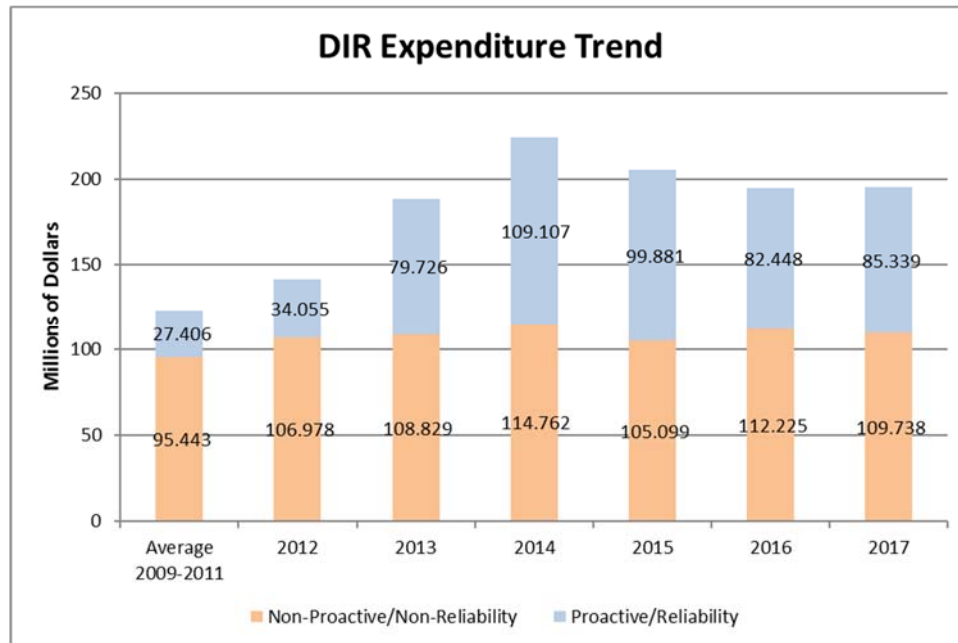
20 **Q. HOW HAVE THE COMPANY AND THE COMMISSION HISTORICALLY**
21 **EVALUATED THE DIR’S RELIABILITY BENEFITS?**

22 A. The Company and the Commission have evaluated the DIR’s reliability benefits using
23 multiple methods.

1 First, current year spending on the DIR plan’s programs is compared to the
 2 baseline spending prior to the DIR (2009-2011) for each of the program types. The 2009-
 3 2011 baseline is set using the average spending for the reliability type programs for the
 4 DIR plan as compared to the spending for these same types of programs for the years
 5 after implementation of DIR (late 2012). Also, the 2009-2011 baseline proactive versus
 6 non proactive spending is compared to each of the other years for the DIR plan. Figure
 7 TAK-1 compares the 2009-2011 baseline proactive versus non proactive spending as
 8 compared to each of the other years for the DIR plan. The chart further demonstrates the
 9 increased spending in proactive programs that the DIR makes possible.

10

Figure TAK-1



11 The above figure demonstrates that the capital investments recovered through the
 12 DIR are for programs and projects that represent only a portion of the Company’s overall
 13 distribution plant investment. The programs are proactive in nature, and are intended to
 14 replace aging infrastructure. The number of assets replaced under programs represents a

1 small number of assets compared to the total number of system assets that continue to
2 age. Similarly, reliability projects target specific assets with reliability issues that have
3 caused outages in the past. Because these programs and projects involve such a small
4 area of the total distribution system, their reliability impact may not be recognized when
5 examining the net reliability metrics for the entire distribution system. Despite other
6 factors (many of which are outside the Company's control) that have a negative impact
7 on reliability metrics during a given period, these programs and projects have a positive
8 incremental reliability impact for the areas where the programs and projects were
9 completed. This is why these investments and the recovery of these investments through
10 the DIR are so important. Stated differently, while we know the individual DIR
11 investments help maintain and improve reliability, those positive impacts are not always
12 realized in the net reliability metrics due to other dynamic factors.

13 The Non-Proactive/Non-Reliability projects are required capital expenditures that
14 relate to the installation of service to new residential and commercial customers,
15 (including the necessary transformers and meters) outage restoration, and public project
16 relocations (PPRs). PPR projects involve the relocation of distribution facilities in or
17 near public road right-of-way to accommodate projects such as road construction, water
18 and sewer line installation, and sidewalk construction.

19 Second, the Company provides the reliability quantification for both proactive
20 and reliability programs. The reliability quantification for proactive programs shows
21 avoided outages and avoided customer outage minutes for each applicable program.
22 Again, this reliability enhancement is not reflected in CAIDI and SAIFI metrics but it
23 does provide valuable information.

1 **Q. IS AEP OHIO EXPERIENCING EMERGING CHALLENGES TO CUSTOMER**
2 **RELIABILITY?**

3 A. Yes. First, service interruptions due to vegetation falling from outside rights-of-way have
4 increased significantly since the start of the DIR. Given the nature of the largely forested
5 territory, the Company experiences significantly more events impacting reliability caused
6 by trees. Ohio is home to more than 3.8 billion ash trees, and approximately one in every
7 ten trees in Ohio is an ash. The destructive emerald ash borer began in the northwest
8 Ohio in the early 2000s, and spread throughout Ohio and has now been discovered in all
9 of Ohio's 88 counties. When a tree becomes infested with emerald ash borer, it dies
10 within a few years, which makes it much more vulnerable to falling down or being more
11 easily blown over. AEP Ohio's service territory includes the more mountainous and
12 forested areas of the state. Figure TAK-2 below shows the correlation between the
13 forested areas of the state (on the left) and the Company's service territory (on the right).

Figure TAK-2



14 The emerald ash borer challenges are contributing to trees falling at an unusual rate.
15 Dead ash trees accounted for approximately 24% of trees outside of right-of-way outages

1 in 2017. AEP Ohio has implemented a program to work with property owners and
2 address hazard trees. Upon securing property owners' permission, forestry crews are
3 removing such trees from outside of the Company's rights-of-way.

4 Second, outages due to vehicle accidents have also increased. This increased
5 vehicle accident activity seems to follow the national trend of traffic accidents attributed
6 to distracted driving. The Company is working with the communities it serves to help
7 address distracted driving, but there are limited actions within AEP Ohio's control to
8 prevent vehicles accidents damaging distribution equipment.

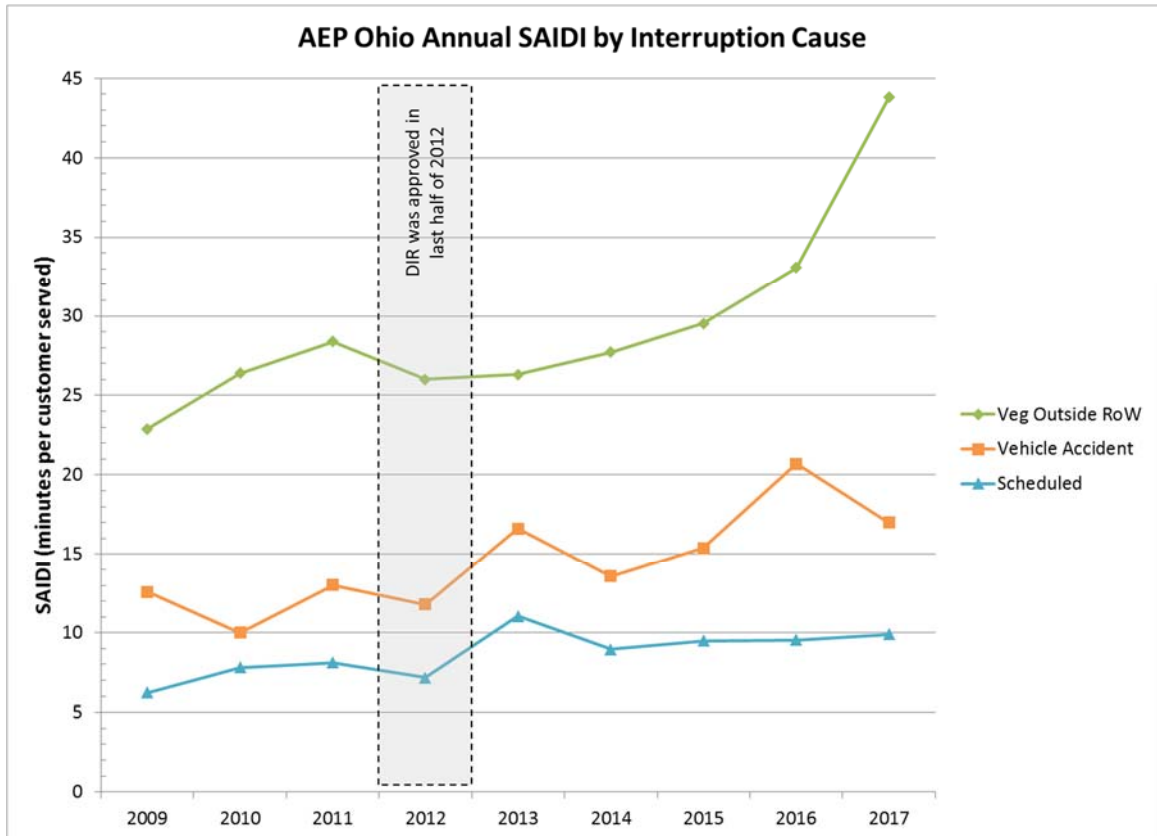
9 Third, scheduled outages have increased as crews safely implement the DIR work
10 plans and other customer-driven projects. These outages are necessary for employee
11 safety and equipment replacement. An example would be an overhead reconductoring
12 job during which all customers could not be transferred to a neighboring circuit. Added
13 reliability impacts during DIR construction projects include when customers are
14 transferred to alternate sources and faults on the alternate source interrupt the added
15 customers. Protective devices are placed in non-reclose configurations, or even more
16 sensitive settings, for worker safety while line improvements are performed. These
17 safety protections can lead to more sustained outages for causes that may have cleared
18 under a normal feed condition.

19 **Q. HAS THE COMPANY QUANTIFIED THE RELIABILITY IMPACTS OF EACH**
20 **OF THESE THREE CAUSES OF OUTAGES?**

21 A. Yes, annual System Average Interruption Duration Index ("SAIDI") trends for each of
22 those three outage causes are set forth in Figure TAK-3 below. SAIDI represents the
23 total duration of interruption (in minutes) experienced by all customers served by the

1 distribution system. SAIDI equals the total customer minutes of interruption divided by
2 the total number of customers, and it can also be calculated as SAIFI multiplied by
3 CAIDI. SAIDI is another metric to measure performance, reflecting both interruption
4 frequency and duration per event.

5 **Figure TAK-3**



6 **Q. WHAT DOES FIGURE TAK-3 REFLECT?**

7 A. Comparing the years 2016-2017 to the last three full years (2009-2011) prior to the DIR's
8 implementation reveals SAIDI increases of 13 minutes due to vegetation outside of right-
9 of-way, 7 minutes due to vehicle accidents, and 3 minutes due to scheduled interruptions.
10 In sum, it is incorrect to conclude that AEP Ohio's DIR programs are not having a

1 positive impact on reliability without fully considering the emerging challenges and the
2 other factors I outlined above.

3 **Q. DOES THIS CONCLUDE YOUR DIRECT TESTIMONY?**

4 A. Yes.

CERTIFICATE OF SERVICE

In accordance with Rule 4901-1-05, Ohio Administrative Code, the PUCO's e-filing system will electronically serve notice of the filing of this document upon the following parties. In addition, I hereby certify that a service copy of the foregoing was sent by, or on behalf of, the undersigned counsel to the following parties of record this 17th day of May, 2019, via electronic transmission.

/s/ Christen M. Blend

Christen M. Blend

E-Mail Service List:

steven.beeler@ohioattorneygeneral.gov

terry.etter@occ.ohio.gov

william.michael@occ.ohio.gov

christopher.healey@occ.ohio.gov

bryce.mckenney@occ.ohio.gov

Attorney Examiners:

sarah.parrot@puco.ohio.gov

greta.see@puco.ohio.gov

This foregoing document was electronically filed with the Public Utilities

Commission of Ohio Docketing Information System on

5/17/2019 3:08:18 PM

in

Case No(s). 17-0038-EL-RDR, 18-0230-EL-RDR

Summary: Testimony - Direct Testimony of Thomas A. Kratt on Behalf of Ohio Power Company electronically filed by Ms. Christen M. Blend on behalf of Ohio Power Company