EXHIBIT NO. _____

In the Matter of the Application of Ohio Power Company for an Increase in Electric Distribution Rates	)))	Case No. 20-0585-EL-AIR
In the Matter of the Application of Ohio Power Company for Tariff Approval	)))	Case No. 20-0586-EL-ATA
In the Matter of the Application of Ohio Power Company for Approval to Change Accounting Methods	)))	Case No. 20-0587-EL-AAM

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

Management Policies, Practices & Organizations

Operating Income

Rate Base

Allocations

Rate of Return

Rates and Tariffs

X Other

Filed: June 15th, 2020

INDEX TO DIRECT TESTIMONY OF
THOMAS A. KRATT

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

I. PERSONAL DATA

Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

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

Q. BY WHOM ARE YOU EMPLOYED AND WHAT IS YOUR POSITION?

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

Q. WOULD YOU PLEASE DESCRIBE YOUR EDUCATIONAL AND PROFESSIONAL BACKGROUND?

A. I received a Bachelor of Science degree in electronics engineering technology from the Ohio Institute of Technology in 1983. In 2019, I received a Master's degree in Organization Leadership and Supervision from Purdue University. I joined AEP Ohio affiliate Indiana Michigan Power Company ("I&M") in 1986 as a design engineer for I&M's Cook Nuclear Plant, where I worked in various capacities for 13 years. In 2000, I joined I&M Distribution, where I eventually became the Manager of Distribution Systems for I&M's Michigan District. In 2010, I became the Manager of Distribution Dispatching for I&M, where I was responsible for the operation of the electrical distribution grid. In July 2013, I was named Vice President of Distribution Operations for I&M. I joined AEP Ohio and accepted my current position in March 2019.

Q. WHAT ARE YOUR RESPONSIBILITIES AS VICE PRESIDENT-DISTRIBUTION OPERATIONS?

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

Q. HAVE YOU PREVIOUSLY SUBMITTED TESTIMONY IN ANY REGULATORY PROCEEDINGS?

A. Yes. I have previously submitted testimony in distribution rate case proceedings before the Indiana Utility Regulatory Commission and Michigan Public Service Commission. I have testified on behalf of AEP Ohio before the Public Utilities Commission of Ohio in Case Nos. 17-0038-EL-RDR and 18-230-EL-RDR .

II. PURPOSE OF TESTIMONY

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

A. The purpose of my testimony is to provide an overview of the Company's distribution system and to support the Company's distribution planning and expenditures. I will begin by discussing the condition of AEP Ohio's distribution system and the metrics the Company uses to measure the reliability of its distribution system as well as emerging reliability challenges. I will then present the Company's Distribution Work Plan ("Plan").

To execute this Plan and the associated work involved in operating AEP Ohio's

distribution system, I will explain the need for continuation of the Enhanced Service Reliability Rider ("ESRR") and Distribution Investment Rider ("DIR"). I will also provide a forecast of the anticipated needs of each rider and support the level of distribution operation and maintenance ("O&M") expenses during the Test Year from December 1, 2019 through November 30, 2020.

Finally, I will also discuss the volatility associated with major storms in Ohio and the need to continue support of the Storm Damage Recovery Rider ("SDRR").

Q. ARE YOU SPONSORING ANY EXHIBITS?

A. Yes, I sponsor the following exhibits:

- Exhibit TAK-1 – Map of AEP Ohio Service Territory
- Exhibit TAK-2 – AEP Ohio DIR Work Plan Components
- Exhibit TAK-3 – AEP Ohio Distribution Work Plan Project Detail (2021-2022)

III. EXECUTIVE SUMMARY

Q. PLEASE SUMMARIZE YOUR TESTIMONY.

A. AEP Ohio has made and is continuing to make significant capital investments in its distribution system in support of maintaining and improving reliability, modernizing and hardening the grid, and enhancing the customer experience. As I explain in Section V. "Reliability Metrics" (pg. 8) of this testimony, these investments are ongoing in part because AEP Ohio's service territory continues to experience operating challenges related to vegetation outside of the right-of-way ("ROW") and equipment failures due to aging assets. Furthermore, investments and upgrades will need to continue, as new technologies, such as electric vehicles, become more commonplace and to meet the needs, expectations,

and changing preferences of our customers.

Improving reliability requires a long-term strategy with multiple, coordinated activities on varied fronts. Reliability is a dynamic challenge, and without continuous improvement, the general reliability of the distribution system will decline over time. Accordingly, the Company has designed a Distribution Work Plan to provide support for capital and operations funding to maintain and improve the distribution system's current capabilities and reliability, enhance the customer experience, and support advanced technologies. As I discuss below in Section VII. "AEP Ohio Distribution Work Plan" (pg. 19), AEP Ohio's Plan is a comprehensive, forward-looking work plan under which the Company is making investments to support the programs and customer-driven projects tracked, completed, and recovered under the ESRR and DIR.

The purpose of the Company's Distribution Work Plan is to improve the customer experience by improving reliability, addressing public safety, and leveraging technology to benefit the distribution grid. The Plan focuses on four key objectives:

- Maintain and improve safety;
- Focus on the customer experience;
- Address reliability, resiliency, and aging infrastructure; and
- Maintain flexibility.

As I describe in Section VII. "AEP Ohio Distribution Work Plan" (pg. 19) this testimony, the Plan is divided into four main categories of capital investments, which are implemented through five programs, as shown below in Figure TAK-1. As further discussed below, successful implementation of the Plan is highly dependent upon continuation of the ESRR and DIR.

Figure TAK-1 – AEP Ohio Distribution Work Plan
Categories & Programs

Category	Program
Distribution Asset Management	Major Projects (Capacity Additions, Station & Line Components)
Customer, City and State Requirements, and Other	Customer Service, Transformers, Meters, Make Ready, Public Project Relocations & Restoration
Risk & Asset	Inspection Programs (Safety, Poles, Reliability)
Reliability	Vegetation Management
	Asset Renewal and Reliability

Continued capital investment is a key component in AEP Ohio's strategy for maintaining the distribution system and improving reliability. Another key component is the O&M associated with each of these capital projects. Additionally, the O&M maintenance programs, such as the vegetation management program, are also an important element in the process to identify and prioritize the capital projects that need to be performed.

As I discuss in Subsection A of Section VII. "Enhanced Service Reliability Rider" (pg. 22), the ESRR facilitated the transition to, and maintenance of, a cycle-based vegetation management program for trees inside ROW. In order to manage vegetation growth on the distribution system, my testimony explains why it is important to continue the ESRR. The ESRR is expected to maintain the improvement in reliability due to reduced

trees inside ROW-related interruptions and decrease outages due to trees outside ROW through integration of the Danger Tree Program into the systematic 4-year trimming cycle.

As I also explain in Subsection B of Section VII. "Distribution Investment Rider" (pg. 27), the DIR supports the Company's asset renewal, distribution capacity, and infrastructure improvements. In order to meet customer demand to maintain and improve reliability as well as support customer expectations and advanced technologies, AEP Ohio proposes to continue the DIR. DIR programs are key to future safety and distribution reliability improvements, and are necessary to simply maintain the gains in safety and reliability already achieved. However, capital expenditures under the DIR are not all reliability-based but also include nondiscretionary work, such as the integration of new residential and commercial customers, capacity, and outage restoration.

IV. AEP OHIO DISTRIBUTION SYSTEM CHARACTERISTICS

Q. PLEASE BRIEFLY DESCRIBE THE AEP OHIO SERVICE TERRITORY.

A. AEP Ohio services approximately 1.5 million customers in Ohio in a service area that covers approximately 19,800 operating square miles and includes nearly 1,000 communities located in 61 of the state's 88 counties. Notably, AEP Ohio is Ohio's largest electric distribution utility ("EDU") with a service territory that covers the state capital and most populous city, Columbus, as well as heavily forested, rural areas including portions of the Appalachian Mountain chain. The Company's Distribution Operations organization includes six geographic districts: Athens, Canton, Chillicothe, Columbus, Newark and Western Ohio, which are served by 42 service centers. Customer density as well as customer growth varies significantly across the AEP Ohio service territory. Please refer to Exhibit TAK-1 for a map of the AEP Ohio Service Territory.

Q. PLEASE PROVIDE AN OVERVIEW OF AEP OHIO'S DISTRIBUTION SYSTEM.

A. AEP Ohio's distribution system includes approximately 1,600 distribution circuits and approximately 32,000 miles of primary overhead distribution lines and approximately 7,400 miles of primary underground distribution lines operated at voltages from 4.16 kV to 34.5 kV. Residential and commercial customers are served at secondary voltages via approximately 480,000 overhead and underground distribution transformers. AEP Ohio operates and maintains approximately 525 distribution substations as well as five specialized secondary networks in downtown Columbus and Canton, which are served by four distribution substations and approximately 360 transformers.

Q. WHAT IS THE CURRENT STATE OF THE ASSETS ON THE AEP OHIO DISTRIBUTION SYSTEM?

A. The AEP Ohio distribution system is comprised of assets ranging from new equipment to equipment installed more than seventy years ago. AEP Ohio's service territory continues to experience operating challenges related to aging assets. Although age alone does not determine when assets fail, assets are more likely to fail when they reach the end of their design life, and older assets can be harder to replace when they fail because it is often difficult to obtain available parts for aging equipment. Older assets also pose safety risks from failures during operation.

Q. WHAT IS THE CONDITION OF VEGETATION ON AEP OHIO'S DISTRIBUTION SYSTEM?

A. Vegetation, particularly trees outside ROW, remains a principal cause of outages in AEP Ohio's service territory. Figure TAK-2 below shows the correlation between the forested

areas of the state (on the left) and the Company's service territory (on the right). AEP Ohio's service territory includes the more mountainous and forested areas of the state. Given the nature of the largely forested territory, the Company experiences more events impacting reliability caused by trees.

Figure TAK-2

Source: *Ohio Forests 2016*, USDA (December 2018)

Furthermore, temperatures in the Company's service territory are temperate and facilitate an environment that allows for high tree density and growth rates. Similarly, AEP Ohio's service territory has a high tree growth season due to high levels of rainfall, the variation in latitude, and the variation in elevation. These factors emphasize the challenges that vegetation can cause and why managing vegetation under these conditions is critical.

V. RELIABILITY METRICS

Q. HOW DOES THE COMPANY MEASURE THE RELIABILITY OF ITS DISTRIBUTION SYSTEM?

A. Consistent with typical utility practices, the indices that AEP Ohio uses to gauge service reliability are the System Average Interruption Frequency Index ("SAIFI"), Customer

Average Interruption Duration Index ("CAIDI"), and the System Average Interruption Duration Index ("SAIDI"). These indices are defined in the Institute of Electrical and Electronics Engineers ("IEEE") Standard 1366-2012, which is the basis of reliability reporting under O.A.C. 4901:1-10-10 and -11, and are described in general terms below:

- *SAIFI*: Indicates how often the average customer experiences a sustained interruption over a predefined period of time. It is the total number of customers interrupted divided by the total number of customers served.
- *CAIDI*: Represents the average time required to restore service. It is the sum of customer-minutes of interruption from each outage divided by the total number of customers interrupted.
- *SAIDI*: Represents the total time the average customer is without service due to sustained interruptions over a predefined period of time. It is the sum of customer-minutes of interruption from each outage divided by the total number of customers served. It can also be calculated as SAIFI multiplied by CAIDI.

AEP Ohio calculates its SAIFI and CAIDI indices excluding major events to provide a more representative view of how the system operates during normal operating conditions. Major events are classified as a period of time when the electricity system is faced with challenges beyond its normal design criteria. Major storms are determined based on the methodology outlined in IEEE Standard 1366,[1] as adopted by the Public Utilities Commission of Ohio ("Commission") in O.A.C. 4901:1-10-01(T). These indices

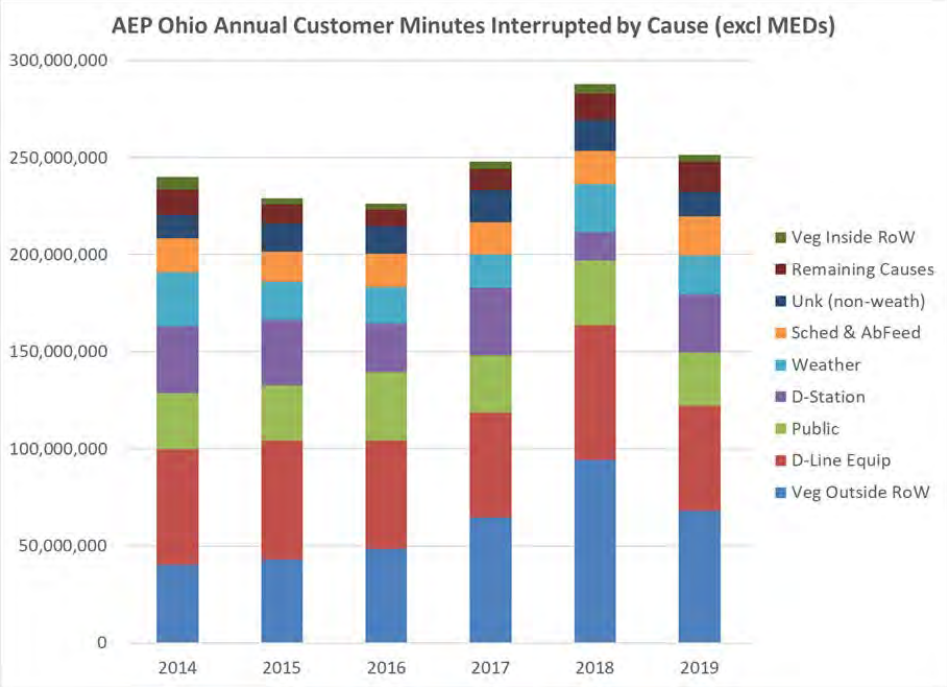
[1] IEEE Standard 1366 defines a major event as "an event that exceeds reasonable design and or operational limits of the electric power system. A major event includes at least one Major Event Day ('MED')." A MED is defined as "a day in which the daily System Average Interruption Duration Index ('SAIDI') exceeds a threshold value . . . ." Storms that do not meet the MED criteria are classified as non-major storm events and, unlike MEDs, are included in the Company's reliability metrics.

provide insight into how well the Company is minimizing service interruptions. However, as discussed below, while reliability metrics are important they do not tell the entire story.

Q. PLEASE SUMMARIZE THE PRIMARY CAUSES OF OUTAGES IN AEP OHIO'S SERVICE TERRITORY.

A. Vegetation outside ROW and equipment failures are the main causes of outages in AEP Ohio's service territory as seen in Figure TAK-3. Vegetation outside of ROW was responsible for about 27 percent of SAIDI and 16 percent of SAIFI in AEP Ohio's Rule 10 report for performance year 2019, and distribution line equipment-related failures represented almost 22 percent of SAIDI and 24 percent of SAIFI.

Figure TAK-3



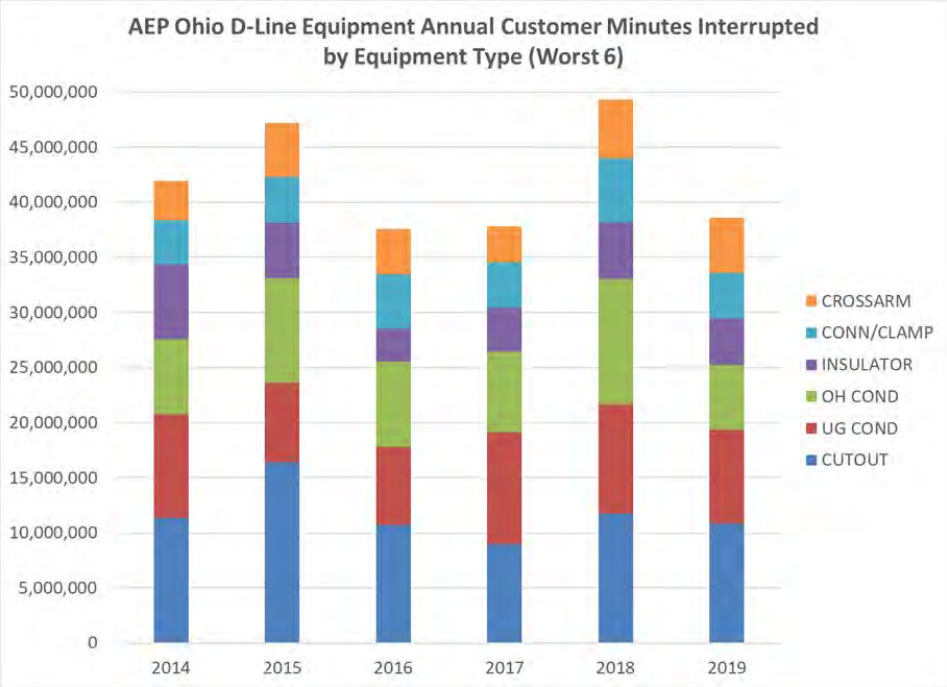
Continuance of the ESRR will maintain the improvements for vegetation inside the ROW-related outages, target danger trees outside of our ROW, and enhance the customer experience. Additional investment in distribution assets through continuation

of the DIR is needed to address the equipment failure-related causes of customer outages. I discuss the ESRR and DIR in more detail later in my testimony.

Q. WHAT ARE AEP OHIO'S PRIMARY EQUIPMENT CHALLENGES?

A. Cutouts and underground and overhead conductors are the main types of equipment failures seen in AEP Ohio's service territory as shown in Figure TAK-4. AEP Ohio tracks all equipment failures. From this data, AEP Ohio is able to determine how specific equipment failures are contributing to AEP Ohio's reliability. The contributions to SAIDI from different types of equipment failures are provided in Figure TAK-4 below:

Figure TAK-4



In addition, in reviewing AEP Ohio's distribution system, the Company has determined that there are other aging assets that pose potential issues and therefore need to be addressed proactively. Underground conductors are an example of an asset that, as they continue to age, pose additional safety and reliability issues.

Based on an analysis of this specific equipment failure data, the Company has designed its Distribution Work Plan, specifically the DIR Asset Renewal and Reliability programs, to address these causes and equipment types to optimize benefits over an extended period of time.

Q. HOW HAVE DISTRIBUTION RELIABILITY EFFORTS UNDER THE DIR AND ESRR BENEFITED AEP OHIO CUSTOMERS?

A. AEP Ohio strives to provide customers the best reliability it can with existing resources and system conditions. As shown in Figure TAK-5, the Company has continued to meet its reliability performance standards as demonstrated by its SAIFI and CAIDI performance for the past five years, with the exceptions of the growing vegetation outside ROW issues reflected in 2018 and 2019 metrics. Notably, if interruptions caused by vegetation outside ROW during 2019 were at the level experienced during 2013-2016 (the years in which the reliability targets were set), AEP Ohio's reported 2019 SAIFI would have been 1.14 interruptions. This is significantly better than the 2019 target and is an indicator of the Company's increased reliability.

Figure TAK-5 – 2015-2019 AEP Ohio Reliability Metrics[2]
(Per O.A.C. Rule 1-10-10(B))

Year	SAIFI	SAIFI Standard	CAIDI	CAIDI Standard
2015	1.13	1.20	139.0	150.00
2016	1.08	1.20	143.4	150.00
2017	1.15	1.20	146.0	150.00
2018	1.30	1.19	150.3	149.00
2019	1.20	1.18	141.0	148.00

[2] Data excludes major events and transmission outages.

This view provides a representative indication of the distribution system performance for AEP Ohio. As shown by Figure TAK-5, the SAIFI and CAIDI indices were slightly elevated in 2018. An improvement in both SAIFI and CAIDI performance was seen in 2019. While these reliability indices indicate a comparable performance with previous years, AEP Ohio will need to make substantial investments in infrastructure to continue to maintain and improve reliability performance. The primary drivers for such performance include the Company's successful vegetation management program as supported by the ESRR along with the completion of the Company's DIR Work Plan that incorporates the mitigation of the worst performing circuits through upgrades, asset renewals, and sectionalizing initiatives on targeted circuits each year.

Q. HOW DO RELIABILITY PROJECTS AND PROGRAMS IMPACT RELIABILITY METRICS FOR THE ENTIRE DISTRIBUTION SYSTEM?

A. Generally, reliability projects target specific assets with reliability issues or circuits with Customer Minutes Interrupted ("CMI"). Because reliability metrics do not discretely measure the impacts of individual projects or programs, but rather measure the impacts for the entire distribution system, these reliability projects and programs, which involve such a small portion of the total distribution system, may not be recognized when examining the Company's reliability metrics for the entire distribution system. For example, for overhead wires, approximately 310 line miles need to be addressed in order to impact roughly 1% of the Company's overhead wires system per year. AEP Ohio has been able to address about half that number of overhead line miles in our historical DIR Work Plans. Despite other factors (many of which are outside the Company's control) that have a negative impact on reliability metrics during a given period, these projects and programs have a positive

incremental reliability impact for the areas where the programs and projects were completed. This is why these investments and the recovery of these investments through the DIR and ESRR are so important.

However, as discussed further below, capital expenditures under the DIR are not all reliability-based but also include nondiscretionary work, such as the integration of new residential and commercial customers, capacity, and outage restoration.

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

A. No, it is not. Reliance upon reliability metric results alone is an incomplete view of the DIR and ESRR's reliability benefits. Reliability metrics fluctuate annually due to events like weather, outages caused by vehicle accidents, third-party dig-ins, and trees outside ROW, that are not predictable or under the Company's control and not indicative of the DIR or vegetation management programs performance.

Many proactive improvements in service reliability are not measureable by only comparing year-to-year SAIFI and CAIDI metrics, because they avoid future outages and do not eliminate historical outage causes. One example of this is pole replacements. If the Company does not replace a rotting pole, there is a strong likelihood that the pole may fail in the near term, likely causing an outage and increasing SAIFI. While this may not result in an immediate improvement to SAIFI or CAIDI (because it does not eliminate the source of outages from prior periods), it does maintain and improve service reliability for AEP Ohio's customers.

Average outage duration (*i.e.*, CAIDI) reflects many factors that some of the DIR

and vegetation management activities have little ability to control, even though those same activities do yield positive reliability impacts. When an outage occurs, it takes a certain amount of time for personnel to travel to the problem site, assess the problem, for a crew to bring equipment and supplies, and to perform the restoration. Successful reliability programs will reduce the number of times a crew needs to go out, but the crews still need adequate time and equipment to safely perform a given restoration task – often in rural or remote locations – such as replacing poles and restringing conductors.

A reliance on SAIFI and CAIDI alone also fails to take into account the Company's investments through the DIR to improve grid resiliency, which in turn impacts how storms are reflected in the Company's reliability metrics. As discussed above, the Commission requires the use of IEEE Standard 1366 to determine MEDs, which are excluded from the reported reliability metrics. As the Company makes improvements to the resiliency of the grid and enhances its facilities' design and operational limits, the impact of storms is diminished, resulting in a decrease in the number of MEDs. Storms that would have been MEDs and excluded from reliability metrics become sub-MEDs and are included in the reliability metrics calculations, thus increasing the metrics. This could be interpreted as suggesting reliability is getting worse, when in fact, overall reliability is improving. The Company averaged 8.8 MEDs during 5.4 annual events for the five years immediately preceding the start of its DIR programs in 2012. It has averaged 4.8 MEDs during 4.4 events in the past five years. Further information pertaining to major storms is addressed later in my testimony.

Finally, in addition to the potential appearance of reliability getting worse, non-major storms are also detrimental to planned distribution maintenance and project work,

such as the reliability programs supported by the ESRR and DIR. Similar to the impact of major storms, the funds used for these planned activities are diverted to cover the expense for non-major storm restoration, potentially delaying or disrupting their completion. Company witness Kelso discusses the level of non-major event restoration O&M included in the forecast and an associated cost recovery proposal in her testimony.

VI. EMERGING RELIABILITY CHALLENGES

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

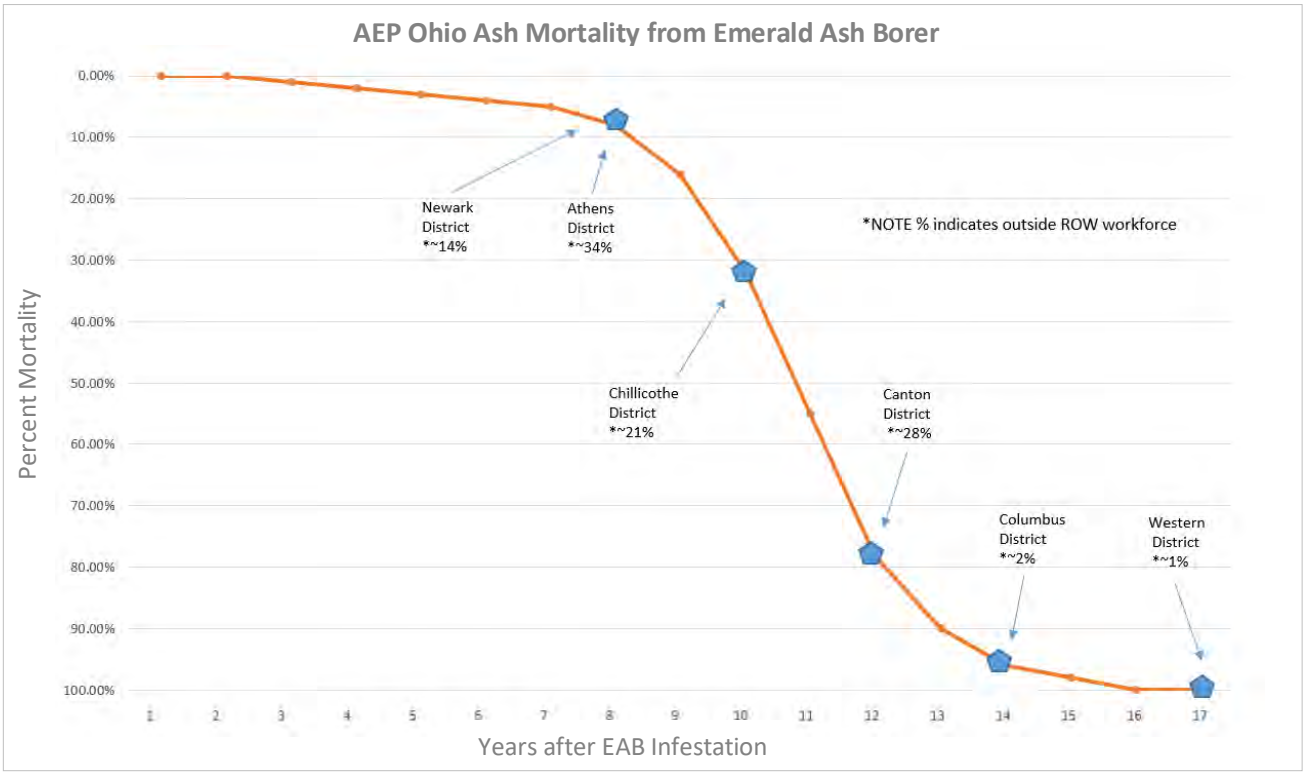
A. Yes. First, as discussed above, service interruptions due to vegetation falling from outside the ROW have increased significantly since the start of the DIR in 2012. The Company began seeing sharp increases in annual SAIDI due to trees outside the ROW in 2017 with SAIDI performance for such outages peaking in 2018. However, as shown in Figure TAK-3, the Company has seen a decreasing trend in 2019 due to AEP Ohio's initiatives to drive the customer experience, including implementation of the Danger Tree Program in 2018.

Ohio is home to more than 3.8 billion ash trees, and approximately one in every ten trees in Ohio is an ash.[3] The destructive emerald ash borer ("EAB") began in northwest Ohio in the early 2000s, and spread throughout Ohio and has now been discovered in all of Ohio's 88 counties. Several counties have lost more than 95 percent of their ash trees to EAB since its arrival.[4] When a tree becomes infested with EAB, it dies within a few

[3] *Ohio Forests 2016*, United States Department of Agriculture (December 2018), https://www.fs.fed.us/nrs/pubs/rb/rb_nrs118.pdf.
[4] *Id*.

years, which makes it much more vulnerable to falling down or being more easily blown over. The EAB challenges are contributing to trees falling at an unusual rate. While ash trees account for approximately 10 percent of the total tree population in Ohio,[5] dead ash trees represent a quarter of the Company's trees outside of ROW outages and that number is growing.[6] Figure TAK-6 below shows EAB infestation and tree deaths as it relates to each of the Company's six districts.

Figure TAK-6



Accordingly, as discussed further below, AEP Ohio implemented a program in 2018 to work with property owners and to address danger trees - the aforementioned Danger Tree Program. Upon securing property owners' permission, forestry crews are removing such

[5] *Id*.
[6] From January 1, 2020 through February 21, 2020, dead ash trees accounted for approximately 32 percent of trees outside of ROW outages.

trees from outside of the Company's ROW. AEP Ohio is also planning to maintain its proactive, four-year trimming cycle for trees inside our ROW that optimizes cost while providing a systematic vegetation management program that has significantly reduced trees inside ROW-caused outage events since the ESRR's approval in mid-2009.

Second, distribution line equipment failures were the largest cause contributor to SAIFI and second largest SAIDI contributor in 2019 showing an increase from 2017 to 2019 in SAIFI (0.024 interruptions) and SAIDI (9 minutes). The Company is concerned with these increases, but is cautious in its reaction because this cause had improved the prior two years and this cause can vary noticeably from year to year. The leading contributors to equipment failure are underground cable, cutouts, and connectors. AEP Ohio has been utilizing asset programs to combat the perennially high equipment failure cause with relatively small amounts of work (compared to overall system assets).

Third, scheduled outages have increased as crews safely implement the DIR programs and other customer-driven projects. These outages are necessary for employee safety and equipment replacement. An example would be an overhead reconductoring job during which all customers could not be transferred to a neighboring circuit. Outages associated with scheduled distribution line work (including those impacting customers while they were abnormally fed from alternate sources) accounted for 10% of the annual SAIFI in 2019. There are also outages associated with scheduled work to enhance employee safety. Protective devices are placed in non-reclose configurations, or even more sensitive settings, for worker safety while line improvements are performed. These safety protections can lead to more sustained outages for causes that may have cleared under normal feed condition.

Comparing the years 2018-2019 to the last three full years (2009-2011) prior to the DIR's implementation reveals SAIDI increases of 29 minutes due to vegetation outside of ROW, 4.5 minutes due to distribution line equipment failures, and 3.8 minutes due to scheduled and abnormal feed interruptions. The Company's Distribution Work Plan is designed specifically to reverse these trends.

AEP Ohio's 2020 Rule 10 Action Plan contains additional details pertaining to the Company's efforts to address outages as a result of these emerging reliability challenges.

VII. AEP OHIO DISTRIBUTION WORK PLAN ("PLAN")

Q. PLEASE DESCRIBE AEP OHIO'S DISTRIBUTION RELIABILITY STRATEGY.

A. Improving reliability requires a long-term strategy with multiple, coordinated activities on varied fronts. Reliability is a dynamic challenge, and without continuous improvement, the general reliability of the distribution system will decline over time. AEP Ohio's distribution reliability strategy is one of continuous process improvement where ongoing analysis identifies opportunities for improvement. Many factors influence reliability such as weather, vegetation management, aging infrastructure, maintenance activities, system operation and design, advances in new technologies, experienced and skilled labor, materials and available funding resources. The Company has designed its Distribution Work Plan to align with all of these factors, including the replacement of aging infrastructure through the DIR and targeting of danger trees outside the ROW and continued cyclic vegetation maintenance through the ESRR.

Q. WHAT IS THE PURPOSE AND KEY OBJECTIVES OF AEP OHIO'S DISTRIBUTION WORK PLAN?

A. The purpose of the Plan is to improve the customer experience by improving

reliability, addressing public safety, and leveraging technology to benefit the distribution grid. The Plan focuses on four key objectives:

- *Maintain and improve safety* – The safety of the public, AEP Ohio's employees, and its contractors is the first priority. Safety is a foundational element of all of AEP Ohio's planned distribution system improvements. In addition, AEP Ohio has designed specific programs, such as inspections and replacing aging assets, to reduce the probability of safety incidents.
- *Focus on the customer experience* – A key principle of AEP Ohio's distribution planning efforts is focusing on the customer experience. This means reducing the number of outages or avoiding outages altogether, responding in a safe and timely manner to outages, and giving customers tools and information that will allow them to use electricity more efficiently.
- *Address reliability, resiliency, and aging infrastructure* – AEP Ohio has developed its Plan to address the principal causes of customer outages on its system (e.g., vegetation management, aging infrastructure) and to improve system resiliency – that is, the ability of the system to minimize the number and duration of customer outages no matter the cause.
- *Maintain flexibility* – Over time, AEP Ohio will need to be able to respond to changing conditions and modify its Plan. This may include introducing additional programs, modifying programs, or shifting resources between programs to address emerging issues. Flexibility is key to allow AEP Ohio to effectively and efficiently respond to the needs of its customers, the distribution system, and changes in equipment and technology.

Q. WHAT ARE THE MAIN CATEGORIES OF INVESTMENTS IN THE PLAN?

A. AEP Ohio's Distribution Work Plan is comprised of the programs and customer-driven projects tracked, completed, and recovered under the ESRR and DIR. The Plan is divided into four main categories of capital investments, which are implemented through five programs, as shown in Figure TAK-7 below. Further information about these programs is also provided in Exhibits TAK-2 and TAK-3.

Figure TAK-7 – AEP Ohio Distribution Work Plan
Category & Program Descriptions

Category	Program	Description
Distribution Asset Management	Major Projects (Capacity Additions, Station & Line Components)	AEP Ohio has identified specific projects that are needed to address capacity constraints, improve outage recovery, replace or upgrade aging or obsolete station equipment, and perform voltage conversions of select stations and distribution circuits.
Customer, City and State Requirements, and Other	Customer Service, Transformers, Meters, Make Ready, Public Project Relocations & Restoration	AEP Ohio must perform nondiscretionary work to provide new or expanded service to customers, including the installation of necessary transformers and meters, as well as to restore service.
Risk & Asset	Inspection Programs (Safety, Poles, Reliability)	AEP Ohio will perform inspections designed to identify potential hazards on the distribution system, promote public safety, and help prioritize projects in the Asset Renewal and Reliability Program discussed below (e.g., cutouts poles, conductors). Some of these programs are required by Commission rules.
Reliability	Vegetation Management	AEP Ohio manages vegetation within its distribution ROW on a four-year trimming cycle. The company has also begun working with property owners to target the removal of dead or dying trees located outside the Company's ROW that pose a threat to its facilities. Trees outside ROW have emerged as a top cause of interruptions during the past few years.
	Asset Renewal and Reliability	AEP Ohio has developed a suite of programs to replace aging infrastructure and harden the system to improve reliability and resiliency.

Capital investment is a key component in AEP Ohio's strategy for maintaining the distribution system and improving reliability. Another key component is the O&M associated with each of these categories. Additionally, the O&M maintenance programs,

such as the vegetation management program, are an important element in the process to identify and prioritize the capital projects that need to be performed.

Q. HOW DOES AEP OHIO MONITOR AND EVALUATE THE PROGRESS AND COSTS OF THE PLAN?

A. AEP Ohio's Project Management Office provides oversight for all facets of the Plan, including development, project initiation, execution, monitoring, and closing of processes. This group evaluates progress, quality, adjustments, and costs, which provides transparency and accountability for all programs and projects in the Plan.

Q. HOW DOES AEP OHIO MONITOR THE DEVELOPMENT AND PROGRESS OF THE PLAN WITH RESPECT TO SYSTEM RELIABILITY PERFORMANCE?

A. The Company uses an Outage Management System to identify, respond to and record outage causes and other event details associated with sustained customer outages. Through analysis of the outage events over an extended period of time, AEP Ohio can identify solutions or process improvement programs to target the areas that are experiencing frequent outages or outages with long durations. By implementing the reliability programs supported by the DIR and ESRR and continuing to monitor outage events, the Company can determine if the programs are achieving the expected results.

A. ENHANCED SERVICE RELIABILITY RIDER ("ESRR")

Q. PLEASE SUMMARIZE THE COMPANY'S VEGETATION MANAGEMENT PROGRAM.

A. AEP Ohio has approximately 32,000 miles of primary voltage overhead distribution lines that require varying levels of vegetation (trees, brush, and vines) management. Since the

Commission approved the ESRR, the Company's cycle-based vegetation management program for trees inside ROW the Company has completed two full trim cycles. Systematic, whole system vegetation management programs are widely acknowledged by the industry as the most effective way to reduce the frequency and duration of vegetation-related outages. A reduction in vegetation-caused outages will prolong the life of equipment by reducing wear and tear and, in turn, reducing equipment maintenance, restoration, and replacement costs. AEP Ohio's vegetation management program has reduced outages by trees inside ROW by 79 percent, thereby improving customers' service:

- During 2010 – 2,700 outages caused by trees inside ROW.
- During 2019 – 580 outages caused by trees inside ROW.

The Company's experience shows that tree-related outages start to increase after four years without performing vegetation management on a cleared circuit due to the inability to maintain sufficient clearance of specific species of trees, such as silver maples. For this reason, AEP Ohio's cycle-based vegetation management program is specifically designed to be on a four-year cycle.

In addition, vegetation outside ROW has become the leading cause of reliability issues, and therefore, addressing danger trees is a priority in AEP Ohio's Distribution Work Plan. The Company began funding a Danger Tree Program in 2018 that targets dead, dying, diseased and leaning trees that could fall and cause service interruptions. The Danger Tree Program initially targeted hot spot areas based on visual inspections; however, AEP Ohio launched a performance-based clearance schedule in 2019 based on circuits with CMI caused by trees outside ROW. By 2021, the Company plans to have targeted every circuit that has CMI attributed to trees outside ROW. The Danger

Tree Program will then migrate to a systematic, cycle-based approach under the ESRR through incorporation into the trees inside ROW four-year trimming cycle.[7]

Detailed information concerning AEP Ohio's vegetation management program can be found in Exhibit TAK-3.

Q. IS AEP OHIO REQUESTING THE ENHANCED SERVICE RELIABILITY RIDER BE CONTINUED IN THIS DISTRIBUTION BASE CASE FILING?

A. Yes. In order to manage vegetation growth on the distribution system, AEP Ohio proposes to continue, with modifications, the existing ESRR. Company witness Moore discusses the modifications to the ESRR further in her testimony. The ESRR is expected to maintain the improvement in reliability due to reduced trees inside ROW-related interruptions and decrease outages due to trees outside ROW through integration of the Danger Tree Program into the systematic 4-year trimming cycle.

Q. HOW DOES THE COMPANY DETERMINE THAT VEGETATION NEEDS TO BE REMOVED FROM INSIDE THE ROW?

A. All areas designated for vegetation management activities inside the ROW are inspected by a qualified work planner before a work assignment for those areas is issued to the vegetation crews. AEP Ohio employs forestry work planners who are trained to evaluate trees inside the ROW and make customer contacts regarding the necessary work. During this inspection, a planner will evaluate each tree relative to its species, growth rate, proximity to the overhead conductor, risk of it causing an interruption, and other outage or

[7] The Danger Tree Program costs have been tracked and recovered as a component of the DIR since its inception in 2018. In the 2020 DIR Work Plan, filed in Case No. 19-2100-EL-RDR, the program projected $47.5 million in direct capital costs. AEP Ohio is requesting to move the Danger Tree Program under the ESRR in 2021 as it migrates from a performance-based clearance schedule to a cycle-based approach through incorporation into the trees inside of ROW program's four-year trimming cycle.

safety concerns. The objective of this evaluation is to have a clear 30-foot wide ROW that is free of trees inside the ROW and overhang to limit exposure to vegetation potentially coming into contact with the Company's power lines.

Q. HOW DOES THE COMPANY DETERMINE THAT VEGETATION NEEDS TO BE REMOVED FROM OUTSIDE THE ROW?

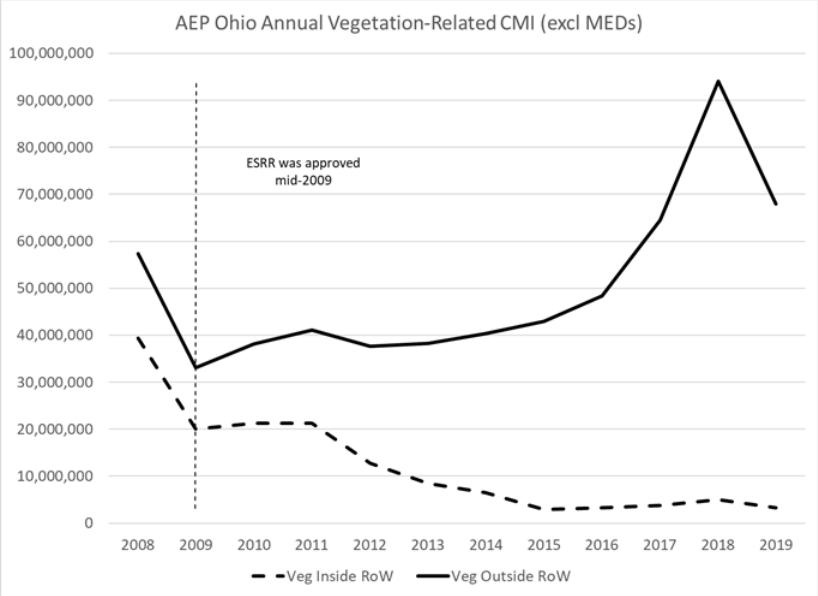
A. While performing work on a circuit, including circuit inspection, AEP Ohio field personnel conduct a visual assessment to identify danger trees outside the ROW. As defined in the Joint Stipulation and Recommendation filed in Case Nos. 17-38-EL-RDR and 18-230-EL-RDR, a danger tree is a tree that is structurally unsound and could strike the power lines when it falls. Danger tree characteristics include dead branches or trunks, leaning, uprooting, fungus, and/or signs of decay. If a tree has been identified as a danger tree, that information is recorded and reported to the Company's forestry personnel, who will manage and schedule the danger tree's removal or trimming.[8] Danger tree mitigation is performed during both cycle-based trimming and through the Company's Danger Tree Program.

Q. HAS AEP OHIO'S INCREASED VEGETATION MANAGEMENT ACTIVITY BENEFITTED CUSTOMERS AND THE COMPANY?

A. Yes. Increased vegetation management activity since the initiation of the ESRR in the 2008-2010 time period has led to reductions in trees inside ROW-caused outages, resulting in improved reliability and service to customers. As Figure TAK-8 demonstrates, there has been a decline in the number of tree-related outages since the ESRR's initiation.

[8] The danger tree information recorded and reported includes the tree's location, which may be identified by address, street or road name, circuit number, and pole number.

Figure TAK-8



Q. WHAT ARE AEP OHIO'S PLANNED VEGETATION MANAGEMENT COSTS REFLECTED IN THIS PROCEEDING?

A. Funding for the vegetation management program, as shown in Figure TAK-9, is required to maintain the four-year trimming cycle and complete the conversion of the Danger Tree Program from a performance-based approach to a cycle-based approach.

Figure TAK-9 – Enhanced Service Reliability Plan ($000)

Period	2021	2022	2023	2024	Total
Total Expenditures	102,838	94,123	94,123	94,123	**385,205**

The Company is also proposing the removal of the O&M spend cap in order to maintain flexibility. Over time, AEP Ohio will need to be able to respond to emergent weather or situations and changes in equipment and labor costs. Due to other utilities in the Midwest region being similarly situated, there is a high demand for local crews and business partners to complete this work, which has resulted in labor and equipment costs increasing by approximately 26 percent from 2016 to 2019.

The ESRR mechanism and associated accounting treatment is further discussed by Company witness Moore.

B. DISTRIBUTION INVESTMENT RIDER ("DIR")

Q. PLEASE DESCRIBE THE DISTRIBUTION INVESTMENT RIDER.

A. The DIR facilitates and encourages investments to maintain and improve distribution safety and reliability, align customer expectations and the expectations of the distribution utility, as well as streamline recovery of the associated costs, and reduce the frequency of base distribution rate cases. This allows AEP Ohio the ability to meet customer demand to maintain and improve the reliability of its distribution system as well as effectively modernize and proactively harden the Company's system infrastructure.

As part of the approval of the DIR, AEP Ohio must file an annual DIR Work Plan, which provides estimates of the work to be proactively performed through the DIR programs and the expected spending in each category for the following year. In order to develop the annual DIR Work Plan, the Company looks at the causes of outages on the system, opportunities for proactive replacement, engineering and labor resource availability, and the overall impact of each program. Under the 2019 DIR Work Plan, the Company saw the following reliability improvements:

Figure TAK-10 – 2019 DIR Work Plan Reliability

Reduction in Number of Outages	Reduction in Outages Minutes	Number of Outages Avoided
449	29,400	11,988 (less Trees outside ROW)

Additionally, due to the Danger Tree Program for trees outside ROW, 154,196 danger trees were removed. AEP Ohio's current 2020 DIR Work Plan, filed in Case No. 19-2100-EL-RDR, and the 2019 DIR Work Plan Reliability Report contains additional

details pertaining to the work to be proactively performed under the DIR and associated reliability impacts.

Q. IS AEP OHIO REQUESTING THE DISTRIBUTION INVESTMENT RIDER BE CONTINUED IN THIS DISTRIBUTION BASE CASE FILING?

A. Yes. In order support the Company's asset renewal, distribution capacity and infrastructure improvements, AEP Ohio proposes to continue, with modifications, the existing DIR. The DIR is expected to maintain and improve customer service and reliability through the continuance of its proactive asset inspection, maintenance, and replacement programs.

The DIR's proposed revenue caps for 2021 – 2024 are based on the DIR Work Plan components and associated operations, which are discussed below and in Exhibits TAK-2 and TAK-3. AEP Ohio's proposed revenue caps for the DIR are described further by Company witness Moore.

Q. PLEASE SUMMARIZE THE MAJOR PROGRAMS UNDER AEP OHIO'S DISTRIBUTION INVESTMENT RIDER.

A. AEP Ohio's Asset Renewal and Reliability Programs are a suite of programs developed to replace aging infrastructure and harden the distribution system to improve reliability and resiliency. AEP Ohio's asset renewal and reliability programs allow the Company to systematically and proactively address these risks to reliability, resiliency, and safety. Alternatively, if the Company were to take a pure run-to-failure approach, AEP Ohio would experience more asset failures, the quality of service to customers would unnecessarily suffer, and there would be an increased probability of public and employee exposure to safety risks.

Each year AEP Ohio completes various distribution projects, termed "major projects," that are not included in the asset renewal and reliability programs or risk mitigation categories. These projects are necessary to address capacity and contingency capacity constraints (i.e., the ability to serve customers from another location, thereby reducing the length of an outage), to improve outage recovery, to replace or upgrade aging or obsolete station equipment, to implement supervisory control and data acquisition ("SCADA"), and to perform voltage conversions of select stations and distribution circuits.

AEP Ohio has also developed risk mitigation programs to improve public safety. The risk mitigation programs are intended to identify and remediate assets that, due to age or condition, present a potential safety risk to the public or employees. Furthermore, the Company's inspection programs provide a systematic approach to identifying potential system issues and reducing the probability and consequences of asset failures. As AEP Ohio's system ages and the potential for asset failures increases, a targeted risk program is necessary to provide the greatest margin for public and employee safety. The results of the inspections directly drive the asset renewal and reliability programs discussed above.

Detailed information concerning AEP Ohio's asset renewal and reliability programs, distribution major projects, and risk mitigations programs can be found in Exhibits TAK-2 and TAK-3.

Q. PLEASE IDENTIFY THE TYPES OF DISTRIBUTION PROJECTS ASSOCIATED WITH TRANSMISSION WORK THAT ARE RECOVERED THROUGH THE DISTRIBUTION INVESTMENT RIDER.

A. Distribution projects associated with transmission work are projects managed by Transmission and include expenditures charged to distribution FERC accounts. These distribution projects fall into two broad categories:

1. Distribution upgrades that are necessary to complete transmission projects; and
2. Distribution asset improvements where it is cost effective and efficient to complete identified distribution work at the same time as completing a transmission project on or near distribution facilities in the same area.

The first broad category of distribution projects occurs when distribution work is mandatory to complete the transmission project, and can come in the form of the necessary transfer or replacement in kind of existing distribution conductors installed on transmission lines being rebuilt or the conversion of a 69 kV line to 138 kV to address a transmission criteria violation that will require the distribution substation to be upgraded to 138 kV. Expenditures for distribution projects under the second broad category include standalone distribution projects that utilize transmission resources (*i.e.*, Station Animal Mitigation, Station Regulator Replacements, Station Breaker Replacements, Station Rehabilitation) as well as specific distribution asset improvement and renewal projects (*i.e.*, labor associated with upgrading distribution circuits attached to transmission lines during a line rebuild) that are identified and tracked in the DIR Work Plan.

Notably, all of the expenditures described by categories one and two above are recovered through the DIR because they are distribution assets. I will address the second

broad category of distribution projects in more detail below. Company witness Ali describes and supports the first category.

Q. CAN YOU FURTHER DESCRIBE THE SECOND CATEGORY OF DISTRIBUTION PROJECTS ASSOCIATED WITH TRANSMISSION WORK?

A. Transmission plans to rebuild a number of transmission lines of which a portion contain distribution underbuild. The necessary transfer of distribution facilities or the replacement of conductors with "like kind" are included with these transmission projects. Distribution asset improvement projects associated with transmission work provide Distribution the opportunity to make distribution system enhancements, such as building a new tie line or increasing conductor size to create a tie line for reliability purposes. Transmission will also be rebuilding existing or building new station facilities.[9] The replacement of distribution station breakers and transformers, distribution SCADA installations, and relocation or replacement of distribution feeder exits in conjunction with these transmissions projects is also included in this broad category of distribution projects as either reliability enhancements and/or asset renewal. As described earlier in my testimony, proactive asset renewal reduces the probability of future customer outages. In some cases, new tie lines may be established to enhance reliability and shorten outage durations following an event. A portion of the circuit that is rebuilt will replace existing equipment identified to be near the end of its life that could reduce future equipment failure outages.

Additional information regarding the second category of distribution projects associated with transmission work can be found in Exhibits TAK-2 and TAK-3.

[9] Some substation facilities solely house distribution equipment, while other substations contain both transmission and distribution assets to provide their respective services.

Q. PLEASE DESCRIBE CAPITAL SPARES AND THEIR OPERATIONAL NEED.

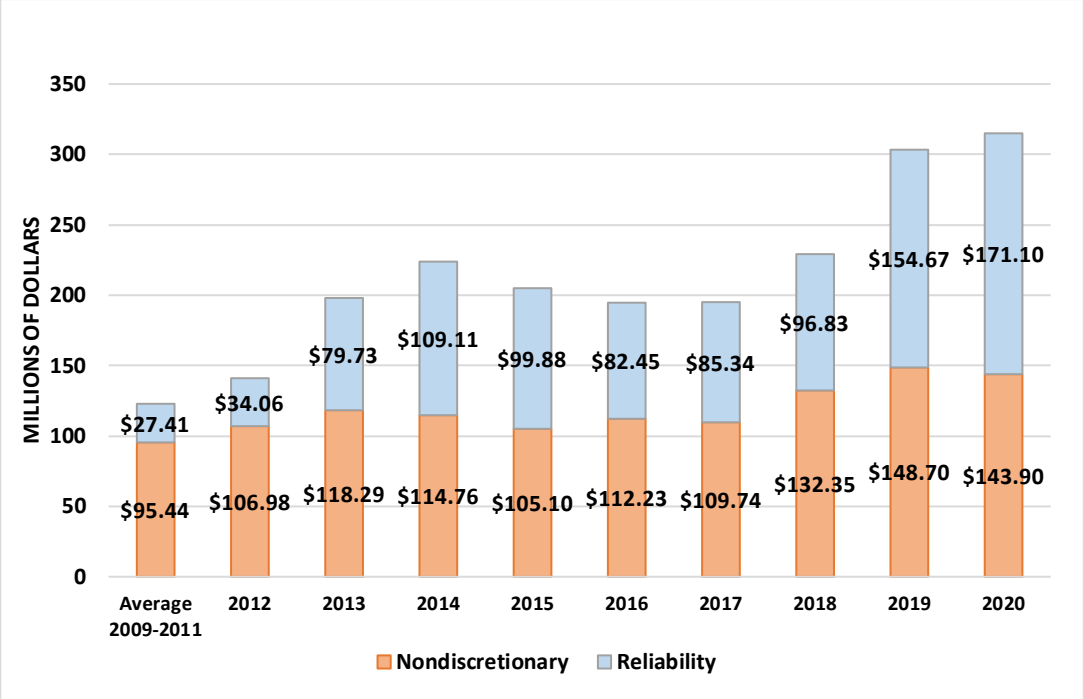
A. AEP Ohio's capital spare parts program maintains an inventory of power transformers, mobile transformers and skid stations based on the asset's failure rate and a statistical probability analysis in order to manage the long lead time of the procurement cycle for these system-critical assets to maintain customer reliability. Without these capital spares, there is the possibility of extended outages and high costs associated with buying or renting these assets from another local utility when an equipment failure occurs. These components are capitalized at receipt and placed in service in response to both planned and emergency installations due to equipment failures. The program expenditures may vary significantly year to year due to the specific equipment purchased and deployed in any given year. Company witness Ali describes in greater detail the types and amounts of capital spares maintained through the capital spares program, as well as the need for, typical use of, and benefits associated with capital sparing.

Q. ARE CAPITAL EXPENDITURES RECOVERED THROUGH THE DIR FOR RELIABILITY-BASED PROJECTS AND PROGRAMS ONLY?

A. No. Capital expenditures recovered through the DIR are not all reliability-based but also include mandatory or nondiscretionary work, such as the integration of new residential and commercial customers, external requests, capacity, outage restoration, and public project relocations ("PPRs").[10] Figure TAK-11 compares the 2009-2011 baseline reliability versus nondiscretionary spending as compared to each of the other years for the DIR Work Plan.

[10] PPR projects involve the relocation of distribution facilities in or near public road ROW to accommodate projects such as road construction, water and sewer line installation, and sidewalk construction.

Figure TAK-11 – AEP Ohio DIR Expenditure Trend[11]



The above figure demonstrates that the capital investments completed as part of the DIR for reliability-based programs and projects represents an average of only 45.6 percent of the Company's overall distribution plant investment over the last five years. Therefore, more than half of capital expenditures under the DIR are required to go towards this customer-driven, nondiscretionary work rather than to improve customer reliability. However, AEP Ohio's Distribution Work Plan includes additional reliability driven-work to help address the primary contributors to CMI.

Q. WHAT RELIABILITY IMPROVEMENTS DOES THE COMPANY ANTICIPATE FROM IMPLEMENTATION OF ITS DISTRIBUTION WORK PLAN?

A. AEP Ohio has several ongoing work plans that address SAIDI in the Distribution Work

[11] The DIR capital spend depicted in Figure TAK-11 is in direct dollars rather than post-allocated costs. While the other values discussed in my testimony are provided in post-allocated dollar amounts, the DIR expenditure trend is shown in direct dollars due to AEP Ohio having historically provided capital investment values in the annual DIR Work Plan in this format.

Plan. From 2020 to 2024, the Company predicts that our work plans will avoid over 18,000 outages due to asset improvement work being performed on the distribution system and will reduce an additional 2,900 outages due to circuit inspection and repair work. The Company's Danger Tree Program will have addressed every circuit that has had an outage caused by trees outside ROW by the end of 2020 and will align with the ESRR cycle trim plan 2021-2024 to address every circuit in AEP Ohio's service territory. From that alignment the Company predicts the SAIDI contribution from trees outside ROW to drop to 29.8 minutes by the end of 2024 at the proposed spend levels, resulting in a SAIDI improvement of 53%. Also, many of the major projects will have a station component that will improve area outage recovery abilities which will help to reduce customer outage duration and enhance the customer experience.

VIII. DISTRIBUTION CAPITAL EXPENDITURES

Q. WHAT FORECASTED CAPITAL EXPENDITURES ARE YOU SUPPORTING IN THIS PROCEEDING?

A. I am supporting the distribution capital expenditures during AEP Ohio's Distribution Plan from January 1, 2021 through December 31, 2024. This four-year period commences after the date certain and continues beyond the end of the Test Year.

Q. HOW IS THE TOTAL AMOUNT OF FORECASTED CAPITAL EXPENDITURES TO BE MADE IN AEP OHIO'S DISTRIBUTION SYSTEM DETERMINED?

A. AEP Ohio has reviewed its distribution system in order to determine the level of work that needs to be completed, including AEP Ohio's Distribution Work Plan, in order to maintain the integrity of AEP Ohio's system and provide safe and reliable service.

Projects are based on sound engineering plans, and AEP Ohio's cost estimates are derived from Company experience and proven, effective methods. AEP Ohio's forecasting process is described further by Company witness Kelso.

Q. PLEASE DESCRIBE THE MAJOR CATEGORIES OF DISTRIBUTION INVESTMENTS.

A. Figure TAK-12 shows total Company distribution capital expenditures during AEP Ohio's Distribution Work Plan from January 1, 2021 through December 31, 2024:

Figure TAK-12 – AEP Ohio Distribution Capital Expenditures ($000)[12]

Program	2021 Capital Expenditures	2022 Capital Expenditures	2023 Capital Expenditures	2024 Capital Expenditures	2021-2024 Total Capital Expenditures
Major Projects	58,976	31,718	32,628	33,050	**156,372**
Customer Service, Transformers, Meters, Make Ready, Public Project Relocations & Restoration	94,164	97,471	99,440	102,738	**393,814**
Inspection Programs	14,104	14,424	14,628	14,987	**58,142**
Vegetation Management[13]	16,600	0	0	0	**16,600**
Asset Renewal and Reliability	196,357	233,400	260,465	290,984	**981,206**
Totals	**380,201**	**377,013**	**407,161**	**441,759**	**1,606,135**

Figure TAK-12 reflects distribution capital investment associated with the DIR and ESRR. Capital expenditures related to asset renewal and reliability and major projects, are described in connection with the Plan above. Capital expenditures for Customer, City and

[12] Figure TAK-12 presents AEP Ohio's 2020 control budget/long-range plan, and is subject to future review and changes. Historically, AEP Ohio has provided capital investment values in direct dollars. These values are now being presented in post-allocated costs, which include labor costs. Accordingly, the Company is not asking for a substantial increase in additional capital spend, but rather is presenting its distribution capital investment values in a fully loaded cost format.

[13] The Joint Stipulation and Recommendation filed in Case Nos. 17-38-EL-RDR and 18-230-EL-RDR (DIR Audit proceedings), provided that AEP Ohio would start expensing inside and outside ROW tree removals starting with the new base rates becoming effective after the upcoming AIR case (*i.e.*, this case). Accordingly, in Figure TAK-12, capital costs associated with tree removals goes to zero starting on July 1, 2021. The amount shown in year 2021 is based on a $30 million annual amount with the assumption that rates go into effect on July 1, 2020.

State Requirements, and Other relate to nondiscretionary work associated with the integration of service to new residential and commercial customers, including the necessary transformers and meters, as well as outage restoration.

Q. DO THE COMPANY'S FORECASTED DISTRIBUTION CAPITAL EXPENDITURES REFLECT THE DISTRIBUTION INVESTMENT NECESSARY TO PROVIDE SAFE AND RELIABLE SERVICE?

A. Yes, the forecasted distribution capital expenditures are representative of distribution service activities that are necessary to service AEP Ohio's customer base. Several factors affect the capital investment levels that are incurred by AEP Ohio. These include many of the same factors that also affect O&M. For example, as previously mentioned, AEP Ohio is experiencing an increasing failure rate of distribution equipment due to an aging infrastructure. In order to mitigate this trend, and to proactively replace distribution equipment at risk of failing, AEP Ohio must expend capital on its distribution system to maintain reliability.

Q. ARE THE COMPANY'S FORECASTED DISTRIBUTION CAPITAL EXPENDITURES REASONABLE?

A. Yes. The capital projects projected for the Distribution Work Plan period from January 1, 2021 through December 31, 2024 represent planned distribution expenditures. Although AEP Ohio has the ability to prioritize capital dollars on an as-needed basis as circumstances warrant, the overall projected level of capital expenditures is reasonable and accurate.

IX. DISTRIBUTION OPERATIONS & MAINTENANCE EXPENSES

Q. WHAT O&M EXPENSES ARE YOU SUPPORTING IN THIS PROCEEDING?

A. I am sponsoring the AEP Ohio Distribution Work Plan, which includes Test Year O&M

expenses. I participate in the prioritization and allocation of AEP Ohio's O&M expenses based on work plan development.

Q. WHAT IS THE TEST YEAR LEVEL OF DISTRIBUTION O&M EXPENSE THAT YOU ARE SUPPORTING IN THIS FILING?

A. I am supporting the Company's Test Year distribution O&M expense of $137.4 million (net of adjustments).

Q. WHAT ARE THE MAJOR AREAS OF DISTRIBUTION O&M EXPENSE?

A. There are three main categories of distribution O&M expense:

- *Ongoing O&M* – The largest portion of distribution O&M expense is Ongoing O&M, which includes expenses such as labor, fringe benefits, fleet vehicles, contractors, materials, and other expenses incurred in the general supervision, direction, planning, coordination and training in connection with the operation and maintenance of the distribution system.
- *Vegetation Management O&M* – This expense relates to vegetation management, such as maintenance tree trimming inside the ROW and addressing danger trees outside the ROW, on AEP Ohio's distribution system.
- *Major Storm O&M* – This expense relates to large storms that qualify as Major Storm events. I describe this category further below.

Q. PLEASE PROVIDE THE TEST YEAR DISTRIBUTION O&M EXPENSE BY CATEGORY.

A. Figure TAK-13 provides the Test Year distribution O&M expense (net of adjustments) by category:

Figure TAK-13 – AEP Ohio Test Year Distribution O&M Expenses ($000)

Category	Test Year O&M Expense
Ongoing O&M	$111,938
Vegetation Management	$22,107
Major Storms	$3,567[14]
Total	**$137,612**

AEP Ohio's vegetation management and major storms O&M expense are described further by Company witness Moore, and AEP Ohio's ongoing distribution O&M expense is described further by Company witness Kelso.

Q. IS THE TEST YEAR LEVEL OF DISTRIBUTION O&M EXPENSE REFLECTED IN THE COMPANY'S FILING REPRESENTATIVE OF THE DISTRIBUTION O&M EXPENSE NECESSARY TO PROVIDE ONGOING SAFE AND RELIABLE SERVICE?

A. Yes, the Test Year level of O&M expense is representative of distribution service activities that are necessary to serve AEP Ohio's customer base and maintain the reliability of AEP Ohio's distribution system. The distribution O&M expense in the Test Year is reasonable.

X. STORM DAMAGE RECOVERY RIDER ("SDRR")

Q. PLEASE EXPLAIN THE MAJOR STORM O&M CATEGORY.

A. Major Storms are classified as a period of time when the electricity delivery system is faced with challenges beyond its normal design criteria. As previously mentioned, the term "Major Storm" is based on the methodology outlined in IEEE Standard 1366.

[14] This amount is inconsistent with the Major Storms baseline amount referenced below under Section X. "Storm Damage Recovery Rider" due to the inclusion of December actuals in the Test Year.

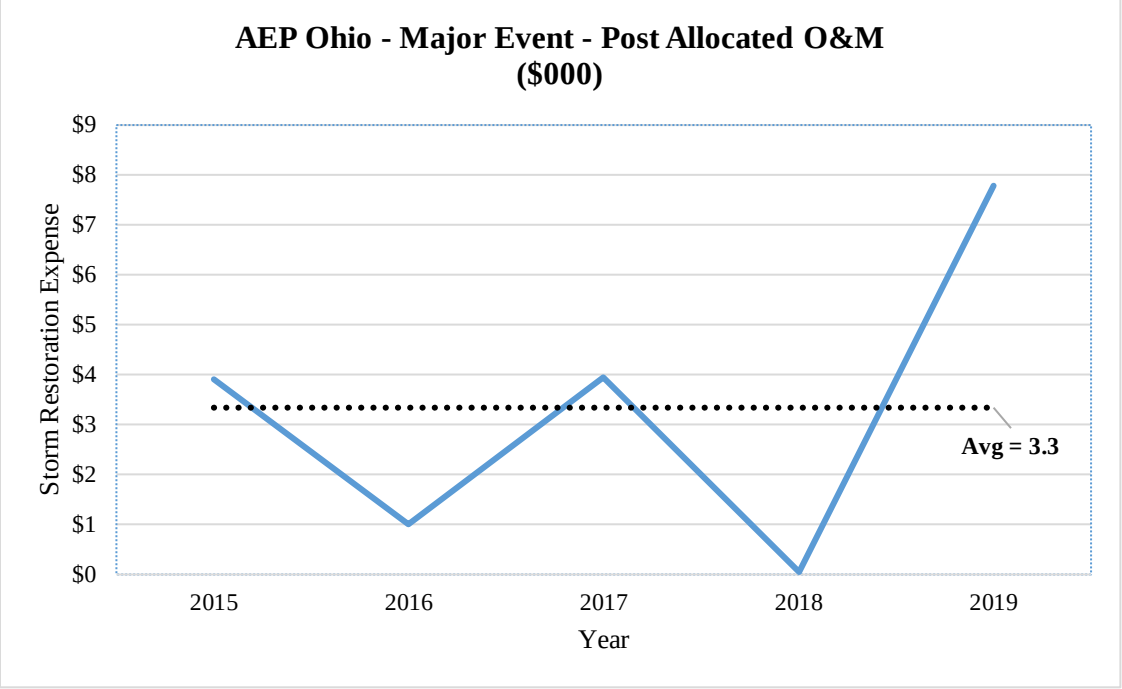
Q. HOW OFTEN DOES AEP OHIO'S DISTRIBUTION SYSTEM EXPERIENCE MAJOR STORMS?

A. Since 2014, AEP Ohio's service territory has on average experienced 3-4 major events each year, which have ranged in cost from approximately $50 thousand to $9.4 million annually.

Q. PLEASE DESCRIBE AEP OHIO'S REQUEST FOR CONTINUATION OF THE STORM DAMAGE RECOVERY RIDER.

A. Given the volatility of major storms and major storm damage restoration O&M expenses from year to year, AEP Ohio is proposing the continuation of the Storm Damage Recovery Rider ("SDRR") with a base amount of $3.341 million.[15] See Figure TAK-14 for the five-year historic expenses for Major Storm by year.

Figure TAK-14



[15] This base amount is further discussed by Company witness Moore in her testimony.

This mechanism is necessary to preserve forecasted O&M for planned maintenance activities. If funds are constantly diverted to cover the expense of Major Storms, it disrupts the completion of planned maintenance and ultimately has an impact on the reliability of the system. This mechanism is further discussed by Company witness Moore.

Q. WHAT AMOUNT IS INCLUDED IN AEP OHIO'S TEST YEAR O&M EXPENSE RELATED TO MAJOR STORMS?

A. Based on AEP Ohio's experience managing its distribution system, AEP Ohio has included approximately $3.6 million in its Test Year distribution O&M expense for Major Storms.

Q. IS THE MAJOR STORM EXPENSE INCLUDED IN AEP OHIO'S TEST YEAR REASONABLE?

A. Yes. Storm costs are random and unpredictable events that can vary in size and impact, causing Major Storm expenses to be volatile from one year to the next. Without this level of Major Storm expense, AEP Ohio may need to forego necessary non-storm O&M activities in order to fund Major Storm restoration activities, which could lead to a gradual degradation of the system and negatively impact service reliability. The level of Test Year Major Storm expense is approximately at the midpoint of the range AEP Ohio has experienced in the past and is a reasonable estimate of the expense that AEP Ohio may incur in any year.

Q. DOES THE STORM DAMAGE RECOVERY RIDER INCLUDE CAPITAL COSTS INCURRED AS A RESULT OF A MAJOR STORM?

A. No. Capital costs would become a component of the DIR or of the rate base in the next

general rate proceeding.

XI. CONCLUSION

Q. DOES THIS CONCLUDE YOUR TESTIMONY?

A. Yes.

Ohio Power Company
Case No. 20-0585-EL-AIR
Exhibit TAK-1
Page 1 of 1

AEP OHIO℠

An AEP Company

BOUNDLESS ENERGY℠

2019

LEGEND

- DISTRIBUTION STATION
- DISTRICT OFFICE
- LINE SERVICE CENTER

WESTERN OHIO DISTRICT

COLUMBUS DISTRICT

CHILLICOTHE DISTRICT

NEWARK DISTRICT

CANTON DISTRICT

ATHENS DISTRICT

DOWNTOWN CANTON STATIONS
SCHROYER
CRYSTAL PARK
PIEDMONT
THIRD ST
CHERRY AVE
SAVANNAH AVE

LAST UPDATED January 18, 2019

AEP Ohio DIR Work Plan Components

DIR Component	Program Description	Measures for Reliability Improvements	Equipment Affected	Measurement Units
	Section A – Reliability			
Distribution Circuit Asset Improvement Includes Small Wire Replacement	This program is designed to address various operational, reliability and asset renewal issues as identified by Distribution Line Operations, Distribution Engineering and customer concerns. This program includes circuit improvement projects such as line relocation, reconductoring, OH to UG, multiphasing, fuse size changes, over current protection upgrades and coordination, circuit reconfiguration, and load balancing. The Small wire replacement portion of this will proactively address equipment failure issues by replacing targeted spans of small and deteriorating overhead conductor. In some cases portions of circuits may be relocated and/or rebuilt due to accessibility concerns and/or physical conditions.	Reliability improvements vary based on the type of work performed and can be measured on a circuit or line segment basis. The small wire replacement work should reduce outages due to Equipment/Hardware and conductor failure by fifty percent on those line segments addressed beginning in the year following installation. Projects such as line relocation and reconductoring segments should reduce outages due to Equipment/Hardware and conductor failure by fifty percent on those line segments addressed beginning in the year following installation. Load balancing when completed on a circuit will reduce overload outages by fifty percent beginning the following year after installation. Projects which take overhead lines to underground lines will reduce weather related outages, animal outages, and tree related outages on those segments by fifty percent in the year following when work was completed. Upgrading of overcurrent protection devices (changing from hydraulic to electronic protection devices, changing from three phase to single phase isolation and fuse size and coordination changes) can reduce customer outages by impacting fewer customers affected by an outage. Some projects under this program are solely asset renewal projects with only minor reliability impact related to the prevention of future outages, but are intended for proactive equipment replacement.		Completed Hours
Cutout & Arrester Program	This program is to proactively address equipment failure issues by replacing targeted porcelain cutouts and associated equipment. Approximately 2,150 cutouts and their associated arresters are targeted for replacement under this program in 2020.	Proactive asset renewal that will reduce the probability of future outages related to cutout and arrester failures.	Cutouts and arrestors	Units Installed
Animal Mitigation - Station	This program is designed to install electric fences in targeted stations to help mitigate against animal related outages. Approximately 5 electric fences may be targeted in 2020 for work under this station animal mitigation program.	This should reduce non-avian related animal caused outages inside distribution stations by approximately fifty percent for those stations where mitigation was installed beginning in the year following installation.	Station transformers, breakers, regulators, insulators, etc.	Fences Installed
Lightning Mitigation	This program is designed to help reduce the number of lightning caused outages on identified circuits. AEP Ohio will review circuits by lightning caused outages and install lightning mitigation where needed. These circuits will be reviewed on an annual basis and may include that year's Rule 11 circuits. Circuits may be added or removed at the Company's discretion. This program will involve 2 circuits in 2020.	This should reduce the aggregate number of lightning caused outages by approximately fifty percent on the circuits addressed beginning in the year following installation.	Arrestors	Circuits
Underground Cable Rehab	This program is to proactively address aging infrastructure based on various factors such as age, previous operational history, cable construction, etc. This would include URD cable, feeder exit cable, network cable, and station cable, such as transformer cables and bus ties. This program will include approximately 850,000 conductor feet of underground cable work in 2020.	This should reduce URD cable failures by approximately fifty percent on those segments addressed beginning in the year following installation. Feeder exit, network and station cable replacements are asset renewal programs and as such, there will be some positive impact to reliability, related to the prevention of future outages.	Underground Cable, Conduits, Duct Banks, Live Front and other Transformers, Switches, Pedestals, etc.	Live Front and other Transformers, Switches, Pedestals, etc. Span Feet
OVHD Circuit Inspection Repair Program	This program is designed to visually inspect overhead line facilities and to make the appropriate repairs or replacements (asset renewal) when issues are found. Circuits are inspected at least once every five years. Approximately 400 circuits are targeted for inspection in 2020.	This should reduce equipment caused outages by thirty percent on those circuits addressed beginning in the year following installation.	Conductor, poles, crossarms, insulators, cutouts, arrestors, etc.	Completed Work Packets
Station Breaker Replacement	This program is designed to replace existing distribution station breakers with associated relays, controls, and SCADA when appropriate. AEP Ohio will target equipment which is	Proactive asset renewal program. There is positive impact to reliability, related to the prevention of future station breaker outages.	SCADA, Station Breakers	Units Installed, Installations

AEP Ohio DIR Work Plan Components

	approaching end of life and becoming difficult to maintain. The existing breakers have limited flexibility to adapt to modern over current protective schemes. Approximately 8 station breakers are targeted in 2020 for work under this station breaker program.			
Distribution Asset Improvement Associated with Transmission Work	AEP Transco plans to rebuild a number of transmission lines of which a portion contain Distribution underbuild. Transfer of Distribution facilities or the replacement of conductors with "like kind" are included with the Transmission project. This component will provide Distribution the opportunity to make Distribution system enhancements, such as building a new tie line or increasing conductor size to create a tie line for reliability purposes. AEP Transco/Transmission will also be rebuilding existing or building new station facilities. The replacement of Distribution station breakers and transformers, Distribution SCADA installations, and relocation or replacement of Distribution feeder exits in conjunction with these projects will also be included in this component as either reliability enhancements and/or asset renewal. (This does not include breaker or underground cable replacement or SCADA installations).	Proactive asset renewal that will reduce the probability of future outages. In some cases, new tie lines may be established to enhance reliability to shorten outage durations following an event. A portion of the circuit that is rebuilt will replace existing equipment identified to be near the end of its life that could reduce future Equipment Failure outages.	Conductor, poles, crossarms, insulators, cutouts, arrestors, riser assemblies, Station Breakers, Regulators, Transformers, Underground Cable, etc.	Completed Hours
Pole Replacement	This is an asset renewal program. The primary objective of this program is to maintain the mechanical integrity of our wood pole infrastructure necessary for the safety of employees and the public under the conditions specified in the NESC. Approximately 5,000 poles are targeted in 2020.	Proactive asset renewal program. There is positive impact to reliability, related to the prevention of future outages due to pole failures.	Poles	Poles Replaced
Line Reclosers Maintenance	This is an asset renewal program. Approximately 650 reclosers are targeted in 2020.	Proactive asset renewal program. There is positive impact to reliability, related to the prevention of future outages due to recloser failures. There is also an opportunity to enhance the over current protection scheme on the circuit.	Reclosers	Units Installed
Sectionalizing	This program is designed to enhance the over current protection scheme, operation of Distribution system and reduce the number of customers affected by an outage. It includes the installation/upgrade of sectionalizing devices on circuits, shortening of protection zones and providing additional isolation points. Approximately 20 circuits will be targeted in 2020 for work under this sectionalizing program.	Installation of sectionalizing can reduce SAIFI by impacting fewer customers affected by an outage. There is limited opportunity to continue with a large scale effort.	Reclosers, Sectionalizers, Cutouts	Circuits
URD Remediation Program	This program is designed to provide a visual public safety inspection of pad mount transformers, switchgear, primary enclosures and secondary pedestals. Each piece of equipment is inspected once every 5 years. Approximately 44,000 units are targeted for inspection in 2020. Repair work is a subset of previously inspected units.	The majority of this work is proactive asset renewal that will reduce the probability of future outages related to pad mounted URD equipment. This is an inspection program used to identify unsafe conditions.	Pad mount transformers, switch cabinets, pedestals	Completed Work Packets
Network Rehab	This program is designed to replace and/or upgrade network cable, vaults, transformers, protectors and install fault indicators.	Proactive asset renewal program. There is positive impact to reliability, related to the prevention of future network outages.	Network transformers, protectors, vaults, manholes, cable, switches, etc.	Completed Hours
Station Regulator Replacements	This program is designed to replace existing distribution station regulators and associated controls. AEP Ohio will target equipment which is approaching end of life and becoming difficult to maintain. 4 station regulators are targeted in 2020.	Proactive asset renewal program. There is positive impact to reliability, related to the prevention of future station regulator outages.	Station Regulators	Units Installed

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Targeted Danger trees	Danger trees are a growing cause of outages. This program will identify trees that pose a hazard to our distribution lines or equipment from outside the right-of way and then work with property owners to allow us the remove them. Trees that are dead, dying, or leaning toward our lines are the general target of this program. Approximately 140,000 trees will be removed in 2020.	This is a proactive preventative program. There is some reliability impact related to the prevention of future outages.		Trees Removed
Pole Reinforcement	This is an asset life extension program. The primary objective of this program is to maintain the mechanical integrity of our wood pole infrastructure necessary for the safety of employees and the public under the conditions specified in the NESC. 150 poles are currently targeted in 2020.	Proactive asset renewal program. There is positive impact to reliability, related to the prevention of future outages due to pole failures.	Poles	Pole Locations
Underground Duct and Manhole Facilities Rehab	This program is designed to inspect and replace non-network underground duct, manhole and associated cable facilities. This program will identify unsafe conditions and correct deficiencies necessary for the safety of employees and the public under the conditions specified in the NESC.	Proactive asset renewal program. There is positive impact to reliability, related to the prevention of future underground duct and manhole related outages.	Underground vaults, manholes, cable, switches, etc.	Completed Hours
Station Rebuild / Rehab	This program is designed to replace existing distribution station equipment including transformers, breakers, structures underground facilities, etc. AEP Ohio will target equipment which is approaching end of life and becoming difficult to maintain.	Proactive asset renewal program. There is positive impact to reliability, related to the prevention of future station equipment caused outages.	Station transformers, breakers, regulators, insulators, structures, underground facilities, etc.	Stations
	Section B - Nondiscretionary			
Network Capacity	Network transformers, protectors, vaults, manholes, cable, switches, etc.	There is no reliability impact.	Network transformers, protectors, vaults, manholes, cable, switches, etc.	
Capacity Additions	This program is designed to install new Distribution station and line capacity to serve additional load.	There is no reliability impact.		
Integrated Volt Var Systems	This program provides improved efficiency through voltage optimization. The program's primary focus is to reduce electrical demand and/or accomplish energy conservation.	There is no reliability impact.		
Customer Service Work	This component is for work necessary for providing customers electric service in AEP Ohio. It includes capital dollars for providing service to new customers, as well as upgrades to existing commercial, industrial and residential customers.	There is no reliability impact.		
Third Party Work Request	This component involves work requested by a third party. This includes work for customer requested relocates, damage claims made by outside parties, and make ready work which includes replacing AEP Ohio owned poles for others who are attached or propose to attach to AEP Ohio owned poles.	There is no reliability impact.		
Public Project Relocation	This component involves work requested by a governmental entity such as a township, city, or the state. Public projects generally consist of work associated with road improvement projects which benefit the public. This involves the capital work AEP Ohio does to accommodate these governmental improvement projects within the service territory.	There is no reliability impact.		
Service Restoration	This component includes day to day work for service restorations which are excluded from the major event category of outages. This would include capital dollars for such things as equipment	There is no reliability impact.		

AEP Ohio DIR Work Plan Components

	replacement from an outage and capital dollars associated with minor storm events.			
Forestry		The reliability impact regarding this program is reflected as an adjustment in the current standards and proposed reliability standards.		
Transformer Blanket	This component is for the purchase of Distribution line transformers necessary for providing customers electric service in AEP Ohio. It includes overhead line transformers and pad mounted transformers.	There is no reliability impact.		
Engineering & Field Line	This component includes Engineering labor, Fleet and Material & supplies.	There is no reliability impact.		
Customer Meter Blanket		There is no reliability impact.		
Reveue / Reimbursments	This component includes AEP Ohio items which are involved in day to day work components of service to customers. This would include revenue credits and contribution in aid to construction credits.	There is no reliability impact.		
Other		There is no reliability impact.		

AEP Ohio 2021 Distribution Work Plan Project Detail

Program	Category	Project Ranking	Station/Circuit	Description	Units	UOM	Program Total	Est Capital Cost
1 Ph OH Line rebuild or relocate	Reliability "F"	36	7401204	Rebuild 0.1 miles on circuit 7401204	0.10	miles		
DROHREBA1		141	7108501	Relocate single phase conductor to the road along Desert Road SW. There is no truck access currently.	0.40	miles		
		177	7506402	Construct single phase tie 0.180 mile from Pole 41810934000160 to Pole 41810934000203. Remove 0.354 mile single phase line from Pole 41810934000103 to Pole 41810934000194, 2-4 AS built in 1948.	0.18	miles		
		188	7422402	Bridgeville / Norwich: Relocate line from Pole 40820593D30019 to Pole 40820593D30038	0.37	miles		
		192	7119705	Ivy Road rebuild 1 ph	1.30	miles		
		194	7430301	Rebuild/relocate 0.5 miles on circuit 7430301	0.50	miles		
		200	7407402	Village of Brinkhaven reconductor	0.30	miles		
		212	7121802	Royal Lane rebuild 1 ph	0.70	miles		
		233	7421602	Rebuild 0.17 miles on circuit 7421602	0.17	miles		
		241	7360201	Broom Road/ North: Relocate Line closer to the road, or on the other side of the road	0.42	miles		
		242	7506402	Construct single phase tie 0.319 mile from Pole 41810959000466 to Pole 41810959000563. Remove 0.355 mile single phase line from Pole 41810959000468 to Pole 41810959000222. Line built in 1948.	0.32	miles		
		244	7106001	Milarcik Rd relocate 1 ph	0.60	miles		
		250	7111201	Sinlge Phase Line Relocation to the east side of the road	0.25	miles		
		256	7360201	Broom Road/ North: Split Circuit	0.07	miles		
		311	7119802	Reconductor #4 copper to #2 AL along Christmas Run Blvd	0.25	miles		
		313	7512702	Rehab Area small wire. 4652' single-phase Add additional sectionalizing	0.88	miles		
		342	7514201	Rehab single phase line starting at Pole 40810140D40061 and ending at Pole 40810141B10014, including laterals. 3200'	0.61	miles		
		355	7407402	Dodd road reconductor	2.27	miles		
		371	7515002	Smyrna/ Freeport-Piedmont: Relocate Line	1.04	miles		
		372	7120302	Reconductor Small copper wire to #2AL along Ridge ave SE	2.00	miles		
		375	7337601	Relocate single phase line to Road. This can be broken down into 5 separate locations. Locations 1 and 2 are where most of the problems have occurred. 1. 259/148 to 259/258, 2000' 2. 283/154 to 283/159, 1400' 3. 283/32 to 283/171, 1200' 4. 283/233 to 283/36, 1000' 5. 283/122 to 284/503, 1600'	1.36	miles		
		379	7108502	Relocate singe phase line to Dublin Road	0.50	miles		
		381	7421502	East New Concord / College: Move line to other side of road	0.80	miles		
		383	7101905	Small wire replacement for most of the circuit single phase taps to #2AL	2.25	miles		
		384	7421502	East New Concord / College: Move line to other side of road	0.81	miles		
		402	7108904	Reconductor #6 copper to #2 AL on single phase taps	0.50	miles		
		416	7100701	Relocate single phase line along Chase Road	0.25	miles		
		473	0022802	Rule 11 - Union Ridge Rd Rebuild	3.24	miles		
							22.44	**$2,367,719**
3 Ph OH Line rebuild or relocate	Reliability "F	55	0006413	Upgrade 2/0 copper to 556 from pole 1872943717382 to pole 1870756717363 It ties to F-202	0.42	miles		
DROHREBA3		71	0005401	Upgrade 2/0 copper to 556 from pole 1847189721487 to pole 1847223722231. It ties to F5418	0.14	miles		
		79	7406502	Tie rebuild E. Lancaster/ East (7404202) to Rockbridge/sugar grove(7406502)	0.22	miles		
		98	7404202	Tie rebuild E. Lancaster/ East (7404202) to Rockbridge/sugar grove(7406502)	0.27	miles		
		106	0002604	Reconductor 3 spans 3-2 Cu with 3-556 Al week tie to F-2603 730ft	0.14	miles		
		116	7404502	Glassrock line extension	0.10	miles		
		119	7432901	East logan /Carborundum (7432901) to SE Logan/ Indust. (7424301)	0.50	miles		
		137	7108502	Relocating 3 phase conductor from Amsterdam Road to S Pearson ALY	0.50	miles		
		138	0003808	Upgrade Groves 3810 breaker zone 4/0 to 556 from pole 1888457705572 to pole 1884855705843 to eliminate circuit overload, allow for stronger circuit ties, and improve capacity for customer expansion; about 3600 feet	0.68	miles		
		156	7429403	Rebuild 0.21 miles on circuit 7429403	0.21	miles		
		165	7104003	State Route 39 rebuild 3 ph	1.20	miles		
		166	7401109	Mt Vernon Downtown tie	0.04	miles		
		169	7405105	N Newark East reconductoing	0.20	miles		
		170	0724301	East logan /Carborundum (7432901) to SE Logan/ Indust. (7424301)	0.83	miles		
		185	7504702	WR 74172361: This section of line is susceptible to trees out of ROW falling from the hillside above the line. Pole 40810237000054 to Pole 40810237000300: Relocate approximately 2000' of 3-phase line to the North side of SR 151. Use 4-1/0 AA for the new line. Any taps can be fused at 40T.	0.38	miles		
		186	7432902	Strengthen tie within East Logan/Rural (7432902)	0.40	miles		
		206	7424202	Strengthen tie between West Logan/ East(7424202) and Rockbridge/ Rockbridge(7406501)	0.72	miles		
		214	7400502	Rebuild 0.6 miles on circuit 7400502	0.60	miles		
		217	0006405	Upgrade 2/0 copper to 556 from pole 1866123727841 to pole 1869176727498 It ties to F-6408	0.58	miles		
		219	7401204	Rebuild 0.77 miles on circuit 7401204	0.77	miles		
		220	0006405	Upgrade 4/0 copper to 556 from pole 1866628729147 to pole 1864024729283 It ties to F-6412	0.50	miles		
		222	7127101	Reconductor #6 copper wire to #2 AL along along State Route 179.	0.25	miles		
		225	7212401	Rebuild/Reconductor 2/0 CU from 41840549A30370 to 41840525B40103 (include all the laterals which has 2/0 CU)	0.19	miles		
		226	7421602	Rebuild 0.27 miles on circuit 7421602	0.27	miles		
		227	0006404	Upgrade 4/0 and 2/0 copper to 556 from pole 1862746721883 to pole 1862797722574 It ties to F-6406	0.14	miles		
		230	0031071	Harmer Hill Belpre Section 1 of 6	0.50	miles		

Program	Category	Project Ranking	Station/Circuit	Description	Units	UOM	Program Total	Est Capital Cost
		235	7504702	WR 74172544: These improvements will allow the transfer of approximately 90 customers to a more reliable feed. •Pole 40810259000030 to Pole 40810259000149: Multiphase 3000' of line by adding additional phase. Reconductor existing line to make it 3-2AA. • Pole 40810259000149: Transfer customers to East towards Pole 40810259000146 to new phase. • Pole 40810259000032 to Pole 40810259000254: Construct 1100' single phase tie line using 2-2 AA.	0.78	miles		
		236	7406501	Strengthen tie between West Logan/ East(7424202) and Rockbridge/ Rockbridge(7406501)	1.12	miles		
		243	7408402	Rebuild 0.75 miles on circuit 7408402	0.75	miles		
		246	7426902	Martinsburg Martinsburg reconductor	0.16	miles		
		249	0003201	Upgrade 2/0 copper to 556 from pole 1841574725153 to pole 1842823725088. It ties to F-5407	0.24	miles		
		259	7420801	Acedemia East line relocate	0.36	miles		
		261	7420802	Academia West Sychar reconductor	0.46	miles		
		263	7101301	Multiphase OH Line Relocation between poles 41810916000003 and 41810915000364	0.25	miles		
		265	7416101	Rebuild 0.43 miles on circuit 7416101	0.43	miles		
		266	7400503	Rebuild 0.57 miles on circuit 7400503	0.57	miles		
		268	0031071	Harmer Hill Belpre Section 3 of 6	0.83	miles		
		271	0031071	Harmer Hill Belpre Section 4 of 6	0.86	miles		
		279	7506002	Rehab 1800' of 3-phase #6 Cu.	0.34	miles		
		282	7401401	Granville Granville reconductorsmall wire	1.00	miles		
		283	7401603	Newark East reconductor	0.93	miles		
		287	0006404	Upgrade #4 copper to #4 aluminum from pole 1862790722482 to pole 1861736722540	0.20	miles		
		297	7420802	Academia West Pleasant St reconductor	0.65	miles		
		303	7233402	Reconductor 1 CU from pole 41830881000026 to pole 41830905A40003 with 556 AL	0.78	miles		
		305	7102301	Small wire replacement on Shepler Church Ave SW to pole 41810842C40076 to #556 AL	1.50	miles		
		310	0031071	Harmer Hill Belpre Section 5 of 6	1.40	miles		
		316	0031071	Harmer Hill Belpre Section 2 of 6	1.50	miles		
		322	7206101	Reconductor 2 AS from 41840946000002 to 41840946A10014 with 4/0 AA	0.56	miles		
		328	7500901	Neffs / Key Ridge: Move Line closer to Road	0.13	miles		
		331	7106001	Newport BZ rebuild 3 ph	2.00	miles		
		344	0031071	Harmer Hill Belpre Section 6 of 6	2.21	miles		
		346	7423303	Sharon Valley Commercial reconductor main line to create tie	0.60	miles		
		351	7401102	Mt Vernon East load transfer	0.64	miles		
		356	7408003	Caldwell/East: Reconductor Rebuild	0.28	miles		
		359	0003805	Upgrade 2/0 conductor to 556 from pole 1888202702217 to 1886344702699 to 1886278701803 and 4/0 conductor from pole 1886278701803 to 1886231701105 to 1884953701207 to 1884774698616; about 3900 feet	0.75	miles		
		364	7100702	Relocatie 3 phase line along state route 9	0.25	miles		
		370	7106001	Newport Phase 3 rebuild 3 ph	2.70	miles		
		377	7110101	Reconductor #4 copper wire to #2 AL alonf N summit street. Possibly do the same for a couple spans before the recloser	0.50	miles		
		380	7101302	Small Wire Replacement from Sandyville road, Crossroads NE, and Ridge Rd NE from small copper to #2AL	1.50	miles		
		391	7120901	Reconductor #4 copper to #2 AL along Carson St	1.00	miles		
		403	7408001	Caldwell/ Cald.Glen: Reconductor Rebuild	0.68	miles		
		405	7100703	Reconductor #6 copper wire to #2 AL along 2nd st NE and taps	1.00	miles		
		478	0022803	Rule 11 - McArthur Reconductor	1.57	miles		
		479	7411202	Rule 11 - Beaver West Reconductor Main 3-Phase Line	5.05	miles		
		508	0017601	New Hopetown Station D-Line Relocates	4.50	miles		
		529	0017701	Seaman-Stuart Transco D-Line underbuild	1.06	miles		
		529	0018701	Transco-Vigo Mobile D-Line Work Locations	4	each		
		Line work by Ohio Distribution		TP2015055 ElLiot-Strouds Run - D-Line underbuild				
		Line work by Ohio Distribution		TP2018156 New Lex-Shawnee - D-Line underbuild				
							52.82	**$10,675,453**
1 Phase Overhead Line Ext	Reliability "F	20	7401606	Newark Stevens install neutral	0.06	miles		
DROHEXTA1		182	7423802	S Granville Rural line extention	0.07	miles		
							0.13	**$4,999**
3 Phase Overhead Line Ext	Reliability "F	369	7511102	Monroe Street / South: Relocate Line	0.75	miles		
DROHEXTA3								
							0.75	**$102,916**
3 Phase Underground Line Tie	Reliability "F	238	0003101	Install N.O. Tie SW	2.00	each		
DRUGTIEAT								
							2	**$70,677**
Circuit Tie	Reliability "F	9	0001003	F1003 - Reconductor 224 ft (.0424 miles) of 4/0 to 556AL - circuit tie to F-1002 (conductor on both side of switch between 1874319718284 and 1874096718280)	0.04	miles		
DROHTIEAT		16	0003002	F3002 - Reconductor 167 ft (.0316 miles) of 2/0CU to 556AL - circuit tie to F-3007 - SW#700	0.03	miles		
		19	0011804	Kimberly 04-05 Tie - Matheny Rd Rebuild/Reconductor Part 2-UG	0.00	miles		
		28	0011804	Kimberly 04-05 Tie - Connett Rd Rebuild Transmission Removal-Ten Spot Relocation 1B	0.01	miles		
		44	0002502	F2502 - Reconductor 909 ft (0.1721 miles) of 2/0 CU to 556AL - circuit tie to F-1007 - underbuilt on tpoles	0.17	miles		
		51	0003103	Install N.O. Tie SW	1	each		
		56	0003007	F3007 - Reconductor 597 ft (.1131 miles) of 1/0CU to 556AL - circuit tie to F-3002 - SW#700	0.11	miles		
		63	0011804	Kimberly 04-05 Tie - Connett Rd Rebuild Part 2 -UG	0.02	miles		
		70	0001204	Re-conductor 1 Kft with 3-556 AL & 1-4/0 AA from pole 1859566762765 to 1860576762743 on DIR WR 75588905. DIR work (WR 75588905) associtated with DACR	0.20	miles		
		81	0001209	Re-conductor 1.5 Kft with 3-556 AL & 1-4/0 AA from pole 1854609765225 to 1855269764936 on DIR WR 75814899. DIR work (WR 75814899) associtated with DACR	0.28	miles		
		91	0001209	Re-conductor 1.1 Kft with 3-556 AL & 1-4/0 AA from pole 1854319767422 to 1855426767345 on DIR WR 75816617. DIR work (WR 75816617) associtated with DACR	0.21	miles		
		111	0001004	F1004 - Reconductor 1062 ft (.2012 miles) of 2/0CU to 556AL - circuit tie to F-1001 - SW#1078 (1883078720609 to 1884133720529)	0.20	miles		
		116	7515002	Smyrna / Freeport: Reconductor to 556 to be able Tie Flushing Station	1.93	miles		
		142	0001204	Rebuild & re-conductor with 3-556 AL & 1-4/0 AA conductor to strengthen tie between F1212 & F1204.	0.33	miles		

Program	Category	Project Ranking	Station/Circuit	Description	Units	UOM	Program Total	Est Capital Cost
		145	0003102	Install N.O. Tie Sw	1.00	each		
		160	0002902	Rebuild and remove 3rd ciruit (F2904) from Weber Ave. to Clinton Station.	0.33	miles		
		162	0011804	Kimberly 04-05 Tie - Connett Rd Rebuild Part 1-UG	0.10	miles		
		203	0001004	F1004 - Reconductor 2892 ft (.5478 miles) of 4/0 to 556AL - circuit tie to F-1001 - SW#1966 (1882015718034 to 1883360719792)	0.55	miles		
		204	0024702	Waverly Bristol Village Tie 2 Rebuild to F-0024701	0.21	miles		
		223	7516802	Upgrade 3200' of 3-phase to improve circuit tie capabilities.	0.61	miles		
		229	0024702	Waverly Bristol Village Tie Line to F-24701	0.29	miles		
		255	0033474	Belpre Constitution Reconductor Section 2	0.47	miles		
		257	0027801	Treggo Rebuild Tie Line to F-22604	0.38	miles		
		270	0011102	Mulberry/E North St. Rebuild	0.71	miles		
		281	7506002	Rehab and upgrade 9600' of circuit to Provide circuit to circuit transfer capabilities	1.82	miles		
		284	0033474	Belpre Constitution Reconductor Section 7	0.61	miles		
		292	0011804	Kimberly 04-05 Tie - Connett Rd Rebuild Part 2 A	1.10	miles		
		293	0011804	Kimberly 04-05 Tie - Connett Rd Rebuild Transmission Removal-Ten Spot Relocation 1A	3.00	miles		
		295	0033474	Belpre Constitution Reconductor Section 4	0.69	miles		
		296	0011804	Kimberly 04-05 Tie - Connett Rd Rebuild Part 1 B	1.10	miles		
		298	0033474	Belpre Constitution Reconductor Section 3	0.73	miles		
		300	7740101	Rehab Circuit Tie between Georges Run Standard Slag and Tidd Brilliant.	1.98	miles		
		301	0033474	Belpre Constitution Reconductor Section 5	0.76	miles		
		302	0011001	Lee 01 - Elliott 03 Tie		miles		
		304	0033474	Belpre Constitution Reconductor Section 1	0.77	miles		
		306	0001315	Create circuit tie between F1315 and F1310	2.00	miles		
		314	0024703	Piketon Rebuild Tie Line to F-24802	0.73	miles		
		320	0011804	Kimberly 04-05 Tie - Kimberly Removal	0.82	miles		
		321	0011804	Kimberly 04-05 Tie - Connett Rd Rebuild Part 1 A	1.42	miles		
		323	0011804	Kimberly 04-05 Tie - Connett Rd Rebuild Part 2 B	1.40	miles		
		325	0011804	Kimberly 04-05 Tie - Matheny Rd Rebuild/Reconductor Part 1	1.40	miles		
		335	0033474	Belpre Constitution Reconductor Section 6	0.97	miles		
		336	0011804	Kimberly 04-05 Tie - Kimberly Rd Rebuild/Reconductor	1.00	miles		
		349	0011804	Kimberly 04-05 Tie - Matheny Rd Rebuild/Reconductor Part 2	1.71	miles		
		361	0011001	Lee 01-02 BZ Reconductor/Rebuild	2.84	miles		
		363	0017902	Londonderry Rebuild Tie Line to F-18701 Part 1	0.88	miles		
		417	0024802	Jasper Rebuild Tie Line to F-24703	2.47	miles		
							39.37	**$6,228,327**
Small Wire Repl Ovhd	Reliability "F	49	7213501	Reconductor 4 CU from pole 41840525C40012 to pole 41840525C40011 with 2 AA	0.07	miles		
EDN015040		60	7213501	Reconductor 4 CU from pole 41840525C10034 to pole 41840525C20184 with 2 AA	0.10	miles		
		144	7422704	Smallwire Rebuild	0.13	miles		
		149	0001003	F1003 - Reconductor 592 ft (0.1122 miles) of #4CU to 556AL (continuation of BZIP work) - Replace poles	0.11	miles		
		172	7213502	Reconductor 6 CU from pole 41840525C20061 to pole 41840525C20260 with 2 AA	0.11	miles		
		175	7429302	Smallwire Rebuild	0.81	miles		
		195	7216101	Reconductor 4 CU from 41840501B40153 to 41840525A30199 with 2 AA (include laterals with 4 and 6 CU)	0.60	miles		
		205	7422704	Smallwire Rebuild	0.32	miles		
		231	7202302	Rebuild/Reconductor 4 Cu from pole 41830764C10031 to 41830764A30019 with 1/0 AA	0.31	miles		
		237	7213501	Reconductor 6 CU from pole 41840525C20088 to pole 41840525C40082 with 2 AA	0.14	miles		
		248	7204301	Reconductor 4 CU and 6 CU from pole 41840904D40007 to 41840928C10031 with 1/0 AA and 2 AA (depending upon the load)	0.70	miles		
		269	7430301	Smallwire Rebuild	0.27	miles		
		274	7229604	Reconductor 4 CU and 2 AS from 41840877000170 to 41840901000073 with 1/0 AA	1.00	miles		
		312	7235001	Reconductor 4 CU from 41830649000019 to 41830649000070 with 1/0 AA	0.86	miles		
		319	7234102	Rebuild of #4 CU and #2 AS on Silver Spring South Circuit. This includes 0.855 miles of 3 phase line and 5 miles of single phase line	5.85	miles		
		329	7429305	Smallwire Rebuild	1.00	miles		
		337	7408401	Smallwire Rebuild	1.30	miles		
		343	7218403	Reconductor 4 CU and 2 AS from 41840637D30028 41840637D40014 with 2 AA (include laterals with 4 CU)	0.11	miles		
		354	7207101	Reconductor 4 CU from pole41840315000012 to 41840314000062 with 1/0 AA	0.98	miles		
		373	7211801	Reconductor 4 CU from pole 41840878000051 to 41840902000010 with 1/0 AA	0.95	miles		
		376	7408402	Smallwire Rebuild	0.38	miles		
		412	7206203	Reconductor 6 CU from pole 41840850D30008 to pole 41840850D30073 with 2 AA	0.14	miles		
							16.24	**$2,309,084**
Cutout Arrester Program	Reliability "F	146	7100403	Sharon Valley Commercial Cutout Program	3	each		
000016485		148	7401402	Sharon Valley Sharon Valley cutout replacement	20	each		
		339	7100804	Granville Main Cut out replacement	1	each		
							24	**$8,418**
Sectionalizing Program	Reliability "F	1	0001205	Sectionalizing - Reufuse / replace 3 cutout locations.	3	each		
000004647		2	7422402	Sectionalizing	1	each		
		6	0001209	Sectionalizing - Reufuse / replace cutout locations.	8	each		
		10	7201606	Additional sectionalizing	10	each		
		11	0001204	Sectionalizing - Reufuse / replace / remove 9 cutout locations.	9	each		
		15	7514201	Additional Sectionalizing	1	each		
		24	7218403	Additional Sectionalizing (install 3 single phase reclosers on or around pole 41840637D30050)	3	each		
		26	0001212	Sectionalizing - Reufuse / replace cutout locations.	8	each		
		26	0001213	Sectionalizing - Reufuse / replace cutout locations.	8	each		
		29	7400801	Thornville Thornville install Viper	1	each		
		34	7509403	Additional Sectionalizing: Replace solid blades with fuses and fuse unfused taps.	3	each		
		37	7235802	Additional Sectionalizing (fused cutouts)	8	each		
		38	7237001	This is a place holder for 2021 BZIP program. Detailed engineering study needs to be done before issuing any recommendations	10	each		
		50	7405901	Waterstreet/ East: Add Fuses to circuit	3	each		

Program	Category	Project Ranking	Station/Circuit	Description	Units	UOM	Program Total	Est Capital Cost
		52	0001208	Sectionalizing - Reufuse / replace / relocate 8 cutout locations.	8	each		
		53	7413802	Etna Wagram Sectionalizing	1	each		
		57	7501901	Powhatan / Powhatan: Refuse on Line Section	6	each		
		58	0001213	Sectionalizing - Reufuse / replace cutout locations.	8	each		
		66	7506001	Additional Sectionalizing: Add fuses to tap lines.	10	each		
		72	7413801	Etna 12 sectionalizing	1	each		
		73	7408001	Caldwell/ Cald.Glen: Add Fuses to circuit	3	each		
		75	7218403	Additional sectionaliaing (fused cutouts)	12	each		
		77	0004602	Astor 4602 BZIP & Sentient Fault Indicators	30	each		
		78	0006702	2021 BZIP - Refuse / replace 25 cutout locations.	25	each		
		80	0005702	Parsons 5702 BZIP & Sentient Fault Indicators	30	each		
		82	7204302	This is place holder for BZIP 2021. Detailed engineering is required before issuing any recommendations	10	each		
		83	7504402	Install Viper Recloser on Pole 40810038C30034 to reduce size of breaker zone by 3000'.	1	each		
		85	0001934	BZIP & SENSORS HYATT F-1934	30	each		
		86	7504104	Additional Sectionalizing: Add fuses to taps.	6	each		
		87	0008902	Shannon 8902 BZIP & Sentient Fault Indicators	30	each		
		88	0004608	Astor 4608 BZIP & Sentient Fault Indicators	30	each		
		89	7423602	West Hebron Etna install Viper	1	each		
		90	0003132	B-ZIP & Sentient Fault Indicators	20	each		
		93	7404404	East Newark Industrial sectionalizing	30	each		
		95	0007005	Etna 7005 Sectionalizing. Add recloser. Add switch. Refuse.	20	each		
		97	7430301	Sectionalizing	6	each		
		100	0009232	BZIP, MALISZEWSKI CKT. F-9232	30	each		
		102	0007104	Bixby 7104 BZIP & Sentient Fault Indicators	30	each		
		103	0003813	Groves 3813 BZIP & Sentient Fault Indicators	30	each		
		104	7405902	Waterstreet/Westside: Add Fuses to circuit	2	each		
		109	0003806	Groves 3806 BZIP & Sentient Fault Indicators	30	each		
		110	7513401	Additional Sectionalizing Pole 40810090A40026-Install Recloser Pole 40810090000107-Install Cutout	4	each		
		120	0001201	Sectionalizing - Reufuse / replace 10 cutout locations.	10	each		
		121	7506002	Additional Sectionalizing: Replace fuse with recloser, add additional fusing.	7	each		
		122	0002909	2021 BZIP - Refuse / replace 13 cutout locations	13	each		
		124	0005401	BZIP & Sentient Fault Indicators - Hess F-5401	30	each		
		129	0000702	high level install 1 recloser, 3-3phase sentient installations, 6 cutout locations	10	each		
		140	0007703	BZIP & Sentient Fault Indicators- Ohio Stat 7703	30	each		
		147	7423802	S Granville Commercial sectionalizing	4	each		
		150	7506402	Relocate Recloser from Pole 41810959A30001 to Pole 41810959A30047.	1	each		
		151	0005407	BZIP & Sentient Fault Indicators - Hess F-5407	30	each		
		152	0021802	BZIP, LINCOLN CKT. F-21802, YR. 2021	30	each		
		154	7405105	N Newark Sectionalizing	1	each		
		159	7504402	Additional Sectionalizing 6 cutouts	6	each		
		166	0368732	Mink South Sectionalizing	1	each		
		173	7513402	This addresses 2 zones, Breaker and recloser 40810163A40069. Additional Sectionalizing. Add Viper near State Highway Patrol to reduce breaker zone. Add fuses to unfused taps in Breaker Zone. Look at recloser 163A4/69 to see what can be done so single phase tap on Ward drive has protection so not to take out this recloser.	12	each		
		178	0022904	Clark 04 - BZIP		each		
		184	0003002	F3002 - Install recloser (possible BZIP action) - PLACEHOLDER	3	each		
		188	7401606	Newark Stevens Sectionalizing	6	each		
		193	0027801	Mount Tabor Road Sectionalizing	5	each		
		196	0000713	high level install 1 recloser, 3-3phase sentient installations	4	each		
		199	0004601	Astor 4601 Sectionalizing. Add Recloser. Refuse/Fuse various locations. Add Sentient Fault indicators.	30	each		
		215	7403203	Heath Industrial sectionalize	1	each		
		215	7430102	North Hebron Industrial Park Sectionalizing	1	each		
		218	7405104	N. Newark West sectionalizing	3	each		
		224	7423303	Sharon Valley Commercial relocate recloser replace with Viper	2	each		
		232	0024702	Wilson Run Rd Sectionalizing	10	each		
		252	0024705	Schuster Rd Sectionalizing	8	each		
		253	7408003	Caldwell/East: Add Switch	2	each		
		254	0015402	BZIP PROGRAM	6	miles		
		262	7507201	Additional Sectionalizing 6 reclosers 20 cutouts	26	each		
		272	7105602	Newcomerstown / Business: Add Viper on Pole 40820286A30002	1	each		
		278	7514202	Additional Sectionalizing: Pole 40810164D40121 install Viper	1	each		
		286	0011102	BZIP PROGRAM	2	miles		
		290	7422401	Bridgeville / Norwic: Install Recloser Near Pole 40820593D20005	14	each		
		299	7509403	Sectionalizing Improvement: Replace reclosers with DA Viper. Install Viper Near 40810165D30148. Install additional fusing as needed.	10	each		
		352	7513902	Bannock Road / South: Refuse	12	each		
		385	7105604	Newcomerstown / Simonds: Add Viper on Pole 40820286D10038	1	each		
		3	7109801	Fused Cut Out Install on pole 41820782D10135	1	each		
		4	7209502	Additional Sectionalizing (Recloser)	1	each		
		5	7225204	Additional Sectionalizing (fused cutouts)	7	each		
		7	7229604	Additional Sectionalizing (fused cutouts)	5	each		
		8	7101301	Fused Cut Out Install on pole 41810915000344 for taps running north and south	2	each		
		12	7216101	Additional Sectionalizing (fused cutouts)	8	each		
		13	7237004	Additional Sectionalizing (fused cutouts)	10	each		
		14	7211801	Additional Sectionalizing (fused cutouts)	10	each		
		17	7423303	Additional Sectionalizing (fused cutouts)	3	each		
		18	7225202	38th & Cathy Dr. Canton fuses	10	each		
		21	7113604	Additional Sectionalizing (fused cutouts)	5	each		
		22	7201702	Additional Sectionalizing (fused cutouts)	10	each		
		23	7234901	Additional Sectionalizing (fused cutouts)	8	each		
		31	7227502	Additional Sectionalizing (fused cutouts)	7	each		
		32	7233402	Fused Cut Out Install on following poles: 41820853000431, 41820853000167, 41820853000166, 41820853A40002, 41820853C10039, and 41820853C10059	12	each		
		33	7108002	38th St. 5 fuses	6	each		
		35	7108703	Additional Sectionalizing (fused cutouts)	5	each		
		39	7423301	Additional Sectionalizing (fused cutouts)	40	each		

Program	Category	Project Ranking	Station/Circuit	Description	Units	UOM	Program Total	Est Capital Cost
		40	7238402	Additional Sectionalizing (fused cutouts)	10	each		
		41	7235001	Additional Sectionalizing (fused cutouts)	15	each		
		43	7207101	Larson Rd 5 fuses	10	each		
		46	7212401	Additional Sectionalizing (fused cutouts)	15	each		
		48	7105902	Additional Sectionalizing (fused cutouts)	5	each		
		61	7202302	Additional Sectionalizing (fused cutouts)	25	each		
		67	7207301	Fused Cut Out Install on poles 41810819C30245 and 41810819C40346	10	each		
		74	7231401	Additional Sectionalizing (fused cutouts)	12	each		
		84	7102302	Additional Sectionalizing (fused cutouts)	2	each		
		99	7233002	Fused Cut Out Install on the following taps: 41810820A20097, 41810820A20013, 41810820A20382	15	each		
		115	7234101	25th & Harvard Sts recloser	20	each		
								$2,486,069
Pole Replace not Cycle Inspection	Reliability "F	45	7202302	This is a place holder for BZIP 2021. Detailed engineering study is needed before issuing any recommendations	10	each		
DROHPOLAP		53	7414001	BZIP	10	each		
		92	7429302	Bzip	10	each		
		96	7216101	This is a place holder for BZIP 2021. Detailed engineering study is required before issuing any recommendations	10	each		
		101	7225204	This is a place holder for BZIP 2021. Detailed engineering study is required before issuing any recommendations	10	each		
		107	7206104	This is place holder for BZIP 2021. Detailed engineering study is required before issuing any recommendations	10	each		
		113	7201902	This is a place holder for BZIP 2021. Detailed engineering study is required before issuing any engineering recommendation	10	each		
		128	7237003	This is a place holder for BZIP 2022. Detailed engineering study is required before issuing any recommendation	10	each		
		221	7439002	Replace poles	6	each		
		529	7422703	Tower Replacement	2	each		
							88	**$402,560**
Convert OH to UG	Reliability "F	258	7407403	Millwood Apple Valley convert overhead to underground	1.2	miles		
'DRUGREBA3								
							1.20	**$507,790**
URD Cable Rehab Replacement	Reliability "F	251	0027302	Break up large underground subdivision and redistribute customers between isolation devices, add GOAB for UG Risers	0.50	miles		
DROHREPEE			Columbus Various	Replace failed, end of life undergroud cables	94.70	miles		
							95.2	**$16,468,200**
URD Cable Rehab Injection	Reliability "F		Columbus Various	Cable Injection Rejuvination	24.05	miles		
DROHINJEE								
							24.05	**$1,778,000**
UG Line Extension	Reliability "F	288	7414001	West Granville Pioneer Rural install new underground primary	0.20	miles		
DRUGEXTA3								
							0.20	**$78,798**
Hendrix Spacer Cable	Reliability "F	464.1	0030471/0013102	Corner Coolville - Hendrix	8.83	miles		
		464.1	0033474	Veto Rd - Hendrix	1.45	miles		
		464.1	0011201	Burr Oak - Hendrix	3.48	miles		
							13.76	**$7,970,199**
Planning Distribution, Station & Transmission	Project "C"		Hayden Station	Install 1-50 MVA transformer & 3-13 kV circuits				
	Project "C"		Vassell Station	Install 1-50 MVA transformer & 3-13 kV circuits				
	Project "C"		Ridgely Station	Install 1-50 MVA transformer & 3-34.5 kV circuits				
	Project "C"		Morse Rd Station	Install 1-13 kV circuit (F-5818)				
	Project "C"		Fifth Ave Station	Upgrade T1 with 1-50 MVA transformer & 4-13 kV circuits				
	Project "C"		Stetson Run Station	Purchase property for future station				
	Project "C"		Ada Station	Add metering for Wind & Solar DER				
	Project "C"		Batesville Station	Purchase additional property for future station expansion				
	Project "C"		Brice Station	Install 1-13 kV circuit				
	Project "C"		Parsons Station	Install 1-13 kV circuit				
	Project "C"		Salerno Station	Install 1-30 MVA transformer & 2-12 kV circuits				
	Project "C"		North Middlepoint Station	Upgrade with 1-20 MVA transformer				
	Project "C"		Gahanna Station	Upgrade with 2-50 MVA transformers				
	Project "C"		Fifth Ave Station	Install 1-50 MVA (T2) & 2-13 kV circuits				
	Project "C"		Neffs Station	Upgrade with 12 MVA transformer and 2-12 kV circuits				
	Project "C"		Stetson Run Station	Install 1-20 MVA transformer & 2-12 kV circuits				
	Project "C"		Barnesville Station	Install 2-20 MVA transformers & 4-12 kV circuits				
	Project "C"		Van Wert-East Circuit	Reconductor 3.3 kft of line				
	Project "C"		Poth Station	Install 2-50 MVA transformers & 8-13 kV circuits				
	Project "C"		Auglaize-Stone Circuit	Reconductor & multiphase 4.56 miles of line				
	Project "C"		White Rd Station	Install 1-50 MVA & 2-13 kV circuits				
	Project "C"		S. Fultonham	Retire station and line				
	Project "C"		Shannon Station	Install 1-13 kV circuit				
	Project "C"		Babbitt Station	Install 1-50 MVA & 2-34.5 kV circuits				
	Project "C"		OSU Station	Install 1-13 kV circuit				
	Project "C"		Corridor Station	Install 1-34.5 kV circuit				
	Project "C"		Saint Clair Ave Station	Reconductor UG cable				
	Project "C"		Morse Rd Station	Install 1-13 kV circuit (F-5819)				
	Project "C"		Elliot Station	Install 1-12 kV circuit				
	Project "C"		West Malta Station	Rebuild 12 kV bus, install 3rd 12 kV circuit & SCADA				
	Project "C"		Roseville Station	Upgrade with 9.375 MVA transformer, 2-12 kV circuits & 4 kV converson				
	Project "C"		Slate Mills Station	Rebuild with 1-20 MVA & 2-12 kV circuits				
	Project "C"		Astor Station	Replace xfmr cables, ckt cables, 7-regulators & 2-breakers				
	Project "C"		Gomer Station	Install 1-10 MVA transformer & 2-12 kV breakers				
	Project "C"		Luray Drive Station	Purchase property for future station				
	Project "C"		Pleasant Street Station	Install 1-12 kv circuit				

Program	Category	Project Ranking	Station/Circuit	Description	Units	UOM	Program Total	Est Capital Cost
	Project "C"		Central Avenue Station	Replace 1-9.375 MVA transformer and fence				
	Project "C"		Seel Station	Install 2-20 MVA transformers & 4-12 kV circuits				
	Project "C"		Crooksville/Isabella Stations	Construct 4.5 mile tie line				
	Project "C"		Shawnee Station	Install SCADA, circuit switcher, replace 2 breakers and relaying				
	Project "C"		Marion Rd. Station	Replace transformer cables & 14-three phase regulators				
	Project "C"		Meigs Station	Upgrade with 20 MVA transformer & add 1-12 kV circuit				
	Project "C"		Antwerp 4kV Circuit	4 to 12 kV Voltage Conversion				
	Project "C"		Highland Terrace Station	Rebuild with 1-20 MVA & 2-12 kV circuits				
	Project "C"		Ruby Station	Install 1-12 MVA transformer and 3-12 kV circuits (replacing Robyville Station)				
	Project "C"		Wilson & McComb Stations	Equipment rehabilitation				
	Project "C"		Guysville Station	Install 1-20 MVA transformer & 4-12 kV circuits				
	Project "C"		Rarden, Otway & Mcdermott Stations	Purchase 2-station sites, install 1-25 MVA & 2-34.5 kV circuits, 2-9.375 MVA transformers and 4-circuits, remove three deteriorated stations.				
	Project "C"		West Gallion	Replace 2 breakers, asociated switches & add circuit switcher.				
	Project "C"		Lick Station	Install (2) Rural Bays, (2) 2000kVA 12kV 3-Single Phase Bus Regulators, (7) 12kV CBs, and animal guard fence/ D-line guards				
								$65,000,980
Risk Mitigation	Risk & Asset "D"		Pole Inspection	Pole Replacement	9,238	each		**$18,480,176**
			Underground Distribution Inspection	Inspect URD Above ground structures	43865	each		
				URD Inspection Repair ~ Inspect above ground structures (padmounts, enclosures, pedestals, etc.)	4656	each		**$474,873**
			Overhead Line Inspection	Inspect overhead distribution lines	7,801	Dist (mi)		
				OH Circuit Inspection Repairs	24,967	JSH		**$2,543,618**
			Recloser Replacement	Overhead recloser replacement	634	each		**$3,830,286**
								$25,328,953

Program	Category		Sub-Program	Description	each	UOM		
Network Rehab	Reliability "F"		Arc Flash Mitigation	Replace 480V network protectors with each that	18	each		
			PILC/Primary Mitigation	Replace underground conductor identified through program criteria.	2.64	miles		
			Transformer/Protector Replacement	Replace network transformer and protector assets identified as reaching the end of their engineered life based upon inspection results from	15	each		
			Banded Cable Replacement	Replace underground conductor idenfied with deteriorated neutral to improve reliabilitiy	1.22	miles		
			Manhole/Vault Civil Rehabilitation	Replace deteriorated underground network civil structures that are identified based on results of the network asset inspection program.	12	each		
			MVI/Tru-Break Installations	Install primary load break vacuum switches and visible open at 480V locations for arc flash policy and improved reliability.	20	each		
			High Thermal Event System Installations	Install systems in 480V network vaults which will provide critical safety protection for AEP personnel and the public.	7	each		
			Other Network Reliability	Conversation of south network 480v mini-grid	4	each		
			Other Network Reliability	Online DGA Transformer Monitoring Installations	12	each		
			Other Network Reliability	Installation of DTS and DAS systems at Vine Station	1	each		**$10,000,000**

Program	Category		Sub-Program	Description	each	UOM	UOM	
Non-Network Rehab	Reliability "F"		Non-Network Electrical Renewal	Re-conductor identified underground station exit power cable	8.00	miles		
			Non-Network Civil Duct/MH Rehab	Replace distribution underground duct and manhole systems	8.00	miles		
			Other Non-Network Reliability	Arena district capacity improvements	0.90	miles		
			Other Non-Network Reliability	Arena district switchgear replacements and modernization	6.0	each		**$15,840,000**

AEP Ohio 2022 Distribution Work Plan Project Detail

Program	Category	Project Ranking	Station/Circuit	Description	Units	UOM	Program Total	Est Capital Cost
1 Ph OH Line rebuild or relocate	Reliability "F"	280	7202302	Reconductor 4 AS from pole 41830789000066 to 41830789000190 with 2 AA	0.05	miles		
DROHREBA1		307	7405104	N.Newark reconductor	0.69	miles		
		309	7407401	Millwood Millwood reroute primary out of woods	0.56	miles		
		326	7506402	Construct single phase tie 0.506 mile from Pole 41810958C40029 to Pole 41810958C40029. Remove 0.247 mile single phase line from Pole 41810958000241 to Pole 41810958000241. Line built in 1946.	0.51	miles		
		347	7518101	Rebuild/Relocate to Road 0.771 mile from Pole 40810130000269 to Pole 40810130000111. Existing wire is #4 and #2 AS	0.77	miles		
		353	7501702	Relocate single phase line to Road. Construct 2300' single phase line from Pole 40810353000019 to Pole 40810353000061. Remove 1300' single phase line from Pole 40810353000012 to Pole 40810353000006. Line built 1939.	0.44	miles		
		389	7404501	Glassrock Rural line relocation	1.62	miles		
		428	7101301	Reconductor #4 copper to #2 AL along Westbrook St SE	0.50	miles		
		429	7412301	Rebuild 0.85 miles on circuit 7412301	0.85	miles		
		444	7101301	Reconductor #4 copper to #2 AL along Howenstine Dr SE	0.50	miles		
		447	7406602	Glenwood / Derwent: Move line Alongside Zep Road	0.67	miles		
		451	7104802	West Lafayette/ School: Reconductor line and split West Lafayette CKT from East Main and County Road 151 because line is now underbuilt	2.25	miles		

Program	Category	Project Ranking	Station/Circuit	Description	Units	UOM	Program Total	Est Capital Cost
		452	7120302	Reconductor Small copper wire to #2AL along Breezehill Road SW	1.00	miles		
		471	7421701	Rebuild 0.7 miles on circuit 7421701	0.70	miles		
		483	7501001	Lansing / Bridgeport : Move line closer to road / Refuse Line section	0.25	miles		
		490	7100401	Reconductor #4 copper ot #2 AL along Allenford Dr SE	1.00	miles		
		502	7131604	Reconductor #4 copper wire to #2 AL along N Geyers Chapel Rd.	1.00	miles		
		505	7102103	Small wire replacement on Orchardview DR SE to #2AL	1.50	miles		
		517	7105503	Coshocton/Fairgrounds: Rebuild line For transferring opportunities	0.69	miles		
		518	7109001	North Coshocton/Roscoe: Rebuild line For transferring opportunities	0.75	miles		
		522	7421602	Rebuild 0.23 miles on circuit 7421602	0.23	miles		
		523	7421802	Rebuild 0.4 miles on circuit 7421802	0.40	miles		
		524	7421602	Rebuild 0.47 miles on circuit 7421602	0.47	miles		
		529	7050002	Relocate single phase line along Laramie Rd NW. New line will be on Carrollton North	0.50	miles		
		529	7109402	Relocate line to Colwood St.	1.00	miles		
		529	7108501	Single phase line relocation. Eliminate between poles 57-34 and 57-59	0.50	miles		
			Various	Preliminary Scoped				
							19.39	**5,720,848.00**
3 Ph OH Line rebuild or relocate	Reliability "F	30	0007702	Upgrade #2 copper to 556 from pole 1857204723973 to pole 1857169723310 It ties to OSU F-7703	0.13	miles		
DROHREBA3		54	0002003	Upgrade #4 copper to 556 from pole 1834127712401 to pole 1833789712328	0.13	miles		
		77	0007702	Upgrade #2 copper to 556 from pole 1860418730009 to pole 1859724728270. It ties to F-2910	0.50	miles		
		126	7430301	Rebuild 0.47 miles on circuit 7430301	0.47	miles		
		133	7429302	Rebuild 0.26 miles on circuit 7429302	0.26	miles		
		155	0003806	Groves 3806 Upgrade #2 copper to aluminum from 1884126697756 to 1885022696601; about 1800 feet	0.34	miles		
		179	0002003	Upgrade 4/0 copper to 556 from pole 1833566713750 to pole 1834133712300 It ties to F-2002	0.60	miles		
		187	7421404	Rebuild 0.34 miles on circuit 7421404	0.34	miles		
		190	7400501	Rebuild 0.66 miles on circuit 7400501	0.66	miles		
		208	7504702	BZIP 2022 Infrared inspection Additional Sectionalizing Replace Porcelain cutouts	1.16	miles		
		209	7420802	Academia West reconductor	0.20	miles		
		210	7509201	BZIP 2022 Infrared inspection Additional Sectionalizing Replace Porcelain cutouts	3.10	miles		
		213	7405105	N Newark East reconductoing	0.29	miles		
		228	7404402	East Newark Cedar reconductor	0.44	miles		
		245	7409101	Rebuild 0.8 miles on circuit 7409101	0.80	miles		
		260	7401606	Newark Stevens reconductor	0.26	miles		
		273	7401204	Relocate	1.55	miles		
		275	7237001	Reconductor 6 CU from pole 41840874A20372 to 41840874A10112 with 556 AL	0.19	miles		
		277	0007005	Upgrade Etna 7005 #2 from 1895969711002 to 1898921709506 and from 1895941712011 to 1899088711941 to 1898921709506, needs done for sectionalizing job; about 9900 feet	1.88	miles		
		285	7402103	Fredricktown Waterford reconductor	0.22	miles		
		308	7407402	Millwood Danville relocation	0.17	miles		
		315	7400802	Thornville Mt Perry Reroute	1.13	miles		
		317	7201702	Rebuild/Reconductor 2-AS from pole 41830750D30001 to pole 41830750000047 with 4/0 AA	0.26	miles		
		318	7420802	Academia West reconductor	0.80	miles		
		324	7422701	Rebuild 0.59 miles on circuit 7422701	0.59	miles		
		334	7211601	Rebuild/Reconductor 2 AS from pole 41830440D30043 to pole 41830440D40250 with 1/0 AA	0.34	miles		
		340	0027302	White Rd 27302 Upgrade 4/0 copper to 556 from 1851914680804 to 1850506666182; about 15000 feet	2.80	miles		
		357	7104103	East Ave. 3 ph & Buckeye Hollow 1 ph	2.80	miles		
		358	0002902	Rebuild & re-conductor express circuit (top) from 4/0 CU to 556 AL.	1.59	miles		
		362	7512702	Rehab 5715' of 3-phase #6 Cu.	1.08	miles		
		366	7118402	Warsaw/ Nellie: Relocate Line	1.15	miles		
		382	7208902	Rebuild/Reconductor 2/0 CU with 556 AL from Sub-station to pole 41850766C30004	0.51	miles		
		386	7503503	Rehab/relocate line where possible. From isolating Pole 40810190A10002 to the end of the line. 5000' of three-phase and 3000' of single-phase. Lincoln Heights	1.52	miles		
		393	7205302	Reconductor 2 AS from 41830548D20007 to 41830572000251 with 1/0 AA	0.36	miles		
		394	7129502	44th St Canton 3ph	0.50	miles		
		396	7237001	Reconductor 6 CU from pole 41840874A10112 to 41840874A10039 with 556 AL	0.11	miles		
		397	7518102	Rebuild/Relocate to Road 3.049 miles of 3 phase #2 AA. From Pole 40810107B20016 to Pole 40810108B10009.	3.05	miles		
		420	7427102	Rule 11 - Minford Stockdale Reconductor Main 3-Phase Line	0.31	miles		
		423	7109401	Reconductor #4 copper to #2 AL alond Kidron Rd	1.00	miles		
		434	7400904	Rebuild 0.73 miles on circuit 7400904	0.73	miles		
		438	7420401	Pittsburg Columbus reconductor	0.24	miles		
		440	7100403	Reconductor #4 copper ot #2 AL along Allen Ave SE	1.00	miles		
		458	0015803	Seaman North Rebuild	0.37	miles		
		459	7122401	Blacksnake Hill Rd. rebuild 3 ph	3.20	miles		
		469	7120302	Reconductor Small copper wire to #2AL along 53St SE	1.00	miles		
		474	7109402	Small wire replacement along sandusky Dr	2.00	miles		
		475	0015402	Hillsboro Old T-Line Rebuild	3.00	miles		
		477	0010901	US Highay 50 West Rebuild	1.32	miles		
		492	0014905	Logan Street Rebuild	0.41	miles		
		495	7119902	Small wire replacement starting at pole 41820981d30021	0.50	miles		
		499	0015801	Seaman Winchester Rebuild	0.44	miles		
		529	7111906	Small wire replacement at N Bever St at pole 41820806A30010	0.50	miles		
		529	7114502	Small wire replacement along Sylvan road at pole 41820831000566	0.75	miles		
		529	0027031	MULIT-PHASE OH REBUILD/RELOCATION	1.50	miles		
		529	7105503	Coshocton / Fairgrounds: Rebuild line and move Recloser	0.49	miles		

Program	Category	Project Ranking	Station/Circuit	Description	Units	UOM	Program Total	Est Capital Cost
		452.1	0016601	Superior-Center St-Coal Grove Tie Line & BZIP - 2020 through 2022 project	6.54	Miles		
			Various	Preliminary Scoped				
							57.57	**$22,779,202**
1 Phase Overhead Line Ext	Reliability "F	327	0030472	Corner Veto Moody Ridge	0.39	miles		
DROHEXTA1								
							0.39	**$15,109**
3 Phase Overhead Line Ext	Reliability "F	290	7401606	Newark Stevens reconductor	0.15	miles		
DROHEXTA3		333	7106903	South Coshocton / Water Tower: Move Line alongside Road	0.64	miles		
		351	7511001	Bellaire / Hospital: Backup feed for County Water Plant from Bellaire / 214	1.07	miles		
		470	7409702	Rutland 02 Small Wire	15.05	miles		
		527	0017001	Meigs New Feed	0.80	miles		
		529	0004603	Astor 4603 Add two phases from pole 1908201704796 to 1909750704685 in order to balance circuit; about 1500 feet. Circuit is very unbalanced: PH A 183 Amps, PH B 92 Amps, PH C 88 Amps	0.28	miles		
			Various	Preliminary Scoped				
							17.99	**$3,301,992**
3 Phase Underground Line Tie	Reliability "F	330	0036531	Create UG tie to create radial loop.	0.25	miles		
DRUGTIEAT		529	0021804	UNDERGROUND CIRCUIT TIE	0.60	miles		
			Various	Preliminary Scoped				
							0.85	**$413,656**
Overhead Circuit Tie	Reliability "F	25	0000908	Rebuild & re-conductor with 3-556 AL & 1-4/0 AA conductor to strengthen tie between F0908 & F1204.	0.10	miles		
DROHTIEAT		47	0001003	F1003 - Reconductor 1698 ft (.3216 miles) of small wire to 556AL - circuit tie to F-6413	0.32	miles		
		62	0003004	F3004 - Reconductor 1130 ft (.2141 miles) of 2/0 & 4/0AS to 556AL - circuit tie to F-3002 - SW#1785	0.21	miles		
		117	0003812	Groves 3812 Create Strong Circuit Tie with 3809 and 3813; about 750 Feet of OH line build/rebuild and 2 GOAB	0.14	miles		
		123	0002916	Rebuild & re-conductor with 3-556 AL & 1-4/0 AA conductor to strengthen tie between F2916 & F2909.	0.36	miles		
		139	0003802	Groves T-Line takeover; inherit t-poles with no distribution currently underbuilt and build 3-phase lines to create strong circuit tie with Astor 4608, Refugee Rd; about 3400 feet	0.64	miles		
		143	0007103	Bixby 7103 and Marion 0718: 3PH Triple Circuit OH Line Rebuild, remove bottom circuit and change taps in order to construct to standard double circuit configuration. Rebuild from pole 1871849694054 to pole 1875962693769, about 4200 feet. Remove/add GOAB HS for tie points.	0.80	miles		
		163	0002501	F2501 - Reconductor 4290 feet (.8125 miles) of 4/0 to 556AL - circuit tie to F-1007	0.81	miles		
		167	0002915	Rebuild & re-conductor with 3-556 AL & 1-4/0 AA conductor to strengthen tie between F2915 & F2909.	0.45	miles		
		176	0005601	Rebuild & re-conductor with 3-556 AL & 1-4/0 AA conductor to strengthen tie between F5601 & F5602.	0.45	miles		
		198	0005702	Parsons 5702 Create Strong Circuit Tie with 5703. Reconductor 5300 feet of #2AL and #4CU to 556 to strengthen circuit tie.	1.00	miles		
		239	0003813	Groves T-Line takeover; inherit t-poles with no distribution currently underbuilt and build 3-phase lines to create strong circuit tie with Shannon 8905, Chatterton Rd; about 3500 feet	0.66	miles		
		240	0007103	Bixby 7103 and Marion 0702: 3PH Triple Circuit OH Line Rebuild, remove bottom circuit and change taps in order to construct to standard double circuit configuration. Rebuild from pole 1879683693660 to pole 1875962693769, about 3800 feet. Remove/add GOAB HS for tie points. Remove dead conductor.	0.72	miles		
		289	0001212	Re-conductor 3.8 Kft with 3-556 AL & 1-4/0 AA from pole 1859282768619 to 1855735768827. DIR work (WR TBD) associtated with DACR	0.72	miles		
		291	0026002	F26002 - Reconductor 12685 ft (2.4025 miles) of 1/0 & 4/0CU to 556AL (double circuited w/ F-4532) - circuit tie to F-4505	2.40	miles		
		338	7423301	Sharon Valley Sharron Valley Reconductor	0.47	miles		
		345	0017902	Londonderry Rebuild Tie Line to F-18701 Part 2	1.21	miles		
		395	0030472	Corner Veto-Layman Barlow Tie Part 1	1.79	miles		
		418	0024701	Waverly Industrial Tie 2 Rebuild to F-0024702	0.46	miles		
		430	0024701	Waverly Industrial Tie Line to F-24702	0.64	miles		
		449	7730001	Bashan Racine Tie	13.60	miles		
		467	0023003	Strouds 03-04 BZ Reconductor/Rebuild	1.07	miles		
		507	7426102	Delta Conversion - Section 3 Tie to Sugar Hill	1.78	miles		
		529	0005408	Create circuit tie between F0212 and F5408	2.00	miles		
		529	0021702	OVERHEAD CIRCUIT TIES	0.50	miles		
		529	0024005	OVERHEAD CIRCUIT TIES	0.16	miles		
		529	0024007	OVERHEAD CIRCUIT TIES	0.08	miles		
			Various	Preliminary Scoped				
							33.55	**$10,800,727**
Small Wire Repl Ovhd	Reliability "F	158	7429303	Smallwire Rebuild	0.38	miles		
EDN015040		197	7429302	Smallwire Rebuild	0.48	miles		
		234	7204301	Reconductor 6 CU from pole 41840857A30022 to pole 41840857A30064 with 2 AA	0.14	miles		
		264	7408401	Smallwire Rebuild	0.56	miles		
		276	7426702	Small wire rebuild.	0.61	miles		
		294	7201901	Reconductor 4 CU from pole 41840836B30006 to pole 41840836B30022 with 1/0 AA	0.12	miles		
		348	7409101	Small wire rebuild.	0.30	miles		
		350	7200502	Reconductor 4 CU from pole 41830440D10094 to pole 41830440C20392 (include laterals with 4 CU and 6 CU) with 2 AA	0.44	miles		
		360	7231503	Reconductor 4 CU from pole 41830701000055 to pole 41830701000238 with 1/0 AA (Exclude UG)	0.93	miles		
		365	7234901	Reconductor 2 AS, 4 CU and 6 CU from pole location 41840459D30071A to 41840460B10015 with 1/0 AA and 2 AA	0.59	miles		
		387	7426702	Small wire rebuild.	0.72	miles		
		390	7216103	Reconductor 4 CU and 6 CU from pole 41840525A10057 to pole 41840525A20122 with 2 AA (including laterals with 4 CU and 6 CU)	0.51	miles		
		487	7408402	Smallwire Rebuild	1.02	miles		
		520	7400501	Smallwire Rebuild	0.19	miles		

Program	Category	Project Ranking	Station/Circuit	Description	Units	UOM	Program Total	Est Capital Cost
		521	7400501	Smallwire Rebuild	0.20	miles		
			Various	Preliminary Scoped				
							7.19	**$5,913,840**
Cutout Arrester Program	Reliability "F	59	7206802	Additional Sectionalizing (fused cutouts)	6	each		
000016485		65	7208401	Additional Sectionalizing (fused cutouts)	5	each		
		69	7231503	Additional Sectionalizing (fused cutouts)	10	each		
		131	7216103	Additional Sectionalizing (fused cutouts)	12	each		
		189	7207302	Additional Sectionalizing (fused cutouts)	7	each		
			Various	Preliminary Scoped				
							40.00	**$16,544**
Sectionalizing Program	Reliability "F	42	7200502	Additional sectionalizing	5	each		
000004647		64	0002612	Install PME-11 UG SW	1	each		
		68	0002612	B-Zip & Sentient Fault Indicators	20	each		
		76	0002610	B-Zip & Sentient Fault Indicators	20	each		
		94	0001206	2022 BZIP - Reufuse / replace 12 cutout locations.	12	each		
		98	0011301	Elliott -1 - BZIP		each		
		105	0002904	2022 BZIP - Reufuse / replace 12 cutout locations.	12	each		
		112	0002203	B-Zip & Sentient Fault Indicators	20	each		
		114	0004613	Astor 4613 BZIP & Sentient Fault Indicators	30	each		
		118	0004609	Astor 4609 BZIP & Sentient Fault Indicators	30	each		
		125	0004614	Astor 4614 BZIP & Sentient Fault Indicators	30	each		
		127	7205302	Additional Sectionalizing (fused cutouts)	8	each		
		130	0003812	Sectionalizing. Add recloser. Add fuses. Refuse.	20	each		
		132	0021803	BZIP, LINCOLN CKT. F-21803 - YR. 2022	25	each		
		136	0004611	Astor 4611 BZIP & Sentient Fault Indicators	30	each		
		153	0002617	B-Zip & Sentient Fault Indicators	50	each		
		157	7423602	West Hebron Etna sectionalizing	2	each		
		161	7212102	Additional Sectionalizing (fused cutouts)	10	each		
		164	0002002	BZIP & Sentient Fault Indicators - Wilson F-2002	30	each		
		168	0024033	BZIP, DELAWARE CKT. F-24033 - YR. 2022	30	each		
		171	0005415	BZIP & Sentient Fault Indicators - Hess F-5415	30	each		
		174	0003201	BZIP & Sentient Fault Indicators - Fifth Ave F-3201	30	each		
		180	0005416	BZIP & Sentient Fault Indicators - Hess F-5416	30	each		
		181	0003134	Install VFI sectionaling on Powell Rd	1	each		
		183	0006413	BZIP & Senteint Fault Indicators- St. Clair F-6413	30	each		
		191	0001932	BZIP, HYATT CKT. F-1932 - YR. 2022	50	each		
		201	0009231	BZIP, MALISZEWSKI CKT. F-9231 - YR. 2022	50	each		
		207	0001407	high level install 1 recloser, 5-3phase sentient installations, 5 cutout locations	11	each		
		211	0024031	BZIP. DELAWARE CKT. F-24031 - YR. 2022	50	each		
		332	7513401	Additional Sectionalizing to reduce Breaker Zone. Pole 40810115000212: Install Viper	1	each		
		341	0010703	BZIP PROGRAM	5.59	miles		
		388	0003131	Install VFI sectionaling on Powell Rd	4	each		
		435	7517101	Highland Terrace / Maynard: Refuse line section	6	each		
		493	7423601	West Hebron Hebron install Viper	1	each		
		529	0024705	Miller Ln Sectionalizing and 2 phase Removal	0.44	miles		
		529	0018901	Install Electronic Recloser just outside fence to bypaas and remove Station Breaker	1	each		
		529	0018902	Install Electronic Recloser just outside fence to bypaas and remove Station Breaker	1	each		
		529	0000914	Install 2 reclosers	2	each		
		529	0000906	Add 2 GOABs	2	each		
		529	0003806	Groves 3806 Sectionalizing. Add two reclosers. Refuse. Rebalance (PHA 309 PHB 249 PHC 354)	30	each		
		529	7105604	Newcomerstown / Simonds: Recloser on Pole 40820286D10371	1	each		
			Various	Preliminary Scoped				
								$2,466,232
Pole Replace not Cycle Inspection	Reliability "F	247	7401403	Granville West pole replacement	10	each		
DROHPOLAP		481	7515401	BZIP Batesville / Quaker City	11	each		
		503	7421502	BZIP East New Concord / College	4	each		
		529	0000914	Pole Replacement	2	each		
		529	0000906	Pole Replacement	2	each		
			Various	Preliminary Scoped				
							29	**$589,344**
UG Line Extension	Reliability "F	367	7421602	Line Extention/single phaseTie	0.49	miles		
DRUGEXTA1								
							0.49	**$80,000**
Voltage Conversion	Reliability "F	392	7401109	Mt Vernon Downtown conversion	0.58	miles		
DROHCONAV		496	7103503	2021 Crystal Park 4 to 12kv conversion Phase 1	5	miles		
		512	7411803	Delta Conversion - Section 2 Central Portsmouth North	0.44	miles		
		515	7411802	Delta Conversion - Section 4 Central West Conversion	1.62	miles		
		516	7411801	Delta Conversion - Section 1 Central Portsmouth East	1.07	miles		
		529	0009231	OVERHEAD VOLTAGE CONVERSION	0.8	miles		
			Various	Preliminary Scoped				
							9.51	**$9,486,528**
Local Asset	Reliability "F	529	0014203	Corwin Load Balance	0.11	miles	**0.11**	
000007817		529	0000906	Add Sentients 2 locations	6	Eaach	**6**	
			Various	Preliminary Scoped				
								$124,826
URD Cable Rehab Replacement	Reliability "F		Columbus Various	Replace failed, end of life undergroud cables	95.86	miles		
DROHREPEE								
							95.86	**$16,570,000**
URD Cable Rehab Injection	Reliability "F		Columbus Various	Cable Injection Rejuvination	24.05	miles		
DROHINJEE								
							24.05	**$1,778,000**
Planning Distribution, Station & Transmission	Project "C"		Morse Rd Station	Install 1-13 kV circuit (F-5818)				
	Project "C"		Wayview Station	Install 1-25 KVA transformer & 3-12 kV circuits				
	Project "C"		Salerno Station	Install 1-30 MVA transformer & 2-12 kV circuits				
	Project "C"		Fifth Ave Station	Install 1-50 MVA (T2) & 2-13 kV circuits				
	Project "C"		Neffs Station	Upgrade with 12 MVA transformer and 2-12 kV circuits				
	Project "C"		Stetson Run Station	Install 1-20 MVA transformer & 2-12 kV circuits				
	Project "C"		Barnesville Station	Install 2-20 MVA transformers & 4-12 kV circuits				

Program	Category	Project Ranking	Station/Circuit	Description	Units	UOM	Program Total	Est Capital Cost
	Project "C"		Van Wert-East Circuit	Reconductor 3.3 kft of line				
	Project "C"		Poth Station	Install 2-50 MVA transformers & 8-13 kV circuits				
	Project "C"		White Rd Station	Install 1-50 MVA & 2-13 kV circuits				
	Project "C"		Shannon Station	Install 1-13 kV circuit				
	Project "C"		Babbitt Station	Install 1-50 MVA & 2-34.5 kV circuits				
	Project "C"		OSU Station	Install 1-13 kV circuit				
	Project "C"		Zuber Station	Install 2-13 kV circuits				
	Project "C"		Corridor Station	Install 1-34.5 kV circuit				
	Project "C"		Morse Rd Station	Install 1-13 kV circuit (F-5819)				
	Project "C"		Scio Station	Upgrade with 1-20 MVA and 2-12 kV circuits				
	Project "C"		Batesville Station	Upgrade with 1-20 MVA and 2-12 kV circuits				
	Project "C"		Mifflin Station	Install 1-13 kV circuit				
	Project "C"		Anchor Hocking Station	Install 1-20 MVA transformer & 4-12 kV circuits, convert 4 - 12 kV and remove 2-6.25 MVA transformers				
	Project "C"		West Malta Station	Rebuild 12 kV bus, install 3rd 12 kV circuit & SCADA				
	Project "C"		Giles Station	Install 1-50 MVA transformer & 2-13 kV circuits				
	Project "C"		Gomer Station	Install 1-10 MVA transformer & 2-12 kV breakers				
	Project "C"		Grace Station	Install 1-9.375 MVA & 2-12 kV circuits				
	Project "C"		Seel Station	Install 2-20 MVA transformers & 4-12 kV circuits				
	Project "C"		Meigs Station	Upgrade with 20 MVA transformer & add 1-12 kV circuit				
	Project "C"		Sumner Station	Install 1-20 MVA transformer, 2-12 kV circuits & convert 4 - 12 kV				
	Project "C"		Great Seal Station	Install 1-20 MVA transformer & 3-12 kV circuits				
	Project "C"		Parsons Station	Rebuild F-5701 distribution line				
	Project "C"		Quarry Rd Station	Install DMS/SCADA & Feeder Regs on 3 circuits				
	Project "C"		Highland Terrace Station	Rebuild with 1-20 MVA & 2-12 kV circuits				
	Project "C"		Ruby Station	Install 1-12 MVA transformer and 3-12 kV circuits (replacing Robyville Station)				
	Project "C"		Wilson & McComb Rehab	Wilson D-Station				
	Project "C"		Guysville Station	Install 1-20 MVA transformer & 4-12 kV circuits				
	Project "C"		Rarden, Otway & Mcdermott Stations	Purchase 2-station sites, install 1-25 MVA & 2-34.5 kV circuits, 2-9.375 MVA transformers and 4-circuits, remove three deteriorated stations.				
	Project "C"		West Gallion	Replace 2 breakers, asociated switches & add circuit switcher.				
								$65,000,197
Risk Mitigation	Risk & Asset "D"		Pole Inspection	Pole Replacement	7,906	each		**$15,811,923**
			Underground Distribution Inspection	Inspect URD Above ground structures	44831	each		
				URD Inspection Repair ~ Inspect above ground structures (padmounts, enclosures, pedestals, etc.)	5686	each		**$579,924**
			Overhead Line Inspection	Inspect overhead distribution lines	7,801	Dist (mi)		
				OH Circuit Inspection Repairs	24,967	JSH		**$2,543,967**
			Recloser Replacement	Overhead recloser replacement	637	each		**$3,848,410**
								$22,784,224

Program	Category		Program	Description	Units	UOM		
Network Rehab	Reliability "F"		Arc Flash Mitigation	Replace 480V network protectors with units that	18.00	each		
			PILC/Primary Mitigation	Replace underground conductor identified through program criteria.	2.24	miles		
			Network Transformer/Protector Replacement	Replace network transformer and protector assets identified as reaching the end of their engineered life based upon inspection results from	15.00	each		
			Banded Cable Replacement	Replace underground conductor idenfied with deteriorated neutral to improve reliabilitiy	1.62	miles		
			Manhole/Vault Civil Rebuilds	Replace deteriorated underground network civil structures that are identified based on results of the network asset inspection program.	10.00	each		
			MVI/Tru-Break Installations	Install primary load break vacuum switches at 480V locations for arc flash policy and reliability.	20.00	each		
			High Thermal Event System Installations	Install systems in 480V network vaults which will provide critical safety protection for AEP personnel and the public.	7.00	each		
			Other Network Reliability	Online DGA Transformer Monitoring Installations	12.00	each		
			Other Network Reliability	Installation of DTS and DAS systems at Vine Station	1.00	each		**$10,000,000**

Program	Category		Sub-Program	Description	Units	UOM		
Non-Network Rehab	Reliability "F"		Non-Network Electrical Renewal	Re-conductor identified underground station exit power cable	8.00	miles		
			Non-Network Civil Duct/MH Rehab	Replace distribution underground duct and manhole systems	8.00	miles		
			Other Non-Network Reliability	Arena district capacity improvements	1.30	miles		
			Other Non-Network Reliability	Arena district switchgear replacements and modernization	6.00	each		**$15,840,000**

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 *Direct Testimony of Thomas A. Kratt* was sent by, or on behalf of, the undersigned counsel to the following parties of record this 15th day of June 2020, via electronic transmission.

/s/ *Steven T. Nourse*
Steven T. Nourse

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Summary: Testimony -Direct Testimony of Thomas A. Kratt on Behalf of Ohio Power Company electronically filed by Mr. Steven T Nourse on behalf of Ohio Power Company