INDEPENDENT AUDIT OF THE RECONCILIATION RIDER OF DAYTON POWER AND LIGHT

Response to RFP No. RA20-PPA-2

FINAL REPORT

10/6/2020

Redacted

Vantage Energy Consulting, LLC
Management Consulting and Energy Services

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I. EXECUTIVE SUMMARY

Based on a September 14, 2018 application filing by DP&L to update the Reconciliation Rider (RR) in Case No. 18-1379- EL-RDR, Staff filed a review and recommendation in which Staff asked for approval of the application, as well as proposed new tariff language clarifying that the rider is subject to reconciliation, including refunds to customers, based on the results of audits approved by the Commission.

This report responds to an RFP, in which the Staff seeks a prudency audit to establish the prudency of all costs and sales flowing through the RR and to demonstrate that the Company's actions were in the best interest of retail ratepayers.[1] The RFP requires an independent audit of the RR for the period spanning November 1, 2018, through December 31, 2019. This report is the first audit of the RR and addresses the period defined above. As the analysis below demonstrates, DP&L was in compliance with the RR requirements.

The layout for the report is as follows. Please note that Chapters III – VIII adhere to the Scope of Investigation Subheadings in the RFP.

Chapter I – EXECUTIVE SUMMARY

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PROJECT SCOPE

The following scope was defined for this audit.

[1] The RFP states that any conclusions, results, or recommendations formulated by the auditor may be examined by any participant to the proceeding for which the audit report was generated. Further, it shall be understood that the Commission and/or its Staff shall not be liable for any acts committed by the auditor or its agents in the preparation and presentation of the audit report.

1. DISPOSITION OF ENERGY AND CAPACITY

a. The auditor shall review the prudency of unit scheduling and bidding of energy into PJM-administered wholesale markets, including day-ahead and real-time energy markets, and shall ensure that accounting procedures accurately and properly allocate revenues to ratepayers. The auditor is expected to possess a familiarity with all rules and regulations governing the rights and responsibilities of generating asset owners in PJM, including but not limited to PJM Manual 11.

b. The auditor shall review the prudency of bidding behavior in PJM-administered capacity markets, including the annual Base Residual Auction (BRA), and ensure that accounting procedures accurately and properly allocate revenues to ratepayers. The auditor is expected to possess a familiarity with all rules and regulations governing the rights and responsibilities of capacity providers in PJM, including but not limited to PJM Manual 18.

c. The auditor shall review the prudency of bidding behavior and/or participation in any other market that may provide revenue above and beyond that which is received in energy and capacity markets, including, but not limited to, PJM-administered ancillary services markets.

2. FUEL AND VARIABLE COST EXPENSES

The auditor shall ensure that all OVEC's fuel (i.e., coal) and variable operations and maintenance (O&M) related expenses were prudently incurred and properly allocated to DP&L. The auditor's investigation shall include a comparison between incurred fuel costs and market prices to evaluate the reasonableness of fuel expenses during the audit period.

3. CAPITAL EXPENSES

The auditor shall ensure that any fixed costs incurred by OVEC are properly allocated to DP&L, including depreciation, debt service, and plant maintenance expenses. The auditor is expected to ensure that only prudently incurred costs are included for recovery, and that any and all costs that have been deemed to be ineligible for recovery by the Commission have been appropriately excluded.

4. ENVIRONMENTAL COMPLIANCE

The auditor shall include, in the investigation, a review of DP&L's share of OVEC's environmental compliance activities, as they relate to fuel and reagent procurement and utilization. This review should include considerations such as (1) compliance with existing environmental regulations, and (2) preparation for compliance with any proposed or newly enacted environmental regulations.

The auditor shall analyze and address at least the following:

- the impact that compliance activities had on OVEC's fuel procurement strategy, as well as the type and cost of fuel that was purchased;

- overall emission allowance management strategy, including any emission allowance transactions in which OVEC participated;

- methods used to analyze compliance options and develop overall mitigation strategies.

5. POWER PLANT PERFORMANCE

The auditor shall review and report on significant plant outages or other degradations observed in the operating availability, equivalent availability, or capacity factors of OVEC's generating plants and their impact on ratepayers, and either make a recommendation to the Commission that further review is needed or undertake its own review to determine the reasonableness of OVEC and/or DP&L's actions. In addition, the auditor shall conduct an on-site investigation of at least one of OVEC's generating stations and report the resultant findings, conclusions and recommendations. Items to be covered during the station visitation include, but are not limited to, the following: fuel handling and quality control (i.e., weighing, sampling, scale calibrations, etc.), inventory surveying methodologies and results, performance monitoring (i.e., heat rate) and maintenance.

6. UTILITY INDUSTRY PERSPECTIVE

The auditor shall include in the audit report a discussion of the current dynamics of the PJM wholesale markets in which OVEC operates, and the impact that changing market dynamics have on OVEC's operations and practices.

SUMMARY OF RECOMMENDATIONS

After an in depth review of the process followed as well as a review of selected transactions, Vantage concluded that projects included and dollars associated with these projects were appropriate for the Reconciliation Rider. Detail on our analysis follows this conclusion. A summary of recommendations we are making to enhance the process are included below.

III-R1 **DPL should prepare a report for the Ohio PUC detailing the potential ancillary services that these plants could provide to PJM, along with the projected annual revenue. In addition, the report should discuss the reasons why these plants are not suitable to provide certain ancillary services, if applicable. (Priority: Medium)**

DPL, through its representation on the OVEC Operating Committee, should investigate and analyze the potential for the Clifty Creek and Kyger Creek Power Plants to participate in the PJM ancillary service markets in order to obtain additional revenue for ratepayers.

V-R1 **Examine small projects to clearly determine whether they are capital in nature.**

In 2018 there were seven projects with total costs under $100,000 each. DPL's share was $21,301. In 2019 there were six capital projects under $100,000 that totaled $30,775. Our

analysis did not attempt to verify the legitimacy of each of these small projects. Going forward DP&L should consider whether projects this small are O&M or capital.

V-R2 **Formally document the procedures for the calculation of cost recovery of OVEC capital costs and expenses in the RR.**

While management's process for calculating the reconciliation rider was well documented, there were no written procedures. To ensure application of a consistent process during periods of change or turnover, we recommend management formally document the procedures used in calculating the recovery of OVEC costs and expenses in the LGRR. Although the LGRR became effective after our audit period, Vantage recommends that DPL prepare a formal procedure documenting the workflow for the calculation of the LGRR. This formal procedure would be useful especially in these days of COVID 19 when key personnel may be unavailable during crucial times for the calculation of the LGRR. The procedure should give explicit recognition to various approvals during the process so that the filings at the PUC are consistent and as accurate as possible.

VI-R1 **The OVEC Operating Committee needs to continue to monitor the projected implementation of the regulations and the impact on OVEC operations.**

As changes in environmental regulations ae developed and made public, OVEC should communicate the impact to both its owners and regulatory commissions on a timely manner.

II. RECONCILIATION RIDER PURPOSE

PROCEDURAL BACKGROUND

A key document associated with this project is the "Amended and Restated Power Agreement Between Ohio Valley Electric Corporation and Indiana-Kentucky Electric Corporation"[2], dated September 10, 2010.[3] This document specifies delivery details, including points of delivery, power quality details, control technology such as communication, telemetering, frequency and/or tie-line control facilities essential to so minimizing such deviations. It states:

> "OVEC designed, purchased, and constructed, and continues to operate and maintain two steam-electric generating stations[4], one station (herein called Ohio Station) consisting of five turbo-generators and all other necessary equipment, at a location on the Ohio River near Cheshire, Ohio, and the other station (herein called Indiana Station) consisting of six turbo-generators and all other necessary equipment, at a location on the Ohio River near Madison, Indiana, (the Ohio Station and the Indiana Station being herein called the Project Generating Stations); and OVEC also designed, purchased, and constructed, and continues to operate and maintain necessary transmission and general plant facilities (herein called the Project Transmission Facilities) and OVEC established or cause to be established interconnections between the Project Generating Stations and the systems of certain of the Sponsoring Companies; and, OVEC entered into an agreement with Indiana-Kentucky Electric Corporation (herein called IKEC), a corporation organized under the laws of the State of Indiana as a wholly owned subsidiary corporation of OVEC, which has been amended and restated as of the date of this Agreement and embodies the terms and conditions for the ownership and operation by IKEC of the Indiana Station and such portion of the Project Transmission Facilities which are to be owned and operated by it."

It also addresses the process by which OVEC shall reimburse IKEC for the difference between:

[redacted]

[2] VEC DR 05, AMENDED AND RESTATED POWER AGREEMENTBETWEENOHIO VALLEY ELECTRIC CORPORATION ANDINDIANA-KENTUCKY ELECTRIC CORPORATION, dated September 10, 2010

[3] Agreement indicates it shall terminate upon the earlier of: (1) June 30, 2040 or (2) the sale or other disposition of all of the facilities of the Project Generating Stations or the permanent cessation of operation of such facilities

[4] VEC DR-04 September 10, 2010 Intercompany Agreement.

[redacted]

REGULATORY COMPLIANCE

Our audit approach relied upon direction from various accounting directives, including:

Generally Accepted Accounting Principles (GAAP) for Utilities

The GAAP is an accounting frame for proper classification and treatment of the financial transactions, i.e. transactions to be classified and recorded as assets, liabilities, revenues, costs and expenses. Its complexity in some cases allows flexibility in their interpretation. Generally, utilities' financial statements follow the GAAP requirements. Guidance related to the effects of rate regulations on certain accounting treatments are handled in (ASC) Codification Topic 980: Regulated operations in the Accounting Standards Codification (ASC) issued by the Financial Accounting Standards Board (FASB).

FERC Uniform System of Accounts

The Uniform System of Accounts (USofA) was established by the National Association of Regulatory Utility Commissioners (NARUC) and Federal Energy Regulatory Commissioners (FERC) to control accounting, prescribe accounting classifications, and instructions to achieve uniform accounting records, and maintain consistent application among companies. This is the basis to be used in the financial reports.

III. DISPOSITION OF ENERGY AND CAPACITY

A. PRUDENCY DEFINITION

Black's Law Dictionary defines Prudence as:

> *Carefulness, precaution, attentiveness, and good judgment as applied to action or conduct that degree of care required by the exigencies or circumstances under which it is to be exercised. Crouk v. Railway Co., 3 S. D. 93, 52 N. W. 420. This term, in the language of the law, is commonly associated with "care" and "diligence" and contrasted with "negligence." See those titles. Prudenter agit qui prsecepto legis ob- temperat. 5 Coke, 49. He acts prudently who obeys the command of the law.*[5]

From a utility regulatory perspective, the following description of the prudence standard, in our experience, has been adopted by regulators throughout the United States:

> *A modern articulation of the prudence standard is found in Re Pennsylvania Power Co., 85 Pub. Util. Rep. (PUR) 4th 323, 336 (Pa. PUC 1987) in which the Pennsylvania PUC set forth the standard as follows: Prudence is that standard of care which a reasonable person would be expected to exercise under the same circumstances encountered by utility management at the time decisions had to be made. In determining whether a judgment was prudently made, only those facts available at the time judgment was exercised can be considered. Hindsight review is impermissible.*
>
> *Imprudence cannot be sustained by substituting one's judgment for that of another. The prudence standard recognizes that reasonable persons can have honest differences of opinion without one or the other necessarily being 'imprudent'.*[6]

Because this audit applies a prudence test, our primary focus was not on outcome, although we did, as noted, perform random assessments of actual daily transactions for insight. Instead our focus was on decision-making processes, organizational structure and functionality, and oversight of the OVEC by the Operating Committee.

III-F1 **In summary, we did not find DPL to be imprudent in its oversight responsibilities of OVEC as it relates to the disposition of energy, capacity and ancillary services.**

B. DISPOSITION OF ENERGY

DPL owns 4.9 percent of the Ohio Valley Electric Corporation (OVEC). In turn, OVEC owns and operates two base load coal fired generating plants, Kyger Creek and Clifty Creek, with

[5] Black's Law Dictionary

[6] *"PRUDENCE" IMPLICATIONS OF NUCLEAR PLANT DECOMMISSIONING*, John C. Person, Person & Craver LLP, March 2000

a total nameplate capacity of 2,490 megawatts. In total, these two facilities consist of 11 generating units each with a net generating capability of approximately 205 MW. OVEC is responsible for operating and maintaining the plants and for its bidding and scheduling into the PJM day ahead and real time markets. The process by which OVEC participates in the PJM energy markets are specified in the "Operating Procedures" pursuant to Section 9.05 of the Amended and Restated Inter-Company Power Agreement.[7]

Daily scheduling of the OVEC plants is managed by OVEC under the supervision of the Sponsoring Companies (the Owners) via the Operating Committee as described below.

> 9.05. *Operating Committee. There shall be an "Operating Committee" consisting of one member appointed by the Corporation and one member appointed by each of the Sponsoring Companies electing so to do; provided that, if any two or more Sponsoring Companies are Affiliates, then such Affiliates shall together be entitled to appoint only one member to the Operating Committee. The "Operating Committee" shall establish (and modify as necessary) scheduling, operating, testing and maintenance procedures of the Corporation in support of this Agreement, including establishing:*
>
> - *procedures for scheduling delivery of Available Energy under Section 4.03,*
> - *(ii) procedures for power and energy accounting,*
> - *(iii) procedures for the reservation and scheduling of firm and non-firm transmission service under the Tariff for the delivery of Available Power and Available Energy,*
> - *(iv) the Minimum Generating Unit Output, and*
> - *(v) the form of notifications relating to power and energy and the price thereof.*
>
> *In addition, the Operating Committee shall consider and make recommendations to Corporation's Board of Directors with respect to such other problems as may arise affecting the transactions under this Agreement. The decisions of the Operating Committee, including the adoption or modification of any procedure by the Operating Committee pursuant to this Section 9.04, must receive the affirmative vote of at least two-thirds of the members of the Operating Committee, regardless of the number of members of the Operating Committee present at any meeting.*

Our interview with representatives of DPL as well as our detailed review of the materials provided were the basis for our assessment of the prudent management of DPL as it relates to the disposition of energy from the OVEC power plants.

[7] VEC-4, page 18

OVERVIEW

The Clifty Creek and Kyger Creek Power Plants are owned and operated by Ohio Valley Electric Corporation (OVEC). OVEC was formed in 1952 to serve as a holding company for on behalf of multiple corporate shareholders (referred to as Sponsoring Companies).

OVEC manages the day-to-day operations of the plants, while consulting with the Sponsoring Companies on operational details. During the conference call held by the auditors with DPL staff on August 20, 2020, DPL explained that they have limited involvement in making operational decisions for the plants in coordination with the Sponsoring Companies.

OVEC maintains a PJM account to manage scheduling for both the Clifty Creek and Kyger Creek plants. Unit costs for each plant are updated in the PJM account roughly once per month, based upon changes in fuel costs.

Each morning OVEC will conduct a conference call with both plants to understand the operating conditions and project the amount of available power. OVEC then submits the plant schedules into the PJM Market Gateway system. For PJM-member Sponsoring Companies, OVEC normally bids their generation share of each plant as "must-run" in PJM's Day-Ahead market.

DPL receives it's share of PJM market revenue (and charges) directly from PJM in DPL's PJM account(s). DPL staff state that DPL receives monthly invoices from OVEC for their share of fuel and operating expenses.

FINDINGS

III-F2 **While managing power plants and bidding into competitive regional markets is a complicated process, it is made more complex by having multiple ownership stakes and interested parties.**

Having an entity such as OVEC handle operations and market engagement on behalf of all Sponsoring Companies is prudent and produces the benefit to ratepayers of having a more objective decision-making process. DPL is kept advised of important developments by OVEC, including via a daily "Morning Generation Report"[8], although it does not have full control of operations.

[8] VEC-09, page 23

III-F3 **OVEC maintains a comprehensive set of Operating Procedures for daily energy market scheduling, as provided to the auditors[9].**

OVEC's operating procedures reflect a diligent approach to operational decision-making and market scheduling.

In response to VEC-09, DPL responds:

> "OVEC develops its day-ahead and real-time energy market offers according to PJM Manual 15. OVEC self-schedules its units in accordance with the OVEC Operating Agreement, as approved by an Operating Committee consisting of representatives of the ICPA participants. ICPA participants, including DPL, do not have access to and cannot view hourly offer history. They only can view their respective ownership share of market awards. This ensures that competing OVEC owners are kept at arm's length."

OVEC also maintains a detailed set of procedures documents for several of the significant daily tasks related to the above-named Operating Procedures, provided to the auditors in VEC-09[10]. The auditors find that the operational processes and procedures undertaken by OVEC on behalf of the Sponsoring Companies to be prudent.

CAPACITY MARKETS

Vantage addressed the prudency of DPL bidding behavior in the PJM administered capacity markets, including the annual Base Residual Auction or BRA. PJM Manual 18: PJM Capacity Market[11] is referred to as one of the key sources that the auditor should reference.

The PJM describes the capacity market participation as follows:

> *Participation in the PJM Capacity Market Participants in the PJM Capacity Market, both Load Serving Entities and resource providers, must comply with all applicable provisions of the PJM Open Access Transmission Tariff, PJM Operating Agreement, and the PJM Reliability Assurance Agreement. PJM Capacity Market participants must be signatories of the appropriate Agreements and Full Members of PJM. All participants must comply with the procedures and requirements as set forth by these agreements and in PJM Manuals. 1.2.1 Participation of Load Serving Entities Participation by Load Serving Entities (LSEs) in the RPM for load served in the PJM region is mandatory, except for those LSEs that have elected the Fixed Resource Requirement (FRR) Alternative and submitted an approved FRR Capacity Plan for their load served in an FRR Service Area. Under RPM, each LSE that serves load in a PJM Zone during the Delivery Year shall be responsible for paying a Locational*

[9] DR VEC-09

[10] DR VEC-09

[11] PJM Manual 18 -- Revision: 40 Effective Date: February 22, 2018

> *Reliability Charge equal to their Daily Unforced Capacity Obligation in the Zone multiplied by the Final Zonal Capacity Price applicable to that Zone. LSEs may choose to hedge their Locational Reliability Charge obligations by directly offering and clearing resources in the Base Residual Auction and Incremental Auctions or by designating self-supplied resources (resources directly owned or resources contracted for through unit-specific bilateral purchases) as self-scheduled to cover their obligation in the Base Residual Auction. Such action may wholly or partially offset an LSE's Locational Reliability Charges during the Delivery Year depending upon how the clearing prices of the resources compare to the Final Zonal Capacity Prices that apply to their unforced capacity obligations.*

The PJM further defines the Fixed Resource Requirement or FRR as an alternative option for securing its capacity requirements available to Load Serving Entities like DPL. The PJM describes the FRR process as follows:

> *The purpose of the Fixed Resource Requirement (FRR) Alternative is to provide a Load Serving Entity (LSE) with the option to submit a FRR Capacity Plan and meet a fixed capacity resource requirement as an alternative to the requirement to participate in the PJM Reliability Pricing Model (RPM), which includes a variable capacity resource requirement. The FRR Alternative allows an LSE, subject to certain conditions, to avoid direct participation in the RPM Base Residual Auctions and the Incremental Auctions; however, such LSE is required to submit a FRR Capacity Plan to satisfy the unforced capacity obligation for all loads in an FRR Service Area, including all expected load growth in the FRR Service Area. An LSE serving load in an FRR Service Area under the FRR Alternative does not pay an RPM Locational Reliability Charge. The portions of capacity resources included in an LSE's FRR Capacity Plan do not receive any RPM Resource Clearing Prices.*

FINDINGS

III-F4 **DPL, through its ownership share of OVEC, bids annually into the PJM Reliability Pricing Model (RPM) Auctions for their share of the generation capacity of Clifty Creek and Kyger Creek Power Plants.**

In a discussion with DPL August 20, 2020, OVEC staff confirmed that OVEC plays no role in the PJM RPM Auction process. OVEC also has no knowledge of DPL's decision-making or financial outcomes. DPL staff on the call also confirmed that they make all decisions related to the RPM auctions and that all revenue related to RPM Auctions flows directly to DPL.

III-F5 **DPL provided a document that contained analysis and recommendations for the 2017-2018 Base Residual Auction. We find that DPL reasonably determined their bidding strategy for their generation capacity of Clifty Creek and Kyger Creek Power Plants into the auction.**

In Data Request VEC-10, DPL provides a PowerPoint presentation of strategy around bidding assets into the 2017-2018 PJM Base Residual Auction ("BRA"), including for Clifty Creek and Kyger Creek Power Plants [redacted]

[redacted]. Vantage finds that this determination is the correct approach to offering DPL's share of capacity into the PJM BRA.

III-F6 **DPL's bidding strategy into PJM Base Residual Auctions has resulted in all available plant capacity clearing in the auction for the five years studied by auditors, allowing DPL to achieve maximum available revenue from the PJM capacity markets during this period.**

In the response to Data Request VEC-56, DPL shows that all units of Clifty Creek and Kyger Creek Power Plants cleared the PJM Base Residual Auction at their entire offer volume for the following years: 2017-2018, 2018-2019, 2019-2020, 2020-2021, and 2021-2022.

Vantage therefore concluded that there is no evidence that the actions taken by DPL with relation to the PJM Reliability Pricing Model were improper, and we conclude that the company is acting prudently.

ANCILLARY SERVICE MARKETS

The third area of PJM market review addressed the bidding behavior and/or participation in any other market that may provide revenue above and beyond that which is received in energy and capacity markets, including, but not limited to, PJM administered ancillary services markets.

PJM offers the following description of its ancillary services markets.

Ancillary Services

> *"Ancillary services help balance the transmission system as it moves electricity from generating sources to retail consumers. Throughout the day, PJM operates markets to procure two important ancillary services: regulation and reserves.*
>
> *Balancing the system means matching supply and demand while maintaining a system frequency of 60 Hertz. Several factors can impact supply/demand balance and the system frequency, similar to the careful balancing of a scale. Regulation and reserves work together to maintain this balance, but have different roles:*[12]
>
> - *Regulation is used to control small mismatches between load (the electricity being consumed) and generation (the electricity being produced), adjusting for small tips to either side of the scale.*
> - *Reserves help to recover system balance by making up for generation deficiencies if there is loss of a large generator, resulting in a large tip in the scale.*

[1212] https://www.pjm.com/markets-and-operations/ancillary-services.aspx

Regulation Market

As an ancillary services product, regulation provides market-based compensation to resources that can adjust output or consumption in response to an automated signal.

Regulation is a reliability product that corrects for short-term changes in electricity use that might affect the stability of the power system. In technical terms, the main goal of regulation is to keep the system's area control error, also called ACE, within acceptable bounds. ACE is the difference between scheduled and actual electrical generation, accounting for variations in the system's frequency.

Regulation helps match generation and demand to keep the grid functioning normally by:

- *Maintaining a system frequency of 60 Hertz*
- *Tracking moment-to-moment fluctuations in customer electricity use*
- *Correcting for unintended fluctuations in generation (such as a large generating unit disconnecting from the system)*

Managing differences between forecasted or scheduled power flow and actual power flow on the system.

As an ancillary services product, regulation provides market-based compensation to resources that have the ability to adjust output or consumption in response to an automated signal.

PJM generates two different types of automated signals that Regulation Market resources can follow.

- *The Regulation D signal is a fast, dynamic signal that requires resources to respond almost instantaneously.*
- *Regulation A is a slower signal that is meant to recover larger, longer fluctuations in system conditions.*

These two signals communicate with each other and work together to match the system need for regulation.

Regulation resources follow either the Regulation A or the Regulation D signal, depending on their characteristics and capabilities. As system conditions change throughout the day, different quantities of each of these resources are needed at any given time.

Reserves

Generation reserves are the electricity supplies that are not currently being used but can be quickly available in the case of an unexpected loss of generation. Think of a spare tire – a backup when you need it. The types of reserves are:

***Operating Reserve** – The amount of power that can be received within 30 minutes. This power can be from:*

- *Generators that are synchronized (connected) to the power grid or offline*
- *Certain loads, designated as demand side response, which can be removed from the grid*

***Primary Reserve** – The amount of power that can be received within 10 minutes. This power can be from:*

- *Generators that are synchronized to the power grid or offline*
- *Certain loads, designated as demand side response, which can be removed from the grid*

***Synchronized Reserve** – The amount of power (connected to the grid) that can be received within 10 minutes. This power can be from:*

- *Generators that are synchronized to the power grid*
- *Certain loads, designated as demand side response, which can be removed from the grid*

***Quick Start Reserve** – The amount of power that can be received within 10 minutes from generators that are offline*

***Supplemental Reserve** – The amount of power that can be received within 10 to 30 minutes. This power can be from:*

- *Generators that are synchronized to the power grid or offline*
- *Certain loads, designated as demand side response, which can be removed from the grid"*

Vantage posed the following question to DPL in VEC-52:

> "Confirm whether OVEC is bidding or participating in any other market that may provide revenue above and beyond that which is received in energy and capacity markets, including, but not limited to, PJM-administered ancillary services markets."

DPL provided the following response to VEC-52:

> "OVEC has a Delegation of Authority in place with the Sponsors who are participants in the PJM market and offer the energy into the market on their behalf. OVEC does not bid Capacity into the capacity markets, as the Sponsors establish their own positions in the Capacity markets. OVEC does not presently participate in the Ancillary Services market, other than the Spinning Reserve market. OVEC is in the process of reviewing the associated costs and benefits of participation in the Ancillary Services Markets."

Further, in a videoconference with DPL personnel held on August 20, 2020, DPL told the auditors that they are not sure about the level of OVEC's involvement with PJM Ancillary

Services Markets and are unsure on the amount of revenue that may or may not be obtained by OVEC on behalf of the Sponsoring Companies. DPL staff further stated that it would be the responsibility of OVEC to evaluate the cost and benefit of participating in additional ancillary service markets with the OVEC plants.

FINDINGS

III-F7 **OVEC is not currently participating in the PJM ancillary services market.**

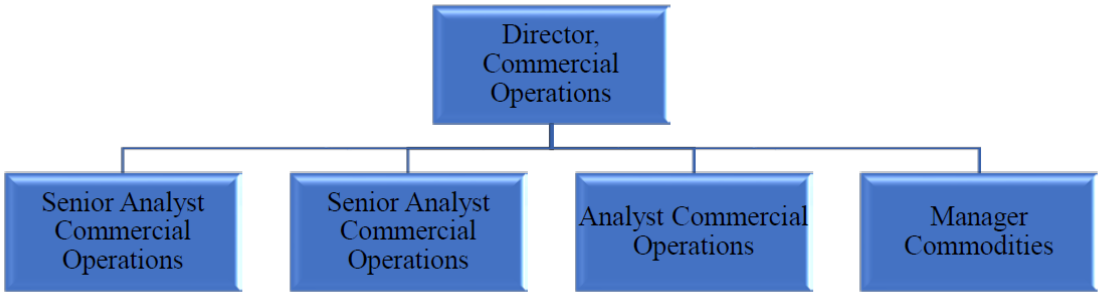
DPL has provided no evidence that OVEC is currently participating in any ancillary service markets. In both written response to VEC-52 and during a videoconference DPL personnel have expressed no knowledge of OVEC using Clifty Creek or Kyger Creek Power Plants to participate in the PJM ancillary service markets.

RECOMMENDATIONS

III-R1 **DPL should prepare a report for the Ohio PUC detailing the potential ancillary services that these plants could provide to PJM, along with the projected annual revenue. In addition, the report should discuss the reasons why these plants are not suitable to provide certain ancillary services, if applicable. (Priority: Medium)**

DPL, through its representation on the OVEC Operating Committee, should investigate and analyze the potential for the Clifty Creek and Kyger Creek Power Plants to participate in the PJM ancillary service markets in order to obtain additional revenue for ratepayers.

Exhibit III-1
Market Operations Staff [13]



The controlling document relating to compliance with PJM's Capacity Performance product is the PJM Open Access Transmission Tariff, Attachment DD. Attachment DD beginning at section 5.5A. See https://www.pjm.com/library.aspx . Additional documents relating to the Capacity Performance product may be found at https://www.pjm.com/markets-and-

[13] DR7

operations/rpm.aspx . See also, PJM Reserve Manuals collected at https://www.pjm.com/library/manuals.aspx .[14]

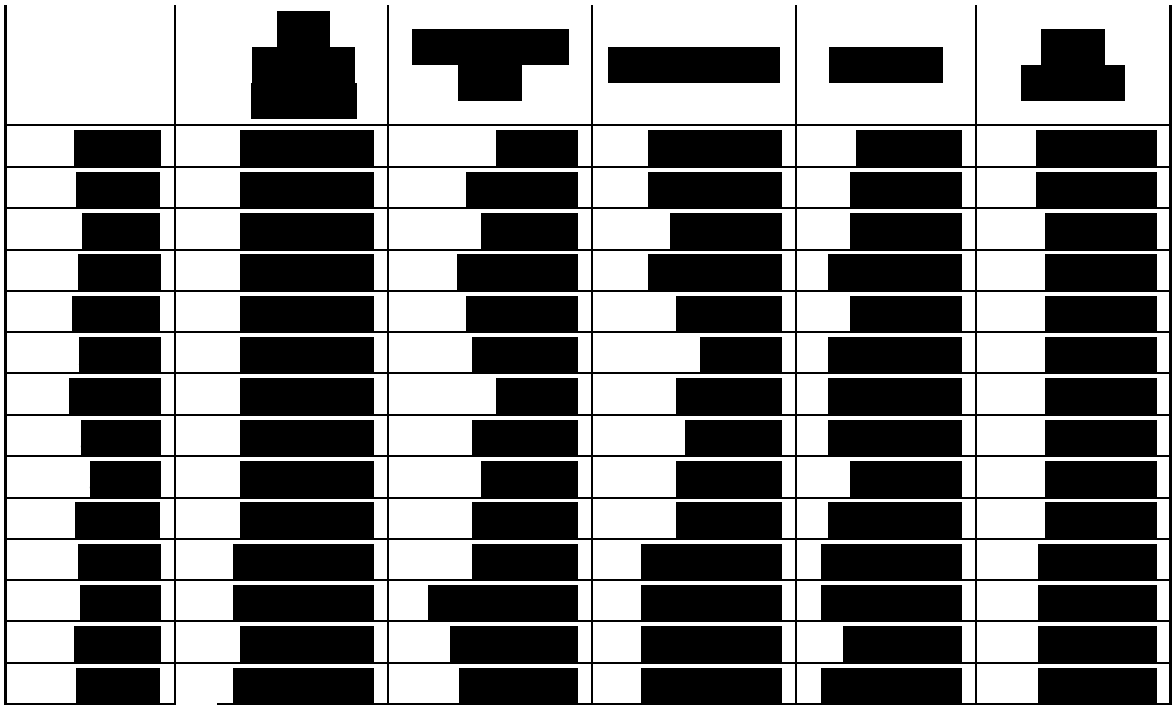
ARTICLE 1

The "AMENDED AND RESTATED POWER AGREEMENT BETWEEN OHIO VALLEY ELECTRIC CORPORATION AND INDIANA-KENTUCKY ELECTRIC CORPORATION (IKEC)" which was last updated on March 13, 2006 describes the power agreement process. Key provisions include:

[redacted]

[14] DR3

Exhibit III-2
DP&L Deferral and Net OVEC Costs



From DPL Deferral and Net OVEC Costs, Source: VEC 5-3
Need Sep – Dec info. Was not provided in DR VEC-5-3

IV. FUEL AND VARIABLE COST EXPENSES

REVIEW OF MONTHLY PJM BILL ALLOCATION

IV-F1 **Calculation of monthly PJM bill allocation was conducted in a straightforward manner and our review of the process and sampling of specific months found no errors or anomalies.**

Vantage reviewed PJM billing allocation for reasonableness for a number of months. The PJM bill Allocation file includes a number of pages of information.

The January 2019 entry is typical and includes:

Title: Journal Entry Name: - JE02-32[15]-To Record the Over/Under Collections of the Reconciliation Rider

Comments:

Entry is to defer OVEC charges incurred during the current month net of any revenues received via sales of OVEC power in PJM. Deferral will be offset by billed revenues for the reconciliation rider. This rider was approved in the ESP, Cause No. 16-395. The rider is effective November 1, 2018. We expect OVEC expenses to be between $2 [16]and $3 million per month and expect the PJM revenues to be no more than $2.3 million per month. Amounts to include in the deferral were based on OVEC cost per the general ledger activity for the month netted against the net revenue on the PJM LSE bill. Deferral authority is based on DPL's 2017 ESP Order where a new tracker was authorized for on-going costs. Each working paper has the name of the Preparer and the Approver.

Four GL Accounts/Customer/Vendor accounts are included:

- 5131100010, Record Deferral of Current Mth OVEC Net Costs
- 1172100002 Record Deferral of Current Mth OVEC Net Costs
- 5131100010 Record True-up of Prior Mth deferral of OVEC Nets Co
- 1172100002 Record True-up of Prior Mth deferral of OVEC Nets Costs

[15] VEC 5, JE-02-32-0119

[16] Data included in VEC-5 is deemed confidential

The PJM Bill Allocation is provided which distributes allocation into the following categories:

Exhibit IV-1
PJM Billing Items

Charge Number	PJM Billing Items	FERC Account
1200	Day-ahead Spot Market Energy	5555001
1205	Balancing Spot Market Energy	5555001
1210	Day-ahead Transmission Congestion	5655001
1215	Balancing Transmission Congestion	5655001
1220	Day-ahead Transmission Losses	5655002
1225	Balancing Transmission Losses	5655002
1375	Balancing Operating Reserves Charges - LOAD	5555006
1376	Balancing Operating Reserve for Load Response	5555006
1661	Capacity Resource Deficiency	5555012
1665	Peak-Hour Period Availability	5555013
1375A	Balancing Operating Reserves Charges - OVEC	5555006
1376A	1376A Balancing Operating Reserve for Load Response	5555006
1999A	PJM Customer Payment Default	5565019

V. CAPITAL EXPENSES

Capital costs incurred by OVEC are allocated and billed to DPL through the Inter-Company Power Agreement (ICPA) [17]. The company reviews the capital expenses to determine that only prudently incurred costs are included for recovery, and that any and all costs that have been deemed to be ineligible for recovery by the Commission have been appropriately excluded.

OVEC allocates capital costs, and all other "Demand Costs" per the Inter-Company Power Agreement (ICPA). Demand Costs are all non-fuel costs and per the ICPA, the Sponsors are required to reimburse OVEC for all Demand costs as they are incurred. For that reason, excluding major environmental capital projects, all capital costs are billed to Sponsors as they are incurred (on cash flow basis and not a deprecation or amortized basis).

CAPITAL EXPENSES

During 2018 and 2019, OVEC incurred capital expenses of $19,239,150. DPL's allocated portion of this expense was $942,718.[18] OVEC records capital expenses consistent with FERC's Uniform System of Accounts and procedures set forth in the ICPA. OVEC's capital expenses are converted into an annualized amount that is charged to DP&L based on its 4.9% ownership share."[19] In response to data requests about the recovery of OVEC capital expenditures, DPL states "OVEC's capital expenditures are approved via procedures set for in the Inter-Company Power Agreement (ICPA). All approved OVEC capital expenditures are eligible for cost recovery through the RR." [20] OVEC allocates capital costs, and all other "Demand Costs" per the Inter-Company Power Agreement (ICPA). Demand Costs are all non-fuel costs and per the ICPA, the Sponsors are required to reimburse OVEC for all Demand costs as they are incurred." The Power Participation Ratio for DPL is 4.90%.

DPL further states per the Inter-Company Power Agreement (ICPA), all of OVEC's capital expenditures are allocated and billed to the Sponsors based on their "power participation ratio" and the Sponsors are obligated to reimburse to OVEC for expenses as they are incurred. The PPA does not provide for any provision to exclude specific types of capital expenditures made by OVEC and billed to the Sponsors." Consequently, per DPL there were no OVEC capital expenditures that were determined to be ineligible for recovery through the RR. [21] In other words, DPL and the other Sponsors cannot challenge any capital expenditure incurred by OVEC and the Sponsors must reimburse OVEC their allocated

[17] Data Request 4- Attachment 4-1 – Inter-Company Power Agreement

[18] Data Request 33- Attachment 1 - OVEC capital expenses for 2018 and 2019

[19] Data Request 30- Procedures pertaining to the allocation and recording of OVEC capital expenses

[20] Data Request 31- Cost recovery of OVEC capital expenses through ICPA

[21] Data Request 38 – Ineligible OVEC costs for recovery.

portion of the capital expenditures. However, through the OVEC Committees the Sponsors can provide input to decisions regarding capital expenditures.

The OVEC costs recovered in the RR are monitored monthly through the process of calculating the entry to record the Over/Under Collections of the Reconciliation Rider. Throughout the month DPL accumulates capital and "demand costs" in specific general ledger accounts. During the monthly RR reconciliation process those costs are pulled from the general ledger and included in the monthly calculation. While the monthly RR process is not formally documented, the monthly packet with the calculations is very uniform. The workbook tabs include references to where the source documents were obtained, references to the general ledger accounts and references to individuals from whom the documents can be obtained. The calculation is prepared by one individual and reviewed by another. Per discussion with management, the process works smoothly. No issues were noted during our review of the January 2019 workbook or the November 2019 workbook. This separate reconciliation rider ran through December 2019. Thereafter, these costs began to be recovered through a different mechanism called the Legacy Generation Resource Rider (LGRR). Since the costs are still being recovered, we recommend management formally document the procedures for the new LGRR calculation.

While[22] DP&L does not have any written formalized procedures for the calculation of the RR, there are several normal course of business steps to identify appropriate costs and calculate the RR. First, the Settlements Manager in the Accounting team reviewed line items on PJM's bill to identify and properly record items related to OVEC. That information was provided to Regulatory Accounting and Regulatory Operations to use for the true-up of actual expenses. The Regulatory Operations team included forecast net costs/revenues of OVEC for the upcoming rate period in the rider schedules. Regulatory pulled sales and demand information to develop allocations. The Accounting data is used to reconcile the previous period comparing actual costs and revenue, this step is performed and recorded monthly by Regulatory Accounting. The allocation data and forecast cost data was used to set the rate for the upcoming period. Regulatory Operations input those items into the schedules and developed the filing that was submitted to the PUCO.

The implications for this audit are that in order to evaluate the reasonableness and prudency of the incurred capital expenses the audit would have to examine the actual capital projects during the audit period.

AUDIT OF CAPITAL EXPENSES

As a first step of the audit, a request for a listing of all of the OVEC capital projects for 2018 and 2019 that involved of DPL.[23] The list identified 24 capital projects. The following tables provide the list of projects.

[22] From DR 16 which asks for procedures related to RR

[23] Data Request 33 - List of capital projects for 2018 and 2019

Exhibit V-1
Capital Expenditure - Plan Year 2018

Exhibit V-2
Capital Expenditure - Plan Year 2019

V-F1 **A review of the list of projects defined as "capital" raises questions about a number of small projects that could be considered maintenance.**

There were thirteen capital projects identified for 2019 for DP&L. Seven of these projects had expenditures that are considered minor projects (defined as less than $500,000). These projects, in fact, were less than less than $100,000 each, and less than $4000 when allocated for DP&L.

The total amount of expenditures allocated to DP&L for the seven projects under $100,000 each totaled $21,736. In other words, only 4.45% of the $478,458 in capital projects billed to DP&L

V-R1 **Examine small projects to clearly determine whether they are capital in nature.**

In 2018 there were seven projects with total costs under $100,000 each. DPL's share was $21,301. In 2019 there were six capital projects under $100,000 that totaled $30,775. Our analysis did not attempt to verify the legitimacy of each of these small projects. Going forward DP&L should consider whether projects this small are O&M or capital.

ANALYSIS OF SELECTED PROJECTS

For the audit, four projects were selected for detailed examination. The projects were:

Exhibit V-3
Selected Projects for Review

For the sample items listed above, Vantage requested supporting documentation justifying the need for the capital asset addition, the cost estimate, analysis of budget to actual for the expenditure and the depreciation schedule. In Data Request #61, DPL supplied the supporting documentation. The following table provides the original estimate and the final cost for the four projects. [24]

[24] Data Request #61- Sample for capital costs.

Exhibit V-4
Four Sample Capital Projects for Detailed Review

In addition, the following procedures regarding processing of capital costs was provided:

> "For analysis of budget vs actual, the projects were inside 5% (+/-) of the budgeted amount, OVEC requires justification and approval for variances of 10% or greater. OVEC's accounting for depreciation aligns with the Inter-Company Power Agreement. OVEC bills for non-financed projects during the life of the project. Each month OVEC bills the actual costs incurred for the project. When the project is completed it is closed to "plant in service", at that time as all of the costs have been recovered and the asset is considered fully depreciated." [25]

As noted above, the projects selected above had less than a 10% variance; therefore, required no follow up.

V-F2 **OVEC employs a budgeting procedure that is fairly standard for the industry.**

OVEC employs a budgeting procedure comparable to that used by other utilities.[26] After a project is approved and a project number is assigned all project related costs are tracked through the project number. The budget request includes:

- General project information – location, project type, project title, requested by
- Project description
- Information regarding whether the project will require an outage
- Alternatives considered
- Assumptions

[25] Data Request #61 – Justification/Analysis of Capital Expenditures

[26] Data Request #61 – Attachments 1-4 OVEC/IKEC Project Data Sheet

- Construction and operating budget material and labor worksheet
- Expected operating economic factors; including annual cash flows and expected annual expected savings
- Economic justification cost benefit summary included expected internal rate of return.

When a project is completed, a completion report and all associated workpapers, project data sheet, cost analysis, and economic justification are assembled and filed.

SELECTED PROJECT DESCRIPTIONS

[redacted]

[27] Data Request #61 – Attachment 61- 1 OVEC/IKEC Project Data Sheet

[28] Data Request #61 – Attachment 61- 4 OVEC/IKEC Project Data Sheet

FINDINGS

This section of the report provides our findings with regard to the process for approval of capital projects, the tracking of costs, the billing for the costs and the reasonableness and prudency of the capital expenditures during the audit period.

V-F3 **OVEC's billing of its capital expenses for the Sponsors is consistent with the ICPA.**

The power agreement specifies that OVEC bill each of the Sponsors their allocated portion of the expense based on its power participation ratio. The ICPA is an agreement among the Sponsors and its reasonableness was not subject to the audit.

V-F4 **The capital expenses billed during the audit period and passed through the PPA were reasonable and prudent.**

The OVEC capital expenditures billed to DPL and recovered through the RR were the result of a detailed and well-documented process. The billing was consistent with the terms of the ICPA. However, it should be pointed out that the projects all assumed the continued operation of the OVEC units. Our review was not in a position to question that assumption. Given that assumption, the OVEC capital expenditures are reasonable and prudent for the continued operation of the plants.

V-F5 **The approval and budgeting process used by OVEC is appropriate and consistent with processes used by other major utilities**

Once a needed capital project is identified, a detailed cost estimate is prepared. A project number is associated with the project and the project is budget approved. After work on the project begins all costs are tracked and accumulated by the project number. The process

[29] Data Request #61 – Attachment 61- 2 OVEC/IKEC Project Data Sheet

although well-defined is not optimum for the size of the capital budget and the need for transparency of decision making. The monthly packet is uniformly prepared with references to source documents and contacts. This process is typical of the process we have witnessed at other utilities and find it to be effective.

V-R2 **Formally document the procedures for the calculation of cost recovery of OVEC capital costs and expenses in the RR.**

While management's process for calculating the reconciliation rider was well documented, there were no written procedures. To ensure application of a consistent process during periods of change or turnover, we recommend management formally document the procedures used in calculating the recovery of OVEC costs and expenses in the LGRR. Although the LGRR became effective after our audit period, Vantage recommends that DPL prepare a formal procedure documenting the workflow for the calculation of the LGRR. This formal procedure would be useful especially in these days of COVID 19 when key personnel may be unavailable during crucial times for the calculation of the LGRR. The procedure should give explicit recognition to various approvals during the process so that the filings at the PUC are consistent and as accurate as possible.

VI. ENVIRONMENTAL COMPLIANCE

OVEC UNITS OPERATION

Through the past 40+ years the environmental controls of the OVEC units have been continually upgraded to assure full compliance with the associated Federal and State regulations as well as efficient operation. Below are some of the key performance indicators for the plants over the last 5 years. The Performance Profile[30] and performance data presented in Chapter 7 of this report provide detail; on the consistency of unit operation.

VI-F1 **During the past 5 years the OVEC units have continued to perform reliably and efficiently.**

Although the OVEC units are older, they continue to perform in a reliable, dependable and efficient manner. Over the 5-year period reviewed above, it is clear performance of the units has not deteriorated in any significant way.

ENVIRONMENTAL COMPLIANCE

To assess the status of the OVEC generating facility's environmental compliance during the audit period, the following regulatory areas have been reviews:

USEPA Mercury and Air Toxics Standard (MATS).

USEPA Cross State Air Pollution Rule (CSAPR).

USEPA Greenhouse Gas Regulations (GHG).

USEPA National Ambient Air Quality Standard (NAAQS) for ozone.

USEPA National Ambient Air Quality Standard (NAAQS) for PM2.5

USEPA Start-up, Shutdown Malfunction (SSM) Exemptions.

USEPA Coal Combustion Residual Regulation (CCR).

USEPA Effluent Limitation Guidelines (ELG).

USEPA Clean Water Act Section 316(b).

Based on a review of DPL's responses to Vantage's data requests, the following is a summary of the current status of OVEC's environmental compliance of the above regulations.

[30] DR 44 – Performance Profile

MERCURY AND AIR TOXICS STANDARD (MATS)

With the installation of the scrubbers, all of the OVEC generating Units are currently in full compliance with the MATS standard.[31]

CROSS STATE AIR POLLUTION RULE (CSAPR).

During the audit period, all of the OVEC generating units held sufficient allowances to meet the allowance surrender obligations for each applicable budget program for annual SO2, annual NOx, and seasonal NOx.[32]

GREENHOUSE GAS REGULATIONS (GHG)

Each of the OVEC generating facilities continued to meet their reporting obligations under the Greenhouse Gas Reporting Program. No other greenhouse gas regulations were applicable during the audit period.[33]

NATIONAL AMBIENT AIR QUALITY STANDARD (NAAQS) FOR OZONE

NOx contributes to the formation of ozone in the atmosphere including regional ambient air non-attainment areas. During the audit period, each facility operated in compliance with the applicable requirements for NOx emissions under the state implementation plans, and complied with the NOx annual and ozone season allowance surrender requirements under the CSAPR federal implementation plan.[34]

NATIONAL AMBIENT AIR QUALITY STANDARD (NAAQS) FOR PM2.5

The facility's PM2.5 emissions combine with the secondary particles of PM2.5, that can be formed in the atmosphere, to contribute to regional ambient air PM2.5 emissions. During the audit period, each facility operated in compliance with the applicable requirements for PM, SO2, and NOx and therefore was in compliance with NAAQS for PM2.5.[35]

START-UP, SHUTDOWN MALFUNCTION (SSM) EXEMPTIONS

Each facility is operating in compliance with applicable SSM exemptions.[36]

[31] DR 34 – MATS Compliance

[32] DR 35 – CSAPR Compliance

[33] DR 36 – Greenhouse Gas Regulations

[34] DR 37 – National Ambient Air Quality Standard

[35] DR 38 - National Ambient Air Quality Standard for PM 2.5

[36] DR 39 – Start-up, Shutdown Malfunction Exemptions

USEPA COAL COMBUSTION RESIDUAL (CCR) REGULATIONS

Each facility continues to meet all the applicable monitoring and reporting requirements under the current CCR regulations.[37]

USEPA EFFLUENT LIMITATION GUIDELINES (ELG)

Each facility is continuing to evaluate ELG requirements and they have draft compliance strategies in place designed to meet applicable compliance deadlines for each applicable wastewater discharge, including FGD water discharge, boiler bottom ash and fly ash. In September 2017, EPA issued a final ELG Postponement Rule, which includes a two year delay in the initial compliance window for FGD wastewater discharges and bottom ash transport wastewater, while the EPA reconsiders what constitutes "best available technology" for these waste streams. OVEC anticipates finalizing their ELG compliance strategy after the EPA completes this rulemaking.[38]

USEPA CLEAN WATER ACT SECTION 316(B)

Each facility is addressing 316(b) compliance by way of an EPRI collaboration project involving several Ohio River plants. Two years of entrainment sampling required by the rule was completed at both plants in 2015 and 2016. EPRI prepared required technical evaluations for each plant which, in turn, were submitted to the state regulatory authorities in November of 2018 (Kyger Creek) and January 2019 (Clifty Creek). These evaluations are subject to state agency review and feedback prior to taking next steps.[39]

II-F2 **During the audit period the Clifty Creek and Kyger Creek facilities were operated in full compliance with applicable Federal and State air emissions environmental regulations.**

During the audit period, each facility was operated in compliance with the applicable requirements for PM, SO_2, and NOx emissions under the state implementation plans, and complied with the NOx annual and ozone season allowance surrender requirements and the annual SO_2 allowance surrender requirements under the Cross State Air Pollution Rule (CSAPR). In addition, during the audit period each facility was operated in full compliance with the federal Mercury and Air Toxics Standard (MATS).[40]

Vantage, through Data Request 49 requests that DPL:

- Provide legal SO2, NOx, and Hg emission limits for all of the Companies' generating units.

[37] DR 40 – USEPA Coal Combustion Residual Regulations

[38] DR 41- USEPA Effluent Limitation Guidelines

[39] DR 42 – USEPA Clean Water Act Section 316(b)

[40] DR 64 – See Attachment 64-4 – Minutes from the Operating Committee Meeting

- Provide actual and planned SO2, NOx, and Hg emissions for the Audit Period.
- Provide a comparison of the actual SO2, NOx, and Hg quantities emitted from each unit with the monthly SO2 limits for each unit.
- Provide separately the average emission rate for SO2 (#/MMBtu), Hg, and NOx (#/MMBtu) for each unit for the same period.

DPL Response:[41]

"Emissions at the generating units are measured in a common stack attached to the FGD scrubbers, which serve multiple units. There are two common stacks at each generating station. The table below provides the most stringent applicable emission limits for SO2, NOx and Hg at each common stack in pounds per million Btu or trillion Btu, as applicable. Different averaging periods apply as shown in the table. For the audit period, actual emissions are provided as 30-day, 90-day, or annual average pounds per million or trillion Btu, depending on the averaging period associated with each emission rate limit or standard."

[41] DR 49

Exhibit VI-1 Confidential
Plant Emissions

PENDING ENVIRONMENTAL REGULATIONS

OVEC continues to monitor and evaluate the various ongoing regulatory activities as related to the EPA Effluent Limitation Guidelines and the facility cooling water 316(b) regulations. The Federal EPA and State environmental organizations continue with the development of the associated rules. During this period OVEC continues to develop various engineering studies with the intent to meet the pending environmental regulations.[42]

VI-F3 **OVEC is currently investigating various strategies to comply with the pending EPA Effluent Limitation Guidelines (ELG) and the Clean Water Act Section 316(b) regulations.**

EPA EFFLUENT LIMITATION GUIDELINES (ELG)

On September 30, 2015, the U.S. EPA signed a new final rule governing Effluent Limitations Guidelines (ELGs) for the wastewater discharges from steam electric power generating plants. The rule, which was formally published in the Federal Register on November 3, 2015, was going to impact future wastewater discharges from both the Kyger Creek and Clifty Creek Stations.

The rule was intended to require the Companies to modify the way a number of wastewater processes at both power plants are handled. Specifically, the new ELG standards were going to affect the following wastewater processes in three ways listed below; however, in April of 2017, EPA issued an administrative stay on the ELG rule, and then in June of 2017, the EPA issued a separate rulemaking staying the compliance deadlines for portions of the ELG rule applicable to bottom ash sluice water and to FGD wastewater discharges. EPA intends to reevaluate what constitutes "best available technology" for these two wastewater discharges and issue an updated rule by no later than the fall of 2020. OVEC along with the Sponsoring Companies continues to evaluate options to comply.

EPA Clean Water Act Section 316(b)

The 316(b) rule of the Clean Water Act was published as a final rule in the Federal Register on August 15, 2014, and impacts facilities that use cooling water intake structures designed to withdraw at least two million gallons per day from waters of the U.S. and who also have an National Pollution Discharge Elimination System (NPDES) permit. The rule requires such facilities to choose one of seven options specified by the rule to reduce impingement to fish and other aquatic organisms. Additionally, facilities that withdraw 125 million gallons or more per day must conduct entrainment studies to assist state permitting authorities in determining what site-specific controls are required to reduce the number of aquatic organisms entrained by each respective cooling water system. Additional analysis is being performed in compliance with the rule, and comprehensive reports are being developed for submittal to each facility's respective state agency for review.

[42] DR-64 – See Attachment 64-4 – Minutes from the Operating Committee Meeting

Capital Cost Estimates for Pending Environmental Regulations

VI-F4 **Potential costs for environmental compliance could be extremely high and OVEC and the OVEC Operating Committee need to continue to monitor the projected implementation of the regulations and the impact on OVEC operations.**

The EPA continues to develop the final rules associated with the ELG and 316(b) regulations. Recognizing that there still remains a high level of uncertainty as associated with the details in the final rule, which will certainly impact the capital costs of compliance, careful monitoring by the Operating Committee is warranted.

VI-R1 **The OVEC Operating Committee needs to continue to monitor the projected implementation of the regulations and the impact on OVEC operations.**

As changes in environmental regulations ae developed and made public, OVEC should communicate the impact to both its owners and regulatory commissions on a timely manner.

VII. POWER PLANT PERFORMANCE

RFP REQUIREMENT

The auditor shall review and report on significant plant outages or other degradations observed in the operating availability, equivalent availability, or capacity factors of OVEC's generating plants and their impact on ratepayers, and either make a recommendation to the Commission that further review is needed or undertake its own review to determine the reasonableness of OVEC and/or DP&L's actions. In addition, the auditor shall conduct an on-site investigation of at least one of OVEC's generating stations and report the resultant findings, conclusions, and recommendations. Items to be covered during the station visitation include, but are not limited to, the following: fuel handling and quality control (i.e., weighing, sampling, scale calibrations, etc.), inventory surveying methodologies and results, performance monitoring (i.e., heat rate) and maintenance.

PLANT DETAILS

Kyger Creek Station has a rated dependable maximum dependable load capability of 935 mW and a minimum load capability of 400 mW. Clifty Creek Station has a maximum dependable load capability of 1,200 mW and a minimum of 480mW. The following maps and operating statistics are shown to provide perspective on each unit and how it operated in recent years. In particular, we are interested in changes in Heat Rate, Availability, Equivalent, Availability Factor, and Equivalent Forced Outage Rate.

OVERVIEW ANALYSIS

A brief analysis of power plant performance is included here, as a means of testing whether the capital additions, replacements and ongoing maintenance and operating practices continue to be adequate.

Exhibit VII-1
Kyger Creek Station Aerial Photo

Exhibit VII-2
Clifty Creek Station Aerial Photo

VII-F1 **Power Plant operating have been consistent over the last five years.**

An examination of key operating factors provides the following.

Exhibit VII-3
Rated Maximum Load Capability (net)

	2015	2016	2017	2018	2019
Kyger Creek	995	995	995	995	995
Clifty Creek	1200	1200	1200	1200	1200

Exhibit VII-4
Heat Rate (net)

	2015	2016	2017	2018	2019
Kyger Creek	10,557	10,815	10,501	10,412	10,636
Clifty Creek	10,769	10,992	10,741	10,657	10,788

Exhibit VII-5
Equivalent Availability Factor

	2015	2016	2017	2018	2019
Kyger Creek	57.17	73.17	74.29	77.57	76.85
Clifty Creek	72.90	74.84	78.73	75.83	79.34

Exhibit VII-6
Equivalent Forced Outage Rate

	2015	2016	2017	2018	2019
Kyger Creek	26.09	9.34	5.72	5.27	3.11
Clifty Creek	13.46	7.51	7.06	7.94	7.84

Exhibit VII-7
Capacity Factor

	2015	2016	2017	2018	2019
Kyger Creek	42.23	56.46	67.71	66.56	63.28
Clifty Creek	49.65	47.55	57.44	60.37	54.44

Exhibit VII-8
Fuel Cost History[43] for the OVEC Plants

		2015	2016	2017	2018	2019
Kyger	Tons	1538908	2125411	2443317	2444453	2415692
	$/mmbtu	1.98	1.90	1.84	1.80	1.87
		2015	2016	2017	2018	2019
Clifty	Tons	2543861	2470274	2780768	3009042	2702842
	$/mmbtu	2.46	2.34	2.22	2.03	2.18

Exhibit VII-9
Variable Production Costs

($000)	2015	2016	2017	2018	2019
Kyger Creek	$ 24.870	$ 24.146	$ 22.102	$ 21.647	$23.157
Clifty Creek	$ 29.707	$ 28.466	$ 26.175	$ 23.920	$25.708

POWER PLANT OVERVIEW ANALYSIS

A brief analysis of power plant performance is included here, as a means of testing whether the capital additions, replacements and ongoing maintenance and operating practices continue to be adequate.

VII-F1 **Power Plant operations have been consistent over the last five years.**

An examination of key operating factors provides the following.

- There have been no changes in Maximum Load Capability over the last five years. This is an important factor because decreases could be a sign of system and equipment degradation that requires degrades.
- Heat rate has been consistent for both plants over the l five years. Kyger Creek varied from 10,412 BTU/kWh and Clifty Creek varied from 10,657 to 10,992 btu/kWh.
- The Equivalent Availability Factor has improved a bit for Kyger Creek over the last two years and Clifty Creek had its highest availability in 2019.
- Kyger Creek's Capacity Factor has been over 60% the last three years. Clifty Creek has been 6% to 8% lower than Kyger Creek and varied from 48 to 60%.

[43] VEC25-1

- Kyger Creek Forced Outage Rate has trended down over the last five years. Clifty Creek has been in the 7% range for four years.
- Capacity factors have improved for both plants over the last five years.
- Fuel costs for Kyger Creek have trended down slightly, $.12 from 2015 to 2019.
- Fuel costs for Clifty Creek have seen significant cost reductions over the last five years.
- Variable production costs have been consistent over five years.

VIII. PJM ACTIVITIES AND OPERATNG IMPACT

PJM Interconnection LLC (PJM) is a regional transmission organization (RTO) in the United States. It is part of the Eastern Interconnection grid operating an electric transmission system serving all or parts of Delaware, Illinois, Indiana, Kentucky, Maryland, Michigan, New Jersey, North Carolina, Ohio, Pennsylvania, Tennessee, Virginia, West Virginia, and the District of Columbia.

PJM is headquartered in Valley Forge, Pennsylvania and has more than 1,000 companies as members. PJM, serves 65 million customers and has 180 gigawatts of generating capacity. With 1,376 generation sources, 84,236 miles (135,560 km) of transmission lines and 6,038 transmission substations, PJM delivered 807 terawatt-hours of electricity in 2018.[2]

Started in 1927, the pool was renamed the *Pennsylvania-New Jersey-Maryland* Interconnection (PJM) in 1956. The organization continues to integrate additional utility transmission systems into its operations.

As part of compliance requirement with NERC Standard FAC-001-3, Requirements for the Connection of Facilities to The Dayton Power & Light Co. Transmission System, a January 2019 The DP&L's Facilities Connection Requirements document was prepared to ensure compliance with North American Electric Reliability Council (NERC) Reliability Standards and applicable Regional Reliability Organization, subregional, Power Pool, and individual Transmission Owner planning criteria and facility connection requirements in compliance to NERC Standard FAC-001-3. The purpose of NERC Standard FAC-001-3 is to require Transmission Owners and Generator Owners to establish facility connection and performance requirements to avoid adverse impacts on reliability for additions to the transmission system. These connection requirements apply to all generation facilities, transmission facilities, and end-users connecting to the DP&L transmission system. Further, DP&L is registered as a Transmission Owner with NERC. PJM serves as the Transmission Service Provider, Planning Authority, Transmission Planner, Resource Planner, Reliability Coordinator, and Transmission Operator for DP&L. PJM operates its transmission system in compliance with NERC Reliability Standards, ReliabilityFirst Corporation (RF) standards, and PJM standards. Since PJM is the Transmission Service Provider for the DP&L transmission system, all entities requesting interconnection of a generating facility (including increases to the capacity of an existing generating unit or decommissioning of a generating unit) or requesting interconnection of a merchant transmission facility within the DP&L transmission system must do so within PJM's defined interconnection process.

Exhibit VIII-1 PJM Settlement Form

CUSTOMER ACCOUNT: Dayton Power & Light Company

CUSTOMER IDENTIFIERS: DAYTON (259)

FINAL BILLING STATEMENT ISSUED: 02/07/2019 09:29:06

BILLING PERIOD: 01/01/2019 to 01/31/2019

CHARGES	BILLING LINE ITEM NAME	AMOUNT
1100	Network Integration Transmission Service	$0.00
1130	Firm Point-to-Point Transmission Service	$0.00
1140	Non-Firm Point-to-Point Transmission Service	$0.00
1200	Day-ahead Spot Market Energy	$(2,036,047.56)
1205	Balancing Spot Market Energy	$26,412.95
1210	Day-ahead Transmission Congestion	$111,573.20
1215	Balancing Transmission Congestion	$(1,199.12)
1220	Day-ahead Transmission Losses	$135,106.68
1225	Balancing Transmission Losses	$(1,036.43)
1301	PJM Scheduling, System Control and Dispatch Service - Control Area Administration	$0.00
1302	PJM Scheduling, System Control and Dispatch Service - FTR Administration	$0.00
1303	PJM Scheduling, System Control and Dispatch Service - Market Support	$0.00
1304	PJM Scheduling, System Control and Dispatch Service - Regulation Market Administration	$0.00
1305	PJM Scheduling, System Control and Dispatch Service - Capacity Resource/Obligation Mgmt.	$0.00
1320	Transmission Owner Scheduling, System Control and Dispatch Service	$0.00
1330	Reactive Supply and Voltage Control from Generation and Other Sources Service	$0.00
1340	Regulation and Frequency Response Service	$0.00
1360	Synchronized Reserve	$0.00
1365	Day-ahead Scheduling Reserve	$0.00
1370	Day-ahead Operating Reserve	$0.00
1375	Balancing Operating Reserve	$368.82

1376	Balancing Operating Reserve for Load Response	$(0.03)
1380	Black Start Service	$0.00
1375	Balancing Operating Reserve	$(1.17)
1375	Balancing Operating Reserve	$0.83
1375	Balancing Operating Reserve	$18.02
1375	Balancing Operating Reserve	$(8.02)
1999	PJM Customer Payment Default	$2,369.43
	Total Charges	**($1,762,442.40)**

VIII-F1 **OVEC provides energy into the PJM market through Sponsors who participate in the PJM Market.**

OVEC has a Delegation of Authority[44] in place with the Sponsors who are participants in the PJM market and offer the energy into the market on their behalf. OVEC does not bid Capacity into the capacity markets, as the Sponsors establish their own positions in the Capacity markets. OVEC does not presently participate in the Ancillary Services market, other than the Spinning Reserve market. OVEC is in the process of reviewing the associated costs and benefits of participation in the Ancillary Services markets.

[44] VEC DR 19

IX. DATA REQUESTS

DR #	Task	Request Description	Issued Date	Recd. Date	*CO Ref.#*
1	Task 1	Provide reporting requirements for Reconciliation Rider ("RR").	4/20/2020	6/16/2020	1
2	Task 1	Testimony, exhibits, orders, depositions and related materials associated with the disposition of energy and capacity regarding the company's RR.	4/20/2020	6/16/2020	2
3	Task 1	List any PJM documents related to compliance with Capacity Performance product. If any of the listed documents are not publicly available on the PJM website, provide a copy.	4/20/2020	6/3/2020	3
4	Task 1	Provide a copy of the OVEC Inter-Company Power Agreement including all amendments through December 31, 2019.	4/20/2020	6/5/2020	4
5	Task 1	Provide the calculations of the RR for each month of the audit period of November 1, 2018 through December 31, 2019. Include all workpapers for the RR calculations.	4/20/2020	6/16/2020	5
6	Task 1	Provide an organization chart for OVEC.	4/20/2020	6/4/2020	6
7	Task 1	DP&L Organization Chart for Market Operations.	4/20/2020	6/5/2020	7
8	Task 1	Provide PJM monthly invoices.	4/20/2020	6/3/2020	8
9	Task 1	Provide written procedures for the daily process undertaken by OVEC to communicate with both Clifty Creek and Kyger Creek Power Plants and the Sponsoring Companies to evaluate generating	4/20/2020	6/4/2020	9

		capability and enter generation offers into PJM.			
10	Task 1	Provide all documents related to the methodology and evaluation by DP&L to determine volumes and prices to bid into PJM's Base Residual Auction for Clifty Creek and Kyger Creek Power Plants for the 2017/2018 planning year.	4/20/2020	7/20/2020	10
11	Task 1	Provide calculations and documentation supporting the revenues received from PJM recorded in accounts and passed through the RR.	4/20/2020	6/16/2020	11
12	Task 1	Monthly summary reports filed with the Ohio PUC during the audit period.	4/20/2020	6/19/2020	12
13	Task 1	Procedures for allocation of costs/credits to ratepayers.	4/20/2020	6/16/2020	13
14	Task 1	Identify all departments involved in the process to calculate the RR. Provide organization charts for each of those departments.	4/20/2020	6/17/2020	14
15	Task 1	Any internal audits conducted on matters related to the RR.	4/20/2020	6/16/2020	15
16	Task 1	Provide copies of all procedures related to the calculation of the RR.	4/20/2020	7/7/2020	16
17	Task 1	Provide procedures or process map explaining the flow of costs/credits from each PJM account as well as DP&L's share of OVEC expenses to the RR.	4/20/2020	7/20/2020	17
18	Task 1	For the audit period, November 1, 2018 through December 31, 2019, provide all OVEC budget reports as well as all budget to actual reports available to OVEC senior	4/20/2020	6/5/2020	18

		management and Board members of OVEC.			
19	Task 2	Fuel cost history for the OVEC plants in tons of coal and $/mmbtu for the last 5 years.	4/20/2020	6/8/2020	25
20	Task 2	Previous forecasts of fuel prices	4/20/2020	6/8/2020	26
21	Task 2	Fuel supply and transportation contracts	4/20/2020	6/8/2020	27
22	Task 2	Fuel delivery schedules and performance results	4/20/2020	6/8/2020	28
23	Task 2	O&M cost history over last 5 years	4/20/2020	6/5/2020	29
24	Task 2	Procedures for fuel procurement and cost tracking	4/20/2020	7/13/2020	30
25	Task 2	Policies for fuel contracts	4/20/2020	6/16/2020	31
26	Task 2	Any internal audits conducted on fuel and operational related matters at the OVEC plants	4/20/2020	7/13/2020	32
27	Task 2	DP&L currently has a 4.9% share of the OVEC's power participation and requirements: a. How were the allocations for the Sponsoring Companies calculated? Please include a description of the methodology used, and provide all documentation supporting the calculation of the current allocation percentage for the Sponsoring Companies; b. How often is the allocation for Sponsoring Companies reviewed and updated?; c. Provide the allocation percentages for Sponsoring Companies from 2012 through current, including all supporting calculations and documentation.	4/20/2020	6/16/2020	33

28	Task 2	3. (a) Explain the basis of how employees' time is allocated to OVEC for services provided by its participants. For example, is time allocated based on time studies or other documented methods? (b) provide cost allocation manuals effective during the audit period describing procedures for allocating employees' time and other shared costs and resources between OVEC and its participants.	4/20/2020	6/16/2020	34
29	Task 2	Provide a general description of the process used to record revenues and costs passed through the RR rider.	4/20/2020	7/22/2020	35
30	Task 3	Copies of any procedures pertaining to the allocation and recording of OVEC capital expenses.	4/20/2020	6/17/2020	36
31	Task 3	An explanation of how DP&L determines if an OVEC capital expenditure is eligible for cost recovery through the RR.	4/20/2020	6/8/2020	37
32	Task 3	Listing of any OVEC capital expenditures that were determined to be ineligible for recovery through the RR. Include an explanation of why the Company determined the expenditure was ineligible for recovery.	4/20/2020	6/8/2020	38
33	Task 3	Listing of all OVEC capital expenditures during the last 2 years. Include a description of the expenditure, the total dollar amount and the Ohio Power allocation of the capital expenditure.	4/20/2020	6/8/2020	39
34	Task 4	For each of the generating facilities provide the status of the associated Unit's environmental compliance	4/20/2020	6/9/2020	40

		under the USEPA Mercury and Air Toxics Standard (MATS).			
35	Task 4	For each of the generating facilities provide the status of the associated Unit's environmental compliance under the USEPA Cross State Air Pollution Rule (CSAPR).	4/20/2020	6/7/2020	41
36	Task 4	For each of the generating facilities provide the status of the associated Unit's environmental compliance under the USEPA Greenhouse Gas Regulations (GHG).	4/20/2020	6/19/2020	42
37	Task 4	For each of the generating facilities provide the status of the associated Unit's environmental compliance under the USEPA National Ambient Air Quality Standard (NAAQS) for ozone.	4/20/2020	6/7/2020	43
38	Task 4	For each of the generating facilities provide the status of the associated Unit's environmental compliance under the USEPA National Ambient Air Quality Standard (NAAQS) for PM2.5.	4/20/2020	6/7/2020	44
39	Task 4	For each of the generating facilities provide the status of the associated Unit's environmental compliance under the USEPA Start-up, Shutdown Malfunction (SSM) Exemptions.	4/20/2020	6/8/2020	45
40	Task 4	For each of the generating facilities provide the status of the associated Unit's environmental compliance under the USEPA Coal Combustion Residual (CCR) Regulations.	4/20/2020	6/8/2020	46
41	Task 4	For each of the generating facilities provide the status of the associated Unit's environmental compliance	4/20/2020	6/9/2020	47

		under the USEPA Effluent Limitation Guidelines (ELG).			
42	Task 4	For each of the generating facilities provide the status of the associated Unit's environmental compliance under the USEPA Clean Water Act impacting Cooling Water Intakes under section 316b of the Clean Water Act.	4/20/2020	6/9/2020	48
43	Task 4	Please provide legal SO2, NOx, and Hg emission limits for all of the OVEC generating units. Provide actual and planned SO2, NOx, and Hg emissions for the Audit Period. Provide a comparison of the actual SO2, NOx, and Hg quantities emitted from each unit with the monthly SO2 limits for each unit. Provide separately the average emission rate for SO2 (#/MMBtu), Hg, and NOx (#/MMBtu) for each unit for the same period.	4/20/2020	6/19/2020	49
44	Task 5	For the past 5 years, please provide a performance profile for each of the OVEC generating facilities outlining the following: a) Please provide maps showing the Company service territory and its electric power generating stations. a) Equivalent availability factor b) Equivalent forced outage rate c) NERC GADS reports d) List of the top 10 major availability detractors e) Capacity factor f) Heat rate g) Variable production costs $/MWH h) Rated maximum load capability i) Rated dependable minimum load capability	4/20/2020	6/5/2020	50

45	Task 5	For the past 5 years, please provide a summary of any major forced outages at each OVEC generating facility and provide the associated root cause analysis for each.	4/20/2020	6/8/2020	51
46	Task 5	For each OVEC generating facility please provide a description of the maintenance management system.	4/20/2020	6/8/2020	52
47	Task 5	For each OVEC generating facility provide the description of the facility performance monitoring process.	4/20/2020	6/8/2020	53
48	Task 5	Provide an organization chart of the performance monitoring team including each facility's and corporate organizations.	4/20/2020	7/7/2020	54
49	Task 6	Identify 5 key members of the Ohio Power management team for potential interviews relative to the current dynamics of the industry in which Ohio Power operates, the impact of those dynamics on the Company's practices regarding fuel procurement, fuel utilization, power purchases and capacity purchases.	4/20/2020	verbal responses	
50		For the past 5 years, please provide a performance profile for each of the OVEC generating facilities outlining the following: a) Please provide maps showing the Company service territory and its electric power generating stations. a) Equivalent availability factor b) Equivalent forced outage rate c) NERC GADS reports d) List of the top 10 major availability detractors e) Capacity factor f) Heat rate g) Variable production costs $/MWH h) Rated maximum load capability	4/20/2020	6/5/2020	50

		i) Rated dependable minimum load capability			
51	Task 6	Identify 5 key members of the Ohio Power management team for potential interviews to discuss the need for new environmental controls; the changing coal markets; transmission constraints; as well as other tactical and strategic impacts to operations.	4/20/2020	verbal responses	
52	Task 1	Confirm whether OVEC is bidding or participating in any other market that may provide revenue above and beyond that which is received in energy and capacity markets, including, but not limited to, PJM-administered ancillary services markets.	4/20/2020	6/5/2020	19
53	Task 4	For the past 5 years, please provide a summary of any major forced outages at each OVEC generating facility and provide the associated root cause analysis for each	4/20/2020	6/8/2020	51
54	Task 1	Confirm whether OVEC is offering the plants into PJM as "must-run".	4/20/2020	7/7/2020	20
55	Task 4	For each OVEC generating facility please provide a description of the maintenance management system.	4/20/2020	6/8/2020	52
56	Task 1	Provide PJM Base Residual Auction bidding history for last five years	4/20/2020	7/13/2020	21

57	Task 4	For each OVEC generating facility provide the description of the facility performance monitoring process.	4/20/2020	6/8/2020	53
58	Task 1	Provide PJM Base Residual Auction clearing results for last five years	4/20/2020	7/13/2020	22
59	Task 1	Provide the names of each PJM subaccount used by DPL, describe what the subaccount is used for, and indicate what charges and credits would be expected to appear in each account.	4/20/2020	6/5/2020	23
60	Task 1	Provide procedures for shadowing or reviewing PJM bills for accuracy, either by internal or external parties.	4/20/2020	6/5/2020	24
61		Refer to the response to VEC-33. For the capital expenditures listed below, provide documentation justifying the need for the capital asset addition, the cost estimate, analysis of budget to actual for the expenditure and the depreciation schedule. Sample #1 - Plan Year 2018 - Kyger Creek - Unit #5 Bafflewall Replacement - Actual Capital Cost $2,630,269. DPL Cost - $128,883; Sample #2 - Plan Year 2018 - Clifty Creek - 2 Air Blast Circuit Breakers- Actual Total Cost $664,795 - DPL Cost - $32,575; Sample #3 - Plan Year 2019 - Kyger Creek - Ovation Controls (2 of 2) - Actual Capital Cost - $3,420,791 - DPL Cost $167,619; Sample 4 - Plan Year 2019 - Clifty Creek - Station #1 Barge Unloader Rebuild - Actual Capital Cost - $1,861,276 - DPL Cost - $91,203	6/30/2020	8/17/2020	61
62	Task 4	With regard to any environmental-related issues, did OVEC receive any fines, penalties or notices of violation from any state or federal environmental agency during the	8/24/2020	8/31/2020	62

		audit period of November 1, 2018 through December 31, 2019.			
63	Task 3	Please provide an explanation of the flow of documents and process flow related to capital expenses, i.e., frequency of invoices, how they are approved, how and when they are recorded in the general ledger. Data Request #30 states, OVEC's capital expenses are converted into an annualized amount that is charged to DP&L based on its 4.9% ownership share. Please provide further explanation of "converted into an annualized amount". Are different depreciation schedules used?	8/24/2020	8/31/2020	63
64	Task 3	Please provide the names of all OVEC Committees and sub committees. What is their purpose, how often do they meet, who are the members? Provide copies of any reports and minutes produced during the audit period.	8/24/2020	9/1/2020	64

X. INTERVIEWS

Interviews included:

- Patrick Donlon, Director Regulatory Accounting
- Natalie Coklow, Manager, Regulatory Accounting
- Chad Reithmiller, Manager, Revenue Accounting
- Sharon Schroder, Managing Director. Regulatory Operations
- Nathan Parke, Senior Manager, Regulatory Operations
- Jennifer Kendo, Manager, Settlements
- Mark Miller, COO DP&L
- David Crusey, Director Risk Management

The major topics addressed included:

1. DISPOSITION OF ENERGY AND CAPACITY
2. FUEL AND VARIABLE COST EXPENSES
3. CAPITAL EXPENSES
4. ENVIRONMENTAL COMPLIANCE
5. POWER PLANT PERFORMANCE
6. UTILITY INDUSTRY PERSPECTIVE