***OCC EXHIBIT\_\_\_\_\_\_\_***

**BEFORE**

**THE PUBLIC UTILITIES COMMISSION OF OHIO**

|  |  |  |
| --- | --- | --- |
| In the Matter of the Application of VEDO Energy Delivery of Ohio, Inc. for Approval of an Alternative Rate Plan. | ))) | Case No. 18-0049-GA-ALT |
| In the Matter of the Application of VEDO Energy Delivery of Ohio, Inc. for Approval of an Increase in Gas Rates. | ))) | Case No. 18-0298-GA-AIR |
| In the Matter of the Application of VEDO Energy Delivery of Ohio, Inc. for Approval of an Alternative Rate Plan. | ))) | Case No. 18-0299-GA-ALT |

**DIRECT TESTIMONY**

**OF**

**MOHAMMAD HARUNUZZAMAN, Ph.D.**

**On Behalf of**

**The Office of the Ohio Consumers' Counsel**

*65 East State Street*

*Columbus, Ohio 43215-4213*

**November 7, 2018**

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ATTACHMENT

Attachment MH-1

# **I. INTRODUCTION**

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

***A1.*** My name is Mohammad Harunuzzaman. My business address is 65 East State Street, 7th Floor, Columbus, Ohio 43215. I am employed by the Office of the Ohio Consumers’ Counsel (“OCC”) as a Principal Regulatory Analyst.

***Q2. PLEASE BRIEFLY SUMMARIZE YOUR EDUCATION AND PROFESSIONAL EXPERIENCE.***

***A2.*** I earned a Doctorate in Nuclear Engineering from the Ohio State University in 1994. In the doctoral program, my fields of specialization were reliability and safety of nuclear power plants, and cost optimization. I also have a bachelor’s degree in Physics from the University of Dhaka, Bangladesh.

My professional experience includes nearly 15 years of regulatory policy research at the National Regulatory Research Institute (“NRRI’), The Ohio State University, more than seven years in electric market analysis at Pepco Energy Services (“PES”), an unregulated affiliate of Potomac Electric Power Company (“PEPCO”), and one year in electric fuel price forecasting at the Florida Power and Light Company (“FPL”).

At the NRRI, I performed regulatory policy analysis, supported by engineering and quantitative analysis, of issues that include cost-of-service and rate design, deregulation of the natural gas industry and retail gas choice programs, separation of costs and services of regulated and unregulated parts of a utility company (to prevent cross subsidization of the unregulated affiliate by the regulated utility), incentive regulation as applied to energy efficiency and gas acquisition practices of a local distribution company, and to renewables and advanced generation technologies of an electric utility.

At FPL, I worked on the forecasting of energy fuel prices including coal, gas, and oil. At PES, I performed computer modeling simulation and analysis of wholesale regional electricity markets, including the PJM,[[1]](#footnote-2) NYISO,[[2]](#footnote-3) NEISO[[3]](#footnote-4) and ERCOT,[[4]](#footnote-5) and forecasted electricity prices. At the same company, I also performed analysis to support financial risk management operations of the company.

Since March 2016, I have been employed as Principal Regulatory Analyst at the OCC. At my current position, I am responsible for research, investigation, and analysis of regulatory filings, participation in special projects, and assisting in policy development and implementation. Also, I have been the assigned leader of the OCC industry group for gas and have the responsibility for coordinating analytical work for gas cases.

A list of my professional publications is included in Attachment MH-1.

***Q3. HAVE YOU PREVIOUSLY SUBMITTED TESTIMONY OR TESTIFIED BEFORE THE PUBLIC UTILITIES COMMISSION OF OHIO?***

***A3*.** Yes, I testified on behalf of OCC in the Columbia IRP Case 16-2422-GA-ALT.

# II. PURPOSE OF MY TESTIMONY

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

***A4***.The purpose of my testimony is to explain and support OCC’s objections 1, 18,19, 20, 21, 22, and 23 to the Staff Report in the Vectren Energy Delivery of Ohio, Inc (“VEDO”) Rate Case (18-0298-GA-AIR) regarding the Capital Expenditure Program (“CEP”) Rider and Distribution Replacement Rider (“DRR”).

# III. OVERVIEW THE CAPITAL EXPENDITURE PROGRAM THAT VEDO’S CUSTOMERS PAY FOR

***Q5. PLEASE PROVIDE AN OVERVIEW OF THE CAPTIAL EXPENDITURE PROGREM (“CEP”).***

***A5.*** House Bill 95 (“HB95”) and Ohio Revised Code 4929.111 allow a natural gas company to implement a CEP for any of the following:

(1)  Any infrastructure expansion, infrastructure improvement, or infrastructure replacement program;

(2) Any program to install, upgrade, or replace information technology systems;

(3)  Any program reasonably necessary to comply with any rules, regulations, or orders of the commission or other governmental entity having jurisdiction.

ORC 4929.111 also directs the PUCO to authorize a natural gas company to defer or recover both of the following.

(1)  A regulatory asset for the post-in-service carrying costs on that portion of the assets of the capital expenditure program that are placed in service but not reflected in rates as plant in service;

(2)  A regulatory asset for the incremental depreciation directly attributable to the capital expenditure program and the property tax expense directly attributable to the capital expenditure program.

Therefore, deferred expenses of a CEP can be treated as a regulatory asset that can earn a return on and of this asset.

The CEP was established for VEDO by PUCO order in Case No. 12-530-GA-UNC (“12-530 Order”). In the Order, the Commission approved accounting authority, inclusive of the deferral of depreciation and property tax expense and the accrual of post-in-service carrying cost (“PISCC”), on investments made under the Utility’s CEP for the period October 1, 2011 through December 31, 2012. In a subsequent case, Case No. 13-1890-GA-UNC (“13-1890 Order”), the PUCO approved the continuation of the CEP investments and deferral beyond December 31, 2012, up to the point when the deferral would reach the $1.50 per customer per month cap established in the 12-530 Order.

In the current Application, VEDO seeks to collect from customers in base rates the regulatory assets approved for deferral in 12-530 and 13-1890 Orders. Between 2011 and 2017, the total deferral was $66 million.[[5]](#footnote-6) The underlying CEP investments will also be collected in the current rate case. VEDO proposes to collect its CEP deferrals beginning January 1, 2018 through December 31, 2023 in annual CEP riders. The rider will collect deferred depreciation, property tax, and PISCC and the underlying assets will be excluded from the rider but will be included in rate base and collected from customers as a result of the next base rate case.[[6]](#footnote-7)

# IV. OVERVIEW OF THE DISTRIBUTION REPLACEMENT RIDER THAT VEDOVEDO cUSTOMERS PAY FOR

***Q6. PLEASE PROVIDE AN OVERVIEW OF THE DISTRIBUTION REPLACEMENT RIDER (“DRR”).***

***A6.*** VEDO has a program for accelerated replacement of high-risk distribution bare steel and cast iron (“BSCI”) mains and associated service lines, called the Replacement Program. This program also includes other high-risk assets such as field coated steel, vintage plastic, and obsolete equipment associated with the BSCI mains. The Replacement Program also includes relocation of meters outside of customer premises and the replacement of customer-owned services.[[7]](#footnote-8)

The DRR was established in Case No. 07-1080-GA-AIR to collect from consumers Replacement Program costs. The DRR was initially in effect for five years and was extended for another five years to 2017 in Case No. 13-1571-GA-ALT (the “Extension Case”). In VEDO’s current application, it asks to extend the Replacement Program to 2023 and seeks to collect associated costs in the DRR. [[8]](#footnote-9)

# V. COMMENTS ON THE STAFF REPORT AND OCC RECOMMENDATIONS

***Q7. WHAT WAS STAFF’S RECOMMENDATION ON THE REVIEW OF VEDO’S CEP? (Objections 1, 18, and 19)***

***A7.*** VEDO proposed an annual Staff review of its CEP rider application to be filed on April 1 of every year beginning in 2019. The review will involve an investigation, over a two-month period, of VEDO’s CEP investments and deferrals over the prior calendar year. Staff also recommends a minimum of four months, instead of the two months proposed by VEDO, between when the Utility files its application and Staff issues its investigative report.[[9]](#footnote-10) Besides the annual audit, Staff also recommended a separate used and useful, necessity, and prudence audit of CEP assets placed in service between the current rate case (i.e. beginning in 2018) and the next rate case.

***Q8. DO YOU SUPPORT STAFF’S RECOMMENDATIONS ABOVE?***

***A8.*** Yes, I do.

***Q9. DO YOU HAVE ANY ADDITIONAL RECOMMENDATIONS TO PROTECT RESIDENTIAL CUSTOMERS? (Objection 18)***

***A9.*** Yes. I would add that a minimum of one month be allowed after the annual Staff audit for OCC and other parties to review the audit and file comments. Further, I recommend that the used and useful, necessity and prudence audit proposed by Staff should be performed by an independent third-party, consistent with the practices generally followed in PUCO-ordered audits.

***Q10. DO YOU HAVE ANY OTHER RECOMMENDATIONS TO PROTECT RESIDENTIAL CUSTOMERS? (Objection 18)***

***A10.*** Yes, I do. I recommend that there should be special emphasis on the “necessity” part of the audit.

***Q11. CAN YOU ELABORATE? (Objection 18)***

***A11.*** Yes. I consider the necessity part of an audit the most important. The necessity part of the audit should scrutinize whether the CEP investments and underlying assets were needed for purposes of serving customers, maintaining the reliability and safety of the system, and to meet other service obligations of a gas distribution utility. Further, the necessity audit should determine whether the *level* of investments was commensurate with the service obligations of VEDO.

For example, a gas utility needs to forecast the level of mains capacity that would be needed to meet peak demand of all customers. Then, the utility needs to determine the least cost way to build that capacity, and other associated support facilities and services. The utility can use these metrics, as well as other data, as inputs to its capital budget forecasting, planning and implementation process. An audit can track the process outlined above to evaluate the necessity of capital expenditures.

***Q12. DID THE PUCO STAFF RECOMMEND A USED AND USEFUL, PRUDENCE AND NECESSITY AUDIT FOR VEDO’S CEP INVESTMENTS BETWEEN 2011-2017? (Objection 19)***

***A12.*** No, it did not. However, the PUCO Staff performed an audit of VEDO’s expenses between 2011 and 2017. The Staff audit consisted of an investigation of test year operating income and date certain rate base and included a review of VEDO’s budgeting and forecasting techniques, verification of the operating revenue computation, and an examination of VEDO’s continuing property records. In addition, Staff verified the existence and used and useful nature of the assets through physical inspections. Staff performed other independent analyses it considered necessary.

***Q13. DO YOU RECOMMEND A USED AND USEFUL, PRUDENCE AND NECESSITY AUDIT FOR VEDO FOR THE ABOVE PERIOD TO PROTECT RESIDENTIAL CUSTOMERS?***

***A13.*** Yes, I do.

***Q14. WHAT ARE YOUR REASONS FOR RECOMMENDING THIS AUDIT?***

***A14.*** VEDO is seeking to recover the CEP investments during 2011-2017 and associated deferrals from customers in the current rate case. For these charges to consumers to be considered just and reasonable, the underlying investments need to be used and useful, prudent and necessary.

***Q15. HAS VEDO CLAIMED THAT ITS REQUESTED CEP RIDER RATES ARE JUST AND REASONABLE?***

***A15.*** Yes, it has. However, that claim should be verified through an independent review.[[10]](#footnote-11)

***Q16. DO YOU HAVE THE SAME RECOMMENDATIONS FOR THE PROPOSED AUDIT OF 2011-2017 INVESTMENTS AS THE AUDIT OF POST 2017 INVESTMENTS?***

***A16.*** Yes, I do. I believe this audit also should have an emphasis on necessity.

***Q17. ONE EFFECTIVE WAY TO INSTITUTE COST CONTROLS, FOR THE PROTECTION OF CUSTOMERS, IS TO SET SPENDING REVENUE AND RATE CAPS. DOES STAFF RECOMMEND SUCH CAPS FOR VEDO’S CEP? (Objection 20)***

***A17.*** Yes, it does. Staff asks VEDO to work with it to develop meaningful spending, revenue and rate caps.

***Q18. WHAT IS YOUR UNDERSTANDING OF THE WORD “MEANINGFUL” IN THE CONTEXT OF CAPPING THE UTILITY RATES THAT CUSTOMERS PAY?***

***A18.*** My understanding of “meaningful” is that the caps are effective in controlling customer charges. In other words, the caps provide reasonable upper limits to costs that a utility can achieve if it is prudent in choosing investments and efficient in minimizing costs. In contrast, a “meaningless” cap (i.e. a relatively high cap) would be that which allows more latitude to the utility and does not constraint its costs effectively so that the utility can still comply with the cap without being prudent or efficient.

***Q19. DO YOU HAVE ANY RECOMMENDATIONS ON STAFF’S SPENDING, REVENUE, AND RATE CAP PROPOSAL THAT WOULD PROTECT CUSTOMERS?***

***A19.*** Yes, I do. I recommend that VEDO be asked to work with OCC, in addition to Staff, to develop caps. As the advocate for residential consumers of Ohio, OCC has a significant stake in ensuring just and reasonable rates for residential consumers. Caps on spending, revenues, and rates are an effective way to limit consumer charges to more reasonable levels, and OCC needs to be a part of any collaborative process to establish caps and corresponding charges to customers.

***Q20. DO YOU HAVE ANY RECOMMENDATION ON METHODOLOGIES TO DEVELOP CAPS THAT WOULD PROTECT CUSTOMERS?***

 ***A20.*** Yes, I do. I recommend developing caps using parameters external to the utility in combination with the utility’s own estimates of demand and costs. Such parameters could include the GDP growth rate, the inflation rate, and industry-wide cost escalation rates for labor, construction installation of plant and equipment. The GDP growth rate could be an indicator of the utility’s demand and sales growth, and industry-wide average cost escalation rates could be good indicators of how construction and labor costs are likely to increase for a utility. For use in developing caps, these exogenous parameters should be thoroughly researched and vetted.

***Q21. FOR THE PROTECTION OF CUSTOMERS, IS IT MORE APPROPRIATE TO USE THE UTILITY’S OWN FORECASTS RATHER THAN ANY NATIONAL OR INDUSTRY-WIDE INDEX FOR SETTING CAPS?***

***A21.*** A utility’s own forecast would be a good input in the cap development process. However, an exclusive reliance on the utility’s own forecasts can bias the results in favor of higher rather than lower costs, to the detriment of consumers.

***Q22. SO, DO YOU THINK CAPS BASED ON A UTILITY’S OWN ESTIMATES AND FORECASTS OF DEMAND AND COSTS WILL BE HIGHER (AND REQUIRE CUSTOMERS TO PAY MORE) THAN WHAT WOULD REFLECT AN EFFICIENT LEVEL OF INVESTMENTS AND COSTS?***

***A22*.** Yes, and such caps can be so inordinately high as to render them “meaningless” in the sense that the caps are very unlikely to ever be reached.

***Q23. WOULD YOU THEN AGREE THAT CAPS BASED ON EXOGENOUS INDICES AND PARAMETERS PROMOTE EFFICIENT INVESTMENTS AND EXPENDITURES, TO CUSTOMERS’ BENEFIT?***

***A23.*** Yes, I agree.

***Q24. ARE YOU OPPOSED TO USING ANY UTILITY-SPECIFIC DATA IN DEVELOPING CAPS ON RATES CUSTOMERS PAY?***

***A24.*** Not at all. I would recommend using a reasonable combination of a utility’s own costs and cost estimates and indices external to the utility in developing caps. It is necessary to have significant input from a utility’s operations and expenses into the cap development process to realistically reflect the unique characteristics of a utility. The use of thoroughly researched and vetted parameters external to the utility is appropriate when they can act as efficient benchmarks against which the utility is asked to compete.

***Q25.*** ***What other CEP Issues, in addition to those related to CEP investments and cost controls, do you want to address in your testimony?***

***A25.*** I want to address the issues of (1) continual depreciation of retired plants and (2) incremental revenue offset of CEP deferrals.

***Q26.*** ***Does the Staff Report address the issue of the utility continuing to build depreciation charges for its plants and assets that have already been retired?* (*Objection 1*)**

***A26.*** Yes, it does. Staff recommends that VEDO create an offset so that tariffed rates being established in this rate case reflect the recovery of an amount of depreciation expense that will decline over time and therefore no longer include the rate base upon which that depreciation expense was established. Many of the assets that comprise the rate base as of the date certain of this case will be retired and therefore the associated depreciation expense should also be declining. As the depreciation expense of the plant additions are either being recovered through the CEP Rider rate or being deferred on a going forward basis for future recovery, there should be recognition that the depreciation expense embedded in current base rates will be recovering plant that is no longer in service.

***Q27.*** ***Do you agree with this recommendation?***

***A27.*** Yes, I do. However, the Staff Report does not indicate whether it investigated continual depreciation of retired plants by VEDO.

***Q28.* What do you recommend?**

***A28.*** I recommend that Staff investigate whether VEDO depreciated any plant after it has been retired. If Staff finds that VEDO depreciated any plant after it has been retired, customers’ charges should be reduced in an amount equal to the depreciation.

***Q29. DOES THE STAFF REPORT ADDRESS THE ISSUE OF INCREMENTAL REVENUE OFFSETS TO VEDO’S CEP DEFERRALS, THUS REDUCING THE RATES THAT VEDO’S CUSTOMERS PAY? (Objection 21)***

***A29*.** No, it does not.

***Q30. CAN YOU ELABORATE ON THE ISSUE?***

***A30.*** Yes. In its 12-530 Order, the PUCO opined that VEDO’s calculation of deferred regulatory assets (which include depreciation, property taxes, and associated carrying costs) should be net of incremental revenues. Incremental revenues are those that are earned above approved revenue requirements and are directly attributable to CEP investments. Offsetting the costs with the revenues received (above the revenue requirements) would benefit customers by reducing rates.

***Q31. IS THERE ANY OFFSET TO DEFERRED REGULATORY ASSETS IF THERE IS ZERO INCREMENTAL REVENUE?***

***A31*.** No. The way the CEP is currently set up, there is no offset if the incremental revenue generated by the CEP investments are zero.

***Q32. DO YOU RECOMMEND CHANGING THIS OFFSET MECHANISM TO PROTECT CUSTOMERS?***

***A32.*** Yes. I recommend that VEDO establishes a minimum guaranteed incremental revenue offset, which might be indexed to a combination of load growth forecasts, the level of planned CEP investment expected to generate incremental revenues, and other relevant factors each year.

***Q33. WHAT IS YOUR REASONING BEHIND RECOMMENDING SUCH A MECHANISM FOR CREDITING INCREMENTAL REVENUES?***

***A33.*** If we consider the reasons behind achieving incremental revenues, they are a combination of factors that include growth in the number of customers and increase in load or demand of existing customers. These incremental revenues would be generated by CEP investments in assets built to serve this incremental customer demand or growth. Therefore, the incremental demand is one of the primary causes of incremental revenues. It is also one of the rationales for the corresponding CEP investments. Accordingly, it would be reasonable to establish a minimum guaranteed incremental revenue offset to CEP deferrals.

***Q34. ARE THERE ANY CONSUMER PROTECTION BENEFITS TO YOUR RECOMMENDED OFFSET MECHANISM?***

***A34.*** Yes. Such a minimum guaranteed incremental revenue offset will constrain excessive investments and overly optimistic projections of growth. This proposed minimum offset will provide some protection for consumers from potential overcharges. Finally, this offset can penalize the utility for excessive investments.

***Q35. DID THE STAFF REPORT HAVE ANY OTHER RECOMMENDATION REGARDING THE CEP THAT YOU WOULD LIKE TO COMMENT ON? (Objection 22)***

***A35*.** Yes, it did. Staff recommended that the Utility initiate discussions with it regarding the potential creation of a single rider that would include all capital investments.[[11]](#footnote-12)

***Q36. WHAT WAS THE STAFF’S RATIONALE FOR THIS RECOMMENDATION?***

***A36*.** Staff contends that a single rider would streamline accounting, tracking, and auditing for the Utility and Staff.[[12]](#footnote-13)

***Q37. DO YOU SUPPORT THIS RECOMMENDATION?***

***A37*.** No, I do not.

***Q38. WHY NOT?***

***A38.*** It is not clear that a merger of these two riders would streamline the accounting and auditing of the two sets of investments and expenses. The two riders serve clearly different purposes. The CEP is for growth and improvement to meet the utility’s obligation to serve. The DRR, and the underlying Replacement Program, is for accelerated or proactive replacement of assets for promoting performance, reliability, and safety. Further, while there are commonalities between the two programs, there are also many differences. So, it is not obvious that any economies of scope in accounting will not be offset by the differences in the purposes of the two programs. For example, capital investments for necessary or ordinary infrastructure expansion/replacement will still have to be separated from capital investments for accelerated replacement, even if they belong in the same family of account numbers. Finally, merging the two might also lead to errors because of the overlap between the two programs, and such errors might be detrimental to consumers.

***Q39. DOES STAFF RECOMMEND AN END DATE FOR THE COMBINED RIDER?***

***A39.*** Yes, it does. Staff recommends that the rider would be filed annually and would conclude or sunset at the filing of the next rate case.[[13]](#footnote-14)

***Q40. DO YOU AGREE WITH THIS LAST RECOMMENDATION?***

***A40*.** Yes, I do.

***Q41. WHAT IS YOUR OVERALL RECOMMENDATION FOR THE PROTECTION OF CONSUMERS?***

***A41.*** I recommend that the two riders be kept separate and both be abolished at the filing of the next rate case.

***Q42. DID YOU WANT TO ADDRESS ANY ISSUE IN VEDO’S APPLICATION THAT THE STAFF REPORT DID NOT ADDRESS BUT IS IMPORTANT FOR CONSUMERS? (Objection 23)***

***A42.*** Yes, I do.

***Q43. CAN YOU DESCRIBE THE ISSUE?***

***A43*.** VEDO proposes caps on the monthly DRR charge for residential customers as shown below.[[14]](#footnote-15)

|  |  |
| --- | --- |
| **Annual Period** | **Residential Rate Cap**(per customer, per month) |
| September 1, 2019–August 31, 2020 | $2.50 |
| September 1, 2020–August 31, 2021 | $5.00 |
| September 1, 2021–August 31, 2022 | $7.50 |
| September 1, 2022–August 31, 2023 | $10.00 |
| September 1, 2023–August 31, 2024 | $12.00 |
| September 1, 2024–August 31, 2025 | $13.75 |

VEDO then proposes that “during any of the six years of the DRR as proposed in this proceeding, VEDO’s actual costs result in a DRR monthly charge to its Residential customers that exceed the caps described above, VEDO may defer on its books any costs that it is unable to include in the DRR because the applicable Residential customer cap would otherwise be exceeded.”[[15]](#footnote-16) VEDO also proposes to apply carrying charges to this deferred cost.[[16]](#footnote-17)

VEDO’s proposed exception to the rate caps essentially negates the caps. The purpose of a rate cap is to limit costs under the cap and, ultimately, charges to consumers. Allowing VEDO to charge residential customers above the cap, by deferring the excess (with carrying charges) for future collection from customers not only defeats the purpose of the cap, it also rewards VEDO for exceeding the cap.

***Q44. DID THE STAFF REPORT ADDRESS THIS ISSUE?***

***A44.*** No. The Staff Report agrees with the above rate caps through 2023 but does not discuss VEDO’s proposed exception.[[17]](#footnote-18)

***Q45. WHAT DO YOU RECOMMEND for the protection of customers?***

***A45*.** I recommend that, to protect residential customers from an unjust and unreasonable charges, VEDO’s proposal allowing it VEDO to defer any excess over the cap with carrying charges be denied.

# vI. Conclusions

***Q46. CAN YOU SUMMARIZE YOUR RECOMMENDATIONS?***

***A46.*** Yes. Below is a summary of my recommendations.

* For the protection of consumers, there should be a used and useful, necessity and prudence audit of CEP assets, to be performed by an independent auditor, between the current and the next rate case.
* There should be a used and useful, necessity and prudence audit of CEP investments between 2011 and 2017, to be performed by an independent auditor.
* VEDO should work with Staff and OCC to develop meaningful spending, revenue, and rate caps for CEP to limit increased charges to residential consumers.
* It should be investigated whether VEDO is continuing to depreciate plants and assets that have been retired.
* A minimum incremental operating revenue offset for the CEP deferred regulatory assets should be established.
* The CEP rider and the DRR should be abolished after the next rate case. All allowable CEP and DRR capital expenditures should be recovered in future rate cases.
* The PUCO Staff accepted DRR rate caps for the years 2018 – 2023 for residential customers proposed by VEDO. But Staff failed to address an exception in the VEDO proposal that essentially negates the rate caps.  OCC recommends that the exception be denied.

**Q47.DOES THIS CONCLUDE YOUR TESTIMONY?**

***A47.*** Yes. However, I reserve the right to incorporate new information that may subsequently become available through outstanding discovery or otherwise.

**CERTIFICATE OF SERVICE**

It is hereby certified that a true copy of the foregoing *Direct Testimony of Mohammad Harunuzzaman, Ph.D. on Behalf of the Office of the Ohio Consumers’ Counsel* was served via electronic transmission to the persons listed below this 7th day of November 2018.

 */s/ William J. Michael*

 William J. Michael

 Assistant Consumers’ Counsel

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ATTACHMENT MH-1

Mohammad Harunuzzaman, Ph.D. List of Professional Publications

**Papers on Nuclear Safety and Reliability**

*Nuclear Technology,* "Optimization of Standby Safety System Maintenance Schedules in Nuclear Power Plants," 113, 354-367 (March 1996) (with T. Aldemir).

*Transactions of the American Nuclear Society,* " Optimal Preventive Maintenance of a Nuclear Power Plant Subsystem Using Dynamic Programming," 57, 99-100 (November 1988) (with T. Aldemir).

*American Nuclear Society,* "Sensitivity of Optimal Maintenance Cost to Reliability Constraints, PSA '96: Probabilistic Safety Assessment," II, 1632-1635 (September 1996) (with T. Aldemir).

###### Reports and Publications on Public Utility Regulation

*The National Regu1atoryResearch Institute,* The State of Regulation, An Examination of the Four Utility Sectors, 2001 (with K. Costello, et al.).

*The National Regulatory Research Institute,* Consumer Benefits from Gas Choice: Empirical Findings from the First Programs, 2000 (with K. Costello).

*The National Regulatory Research Institute,* Cost Allocation and Rate Design for Unbundled Gas Services, 2000 (with S. Koundiniya).

*The National Regulatory Research Institute,* Pipeline Capacity Turnback: Problems and Options, 1997 (with A. M. Rahman).

*The National Regulatory Research Institute,* Support for Social Goals in A More Competitive Electricity Industry, 1997 (with R. J. Graniere, M. Islam).

*The National Regulatory Research Institute,* State Commission Regulation of Self-Dealing Power Transactions, 1996 (with K. Costello).

*The National Regulatory Research Institute,* Integrated Resource Planning for Local Gas

Distribution Companies: A Critical Review of Regulat01y Policy Issues, 1994 (with M. Islam).

*The National Regulatory Research Institute,* Regulatory Practices and Innovative Generation Technologies: Problems and Rate-making Approaches, 1994 (with K. Costello, et al.)

*The National Regulatory Research Institute,* Regulatory Treatment of Electric Utility Clean Air Act Compliance Strategies, Costs and Emission Allowances, 1993 (with K. Rose, A. S. Taylor).

*The National Regu1atory Research Institute,* Public Utility Commission Implementation of the Clean Air Act's Allowance Trading Program, 1992 (with K. Rose, et al.).

*The National Regulatory Research Institute,* Incentive Regulation for Local Gas Distribution Companies under changing Industry Structure, 1991, (with D. Duann, K. Costello, and S-B. Cho.)

*The National Regulatory Research Institute,* Gas Storage: Strategy, Regulation, and Some Competitive Implications, 1990 (with D. J. Duann, P. A. Nagler and G. Iyyuni).

1. Pennsylvania, Maryland and New Jersey Regional Transmission Operator. [↑](#footnote-ref-2)
2. New York Independent System Operator. [↑](#footnote-ref-3)
3. New England Independent System Operator. [↑](#footnote-ref-4)
4. Electricity Reliability Council of Texas. [↑](#footnote-ref-5)
5. Direct testimony of J. Cas Swiz (filed April 13, 2018) at 31. [↑](#footnote-ref-6)
6. VEDO’s CEP Application (filed April 13, 2018) at 4. [↑](#footnote-ref-7)
7. Direct Testimony of Sarah Vyvoda (filed April 13, 2018) at 3-4. [↑](#footnote-ref-8)
8. *Id*. at 8. [↑](#footnote-ref-9)
9. Staff Report (filed October 1, 2018) (“Staff Report”) at 18 [↑](#footnote-ref-10)
10. VEDO CEP Application (filed April 13, 2018) at 14. [↑](#footnote-ref-11)
11. *See* Staff Report at 18. [↑](#footnote-ref-12)
12. *See id.* [↑](#footnote-ref-13)
13. *See id.* [↑](#footnote-ref-14)
14. VEDO Application at 7-8. [↑](#footnote-ref-15)
15. *Id*. at 8. [↑](#footnote-ref-16)
16. *Id.* [↑](#footnote-ref-17)
17. Staff Report at 18-19. [↑](#footnote-ref-18)