OPC EXHIBIT Exhibit No. 311
Date 9/24/18 Reporter
File No. ER-2018-0145+0146

Exhibit No.:	
Issue(s):	Cost of Service Studies
Witness/Type of Exhibit:	Pavlovic/Rebuttal
Sponsoring Party:	Public Counsel
Case No.:	ER-2018-0145 and ER-2018-0146

REBUTTAL TESTIMONY

OF

KARL RICHARD PAVLOVIC

Submitted on Behalf of
the Office of the Public Counsel

KANSAS CITY POWER & LIGHT COMPANY
and
KCP&L GREATER MISSOURI OPERATIONS COMPANY

Case No. ER-2018-0145 and ER-2018-0146

August 7, 2018

BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF MISSOURI

In the Matter of Kansas City Power & Light Company's Request for Authority to Implement a General Rate Increase for Electric Service	))))	**Case No. ER-2018-0145**
In the Matter of KCP&L Greater Missouri Operations Company's Request for Authority To Implement a General Rate Increase for Electric Service	))))	**Case No. ER-2018-0146**

AFFIDAVIT OF KARL RICHARD PAVLOVIC

STATE OF MARYLAND)
) SS
MONTGOMERY COUNTY)

Karl Richard Pavlovic, of lawful age and being first duly sworn, deposes and states:

1. My name is Karl Richard Pavlovic. I am the managing director of PCMG and Associates, LLC, having its principal place of business at 22 Brookes Ave, Gaithersburg, MD 20877. I have been retained by the Office of the Public Counsel in this proceeding on their behalf.

2. Attached hereto and made a part hereof for all purposes is my rebuttal testimony.

3. I hereby swear and affirm that my statements contained in the attached rebuttal testimony are true and correct to the best of my knowledge and belief.

[signature]
Karl Richard Pavlovic

Subscribed and sworn to me this 6th day of August 2018.

MICHELLE A. LEASE
NOTARY PUBLIC STATE OF MARYLAND
My Commission Expires March 10, 2021

[signature]
Notary Public

MICHELLE A. LEASE NOTARY PUBLIC MONTGOMERY CO. MD

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OF

KARL R. PAVLOVIC

KANSAS CITY POWER AND LIGHT COMPANY

KCP&L GREATER MISSOURI OPERATIONS COMPANY

CASE Nos. ER-2018-0145 and ER-2018-0146

Q. Please state your name and business address.

A. My name is Karl Richard Pavlovic. My business address is 22 Brookes Avenue, Gaithersburg, MD 20877.

Q. Are you the same Karl Richard Pavlovic who submitted direct testimony in these proceedings on July 6, 2018?

A. Yes. Schedule KRP-1 to my direct testimony summarizes my qualifications and experience.

I. PURPOSE OF TESTIMONY

Q. What is the purpose of your rebuttal testimony in these proceedings?

A. I respond to the direct testimonies of KCPL, GMO, and Staff with regard to certain specifics of cost of service studies.

Q. Have you prepared any exhibits in support of your rebuttal testimony?

A. No.

II. SUMMARY OF TESTIMONY AND CONCLUSIONS

Q. WOULD YOU PLEASE SUMMARIZE YOUR TESTIMONY?

A. I explain that:

- KCPL and GMO have not correctly functionalized, classified and allocated AMI meter plant costs;

- the distribution demand allocators used by KCPL and GMO are inaccurate and inconsistent with cost causation;
- the production plant allocation methodology used by KCPL and GMO does not align class allocation with class cost causation;
- correction of these three methodological flaws in KCPL's and GMO's separate cost of service studies would not change my direct testimony finding that the separate cost of service studies result in arbitrary unit cost of service distinctions and arbitrary rate distinctions between similarly situated customers.

My recommendations are that the Commission direct that KCPL and GMO:

- to correctly functionalize, classify and allocate AMI meters in these proceedings;
- to fully deploy AMI meters and use AMI meter demand data to develop accurate distribution demand allocators; and
- to conduct a consolidated cost study before the next rate case and use the results of that consolidated cost study to develop a production plant allocation methodology that aligns class allocation with class cost causation.

III. DISCUSSION

A. KCPL and GMO Cost of Service Studies

Q. HAVE YOU EXAMINED THE CCOS STUDIES KCPL AND GMO FILED IN THESE PROCEEDINGS?

A. Yes. I have examined the CCOS studies using the direct testimonies and applicable schedules of Marisol Miller[1], Thomas J. Sullivan,[2] Bradley D. Lutz,[3] and KCPL and GMO responses to OPC data requests.

Q. WHAT METHODOLOGIES DID KCPL AND GMO EMPLOY IN THEIR CCOS STUDIES?

A. Both CCOS studies employ the standard three-step approach for embedded electric cost studies: (1) the functionalization of costs as production, transmission, distribution, customer or general costs, (2) the classification of the functionalized costs as demand, energy, or customer related, and (3) the allocation of the classified, functionalized costs to customer classes.[4] Both CCOS studies use demand, energy and customer based allocation methodologies.[5] Because both the approach and the specific allocation methodologies employed in the cost studies are identical, I use the term KCPL/GMO in my discussion below.

Q. WHAT DID YOU FIND WHEN YOU EXAMINED KCPL'S AND GMO'S CCOS STUDIES?

A. As I testified in my direct testimony, performing separate cost studies for KCPL and GMO produces arbitrary cost distinctions between similarly situated customers of what is, in fact, a single consolidated utility operation. I also found that (1) AMI meter investment costs are incorrectly (a) recorded in FERC Plant Account 370, (b) functionalized as distribution plant, and (c) classified as customer-related, (2) the allocation methodologies used for secondary

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[1] ER-2018-0145 Miller Direct, pages 11-22 and Schedules MEM-1 and MEM-2; ER-2018-0146 Miller Direct, pages 11-22, Schedules MEM-4 and MEM-5.
[2] ER-2018-0145 Sullivan Direct, pages 5-32 and Schedules TJS-2 through TSJ-10; ER-2018-0146 Sullivan Direct, pages 5-32 and Schedules TJS-2 through TJS-10.
[3] ER-2018-0145 Lutz Direct, pages 3-9; ER-2018-0146 Lutz Direct, pages 3-9.
[4] ER-2018-0145 Miller Direct, pages 14-15; ER-2018-0146 Miller Direct, pages 14-15; see also Electric Utility Cost Allocation Manual, January 1992, National Association of Regulatory Utility Commissioners ("NARUC"), pages 18-23.
[5] ER-2018-0145 Miller Direct, pages 15-19; ER-2018-0146 Miller Direct, pages 15-19; see also Electric Utility Cost Allocation Manual, January 1992, National Association of Regulatory Utility Commissioners ("NARUC"), pages 39-68 (Production), 75-83 (Transmission), 96-101 (Distribution), 102-104 (Customer), and 105-107 (Administrative and General).

and primary distribution facilities are inaccurate, and (3) the Average & Excess allocation methodology used for production costs does not align cost allocation with cost causation.

Q. HOW ARE AMI METERS INCORRECTLY FUNCTIONALIZED BY KCPL/GMO?

A. KCPL/GMO functionalizes AMI meters as distribution plant, recording the cost of the AMI meters in plant account 370.[6] The FERC Uniform System of Accounts ("USoA") for electric utilities, states in pertinent part that Account 370 "shall include the cost installed of meters or devices and appurtenances thereto, for use in measuring the electricity delivered to its users."[7] AMI meters, however, are installed for many more purposes than simply measuring the amount of electricity delivered to customers. In addition to measuring the amount of electricity delivered for billing purposes, AMI meters provide data and information to the utility's (1) outage management system where that data and information are used to identify the location of outages, dispatch crews to that location, and efficiently manage power restoration efforts and (2) energy management system and asset management system where that data and information are used in both system planning and optimizing overall operation of the system. In addition to acquiring data and information used in optimizing operation of the utility's facilities, AMI meters are also able to receive (1) data and information to which customers can respond and optimize their use of the utility's system and (2) control signals to

[6] Responses to OPC Questions 5008 and 5017.

[7] 18 CFR Ch 1, Part 101, Plant Account **370 Meters.** A. This account shall include the cost installed of meters or devices and appurtenances thereto, for use in measuring the electricity delivered to its users, whether actually in service or held in reserve. B. When a meter is permanently retired from service, the installed cost included herein shall be credited to this account. C. The records covering meters shall be so kept that the utility can furnish information as to the number of meters of various capacities in service and in reserve as well as the location of each meter owned. **Items:** 1. Alternating current, watt-hour meters. 2. Current limiting devices. 3. Demand indicators. 4. Demand meters. 5. Direct current watt-hour meters. 6. Graphic demand meters. 7. Installation, labor of (first installation only). 8. Instrument transformers. 9. Maximum demand meters. 10. Meter badges and their attachments. 11. Meter boards and boxes. 12. Meter fittings, connections, and shelves (first set). 13. Meter switches and cut-outs. 14. Prepayment meters. 15. Protective devices. 16. Testing new meters. NOTE A: This account shall not include meters for recording output of a generating station, substation meters, etc. It includes only those meters used to record energy delivered to customers. NOTE B: The cost of removing and resetting meters shall be charged to account 586, Meter Expenses (for Nonmajor utilities, account 556, Meter Expenses).

remotely connect and disconnect customers to and from the system without dispatching a crewed vehicle to a customer location. Because AMI meters perform functions that serve all of KCPL/GMO operation functions (production, transmission, distribution, billing, customer service, and general), AMI meters (as well as the software and communication components of KCPL/GMO's AMI system) should be functionalized, classified and allocated as general plant.

Q. TO WHICH PLANT ACCOUNTS SHOULD AMI METERS AND ASSOCIATED SOFTWARE AND COMMUNICATION COMPONENTS BE RECORDED?

A. Based on the their data acquisition and remote control functions, the AMI meters, software, and communication equipment should be recorded to FERC Accounts 382,[8] 383,[9] and 384,[10] respectively.

Q. WHY SHOULD AMI METERS BE FUNCTIONALIZED AS GENERAL PLANT?

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[8] 18 CFR Ch 1, Part 101, Plant Account 382 Computer Hardware. "This account shall include the cost of computer hardware and miscellaneous information technology equipment to provide scheduling, system control and dispatching, system planning, standards development, market monitoring, and market administration activities. Records shall be maintained identifying to the maximum extent practicable computer hardware owned and used for: (1) Scheduling, system control and dispatching, (2) system planning and standards development, and (3) market monitoring and market administration activities. **Items** 1. Personal computers 2. Servers, 3. Workstations, 4. Energy Management System (EMS) hardware, 5. Supervisory Control and Data Acquisition (SCADA) system hardware, 6. Peripheral equipment, 7. Networking components."

[9] 18 CFR Ch 1, Part 101, Plant Account 383 Computer Software. "This account shall include the cost of off-the-shelf and in-house developed software purchased and used to provide scheduling, system control and dispatching, system planning, standards development, market monitoring, and market administration activities. Records shall be maintained identifying to the maximum extent practicable the cost of software used for: (1) Scheduling, system control and dispatching, (2) System planning and standards development, and (3) Market monitoring and market administration activities. **Items** 1. Software licenses, 2. User interface software, 3. Modeling software, 4. Database software, 5. Tracking and monitoring software, 6. Energy Management System (EMS) software, 7. Supervisory Control and Data Acquisition (SCADA) system software, 8. Evaluation and assessment system software, 9. Operating, planning and transaction scheduling software, 10. Reliability applications, 11. Market application software."

[10] 18 CFR Ch 1, Part 101, Plant Account 384 Communication Equipment. "This account shall include the cost of communication equipment owned and used to acquire or share data and information used to control and dispatch the system. **Items** 1. Fiber optic cable, 2. Remote terminal units, 3. Microwave towers, 4. Global Positioning System (GPS) equipment, 5. Servers, 6. Workstations, 7. Telephones."

A. AMI meters should be functionalized as general plant, because, as I explained above, they support the scheduling, control and dispatching, and planning of the production, transmission, and distribution plant necessary to provide electric service.[11]

Q. ONCE FUNCTIONALIZED AS GENERAL PLANT, HOW SHOULD AMI METERS BE CLASSIFIED AND ALLOCATED?

A. There are three accepted methods of classification and allocation of general plant,[12] two of which are in common use; (1) production/transmission/distribution (PTD) plant ratios and (2) labor ratios. KCPL and GMO use PTD ratios,[13] and that is what I recommend for allocation of AMI meters.

Q. WHAT IS THE IMPACT OF THIS INCORRECT FUNCTIONALIZATION OF AMI METERS?

A. Because KCPL/GMO functionalizes the AMI meters as distribution plant classified as customer-related, AMI meters are allocated to customer classes based on the number of customers in the class. The result is that customer classes with relatively large numbers of customers are over allocated AMI meter costs and customer classes with relatively small numbers of customers are under allocated AMI meter costs.

Q. IS THIS A POLICY QUESTION?

A. No, it is a question under the principle of cost causation. The cost of a meter, the sole function of which is to measure the amount of electricity delivered to the customer for billing purposes, is caused by that customer's being connected to the KCPL/GMO system for service. The cost of an AMI meter is caused by KCPL/GMO's regulatory obligation to operate its system so as to maximize efficiency and minimize cost (the principle of least cost consistent with providing

[11] 18 CFR Ch 1, Part 101, Plant Account 382 Computer Hardware; see also NARUC Manual, page 105.
[12] NARUC Manual, page 105.
[13] Responses to OPC Questions 5002S (Attachment Q5002s_GMO Avg-Excess 4CP 01-02-18 WN PRO.xlsm, Cost of Service tab, Schd. 3 2030-2380 and Schd. 21 1560) and 5012S (Attachment Q5012s_KCPL Missouri CCOS 01-02-18 Avg-Excess 4CP WN PRO.xlsm, Cost of Service tab, Schd. 3 2070-2190 and Schd. 21 1570).

a utility a reasonable return). If the AMI meters cannot be shown to maximize efficiency and minimize cost, then the costs of the meters should be excluded from KCPL/GMO's cost studies. If the costs can be shown to maximize efficiency and minimize cost, then the costs should be functionalized, classified, and allocated as general plant.[14]

Q. WHY ARE THE SECONDARY AND PRIMARY ALLOCATION METHODOLOGIES OF KCPL/GMO INACCURATE?

A. The primary and secondary allocation methodologies are inaccurate because they use non-coincident peak measures of demand diversity to allocate primary and secondary distribution plant to customer classes.[15] Non-coincident peak demand allocators are proxy measures that have been traditionally used to estimate the class demand diversity at the various voltage levels of the distribution system.[16] Such measures are inaccurate for two reasons: (1) they are based on only a sample of individual customer demands and (2) non-coincident peak demand allocators do not measure diversified class demand at local area load centers at various voltage levels.

Q. WHY ARE THE MEASUREMENTS BASED ON ONLY A SAMPLE OF INDIVIDUAL CUSTOMER DEMANDS?

A. Primarily, because until recently, it has been prohibitively expensive to place a demand measuring meter at each customer's location for the larger classes. Instead, electric utilities developed load research programs using research demand meters placed on small random samples drawn from rate-defined customer classes. Both KCPL and GMO have such load research programs.[17]

Q. HOW CAN THESE MEAUREMENTS BE MADE MORE ACCURATE?

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[14] NARUC Manual, page 105.
[15] ER-2018-0145 Miller Direct, page 16, lines 1-7; ER-2018-0146 Miller Direct, pages 16, lines 1-7.
[16] NARUC Manual, page 97.
[17] Responses to OPC Questions 5005 and 5015.

A. By having demand measuring meters at each customer's location, which the on-going deployment of AMI meters on the KCPL/GMO system makes possible.

Q. WHY ARE NON-COINCIDENT CLASS DEMANDS INACCURATE?

A. As the NARUC Manual explains "the distribution engineer ensures that sufficient conductor and transformer capacity is available to meet the customer's loads at the primary- and secondary-distribution service levels" and "[l]ocal area loads are the major factors in sizing distribution equipment."[18] The demand that the engineer uses to size a local area load center is the sum of the individual customers demand at the time of peak demand on the load center, which is referred to as coincident peak demand. Non-coincident peak demand at a load center is the sum of the maximum demand of each customer at whatever time that demand occurs. While non-coincident peak demand is traditionally used as a class cost allocator, it is never used to size the capacity of a local area load center, because to do so would produce more capacity (and cost) than necessary to serve the customers on that load center.

Q. HOW CAN THE MEAUREMENT OF CLASS COINCIDENT DEMAND AT LOCAL AREA LOAD CENTERS BE MADE MORE ACCURATE?

A. Through the deployment of AMI meters. With AMI meters the coincident demand of all the customers of a given class at a given local area load center can be accurately measured and used to calculate accurate class allocators based on cost causation.

Q. WHAT IS THE IMPACT OF THE USE OF NON-COINCIDENT PEAK DEMAND ALLOCATORS?

A. The impact on any given utility system is an empirical question that depends on the configuration of the system's local area load centers and the aggregation of given class' coincident peak demand at the local area load centers of the system. As a general matter, classes whose peak demand does not coincide with the peak demand on a given local area

[18] NARUC Manual, page 97.

load center will be over allocated local area load center costs, while classes that peak at or closer to load center's peak will be under allocated costs.

Q. IS THIS A POLICY QUESTION?

A. No, as with AMI meters, it is a question under the principle of cost causation. Coincident peak demand causes distribution local area load center distribution costs. The only question is how best to accurately measure class coincident demand at local area load centers.

Q. DOES THE AVERAGE & EXCESS ALLOCATION METHODOLOGY USED FOR PRODUCTION COSTS ALIGN COST ALLOCATION WITH COST CAUSATION?

A. No.

Q. WHY NOT?

A. The Average & Excess methodology[19] rests on the assumption that a utility's generation resources respond to the utility's native load and seeks to allocate production plant so as to align the cost characteristics of production plant with each class' specific load characteristics. This is true for all the various production plant allocation methodologies detailed in the NARUC Manual,[20] and specifically for the six methodologies KCPL/GMO evaluates for use in these proceedings.[21] KCPL/GMO's dispatchable production plant does not, however, respond to KCPL/GMO's native load. Rather, KCPL/GMO's production plant responds to KCPL/GMO's reserve margin as determined by SPP and the load characteristics of the aggregate load served by SPP's energy markets.

[19] NARUC Manual, pages 49-52.
[20] NARUC Manual, pages 39-68.
[21] ER-2018-0145 Sullivan Direct, pages 17-18 and 26-29 and Schedule TJS-10; ER-2018-0146 Sullivan Direct, pages 17-18 and 26-29 and Schedule TJS-10.

Q. WHY DO YOU SAY THAT KCPL/GMO'S PRODUCTION PLANT RESPONDS TO THE LOAD CHARACTERISTICS OF THE AGGREGATE LOAD SERVED BY SPP'S ENERGY MARKET?

A. Because KCPL/GMO operate their generating resources from a single central control center,[22] submit generation offers in SPP's day-ahead and real-time markets, and respond to SPP operating instructions for their dispatchable production resources.[23] By participating in the SPP RTO energy markets, KCPL/GMO's production plant costs are a capped function of their SPP determined reserve margin, their fuel and O&M expenses are determined by operating instructions from SPP, and their recovery of fuel and O&M expenses is a function of the revenues they receive from the SPP energy markets. There is a fundamental disconnect between the plant cost, and fuel and O&M expense characteristics of KCPL/GMO's production plant, and the load characteristics of KCPL/GMO's rate-defined customer classes. This disconnect is further exacerbated by the fact that KCPL/GMO evaluates the production plant allocation methodologies in separate cost studies for KCPL and GMO generating resources and customer classes rather than a consolidated KCPL/GMO cost study, as I pointed out in my direct testimony.

Q. HOW HAVE OTHER JURISDICTIONS WITH UTILITIES PARTICIPATING IN RTOS DEALT WITH THIS DISCONNECT?

A. In those jurisdictions that have restructured to provide customers with access to competitive energy suppliers, utilities are required to either divest their generation resources or transfer ownership and operation of those resources to unregulated subsidiaries. In those jurisdictions that have not restructured with which I am familiar, the disconnect has been simply ignored to date.

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[22] Responses to OPC Questions 5010 a. – e. and 5019 a.-e.
[23] Responses to OPC Questions 5010 f. and 5019 f.

Q. DO YOU HAVE A RECOMMENDATION AS TO HOW KCPL/GMO SHOULD DEVELOP A PRODUCTION PLANT ALLOCATION METHODOLOGY THAT ALIGNS CLASS ALLOCATION WITH COST-CAUSATION?

A. Yes. As I recommended in my direct testimony, KCPL/GMO should reflect the fact of consolidated operation of its generating resources in a single cost study. That consolidated cost study should then form the basis for development of a production plant cost allocation methodology that aligns class cost allocation with class cost causation.

Q. IS THIS A POLICY QUESTION?

A. No, as with AMI meters and distribution demand allocators, it is a question under the principle of cost causation.

Q. WOULD CORRECTING THESE METHODOLOGICAL FLAWS IN KCPL'S AND GMO'S SEPARATE COST OF SERVICE STUDIES CHANGE YOUR DIRECT TESTIMONY CONCLUSIONS THAT THE SEPARATE KCPL AND GMO STUDIES RESULT IN ARBITRARY UNIT COST OF SERVICE DISTINCTIONS AND ARBITRARY RATE DISTINCTIONS BETWEEN SIMILARLY SITUATED CUSTOMERS?

A. No.

Q. ARE YOU RECOMMENDING THAT THESE METHODOLOGICAL FLAWS BE ADDRESSED IN THE PRESENT PROCEEDINGS?

A. The erroneous functionalization, classification and allocation of AMI meter plant costs could easily be corrected in the current proceedings. The identified problems with the distribution demand allocators and the production plant allocation methodology, however, cannot as a practical matter be addressed in these proceedings. The identified problems in the distribution demand allocators require that AMI meters be fully deployed to KCPL and GMO customers and providing the required customer demand data. KCPL and GMO state that AMI meters are not yet fully deployed to their customers.[24] It is my understanding that full deployment is not expected to be achieved until 2020. Similarly, the identified problems with the production plant allocation methodology can only be addressed in conjunction with a consolidated KCPL/GMO cost study that I recommend be conducted before the next rate case.

B. Staff Cost of Service Study

Q. HAVE YOU EXAMINED STAFF'S CLASS COST OF SERVICE STUDY FILED IN THESE PROCEEDINGS?

A. Yes. I have examined Staff's Class Cost of Service study using the direct testimony of Natelle Dietrich and Staff's CCOS Report.[25] It should be noted that Staff performed a cost of service study for KCPL only,[26] and that the only significant methodological difference between Staff's cost of service study and those of KCPL and GMO is the production cost allocation methodology.[27]

Q. WHAT DID YOU FIND WHEN YOU EXAMINED STAFF'S COST OF SERVICE STUDY?

A. With regard to production cost allocation methodology, Staff uses a version of the Base-Intermediate-Peak (BIP) Method which Staff denominates DBIP.[28] As with KCPL/GMO's Average & Excess method, the BIP methodology rests on the assumption that a utility's generation resources respond to the utility's native load and seeks to allocate production plant so as to align the cost characteristics of production plant with each class' specific load characteristics. As I explained above, KCPL/GMO generation resources actually respond to

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[24] Responses to OPC Questions GMO 5023 and KCP&L 5022.
[25] ER-2018-0145 and ER-2018-0146: Dietrich Direct, pages 1-2 and 4-5 and Missouri Public Service Commission Staff Report Class Cost of Service.
[26] ER-2018-0145 and ER-2018-0146: Dietrich Direct, page 4, lines 11-16.
[27] ER-2018-0145 and ER-2018-0146: Staff CCOS Report, pages 8-16.
[28] ER-2018-0145 and ER-2018-0146: Staff CCOS Report, pages 8-16; see also NARUC Manual, pages 60-62.

the aggregate load served by the SPP energy markets. As a consequence, the BIP method also fails to align class allocation with class cost causation.

With regard to distribution demand allocators, Staff uses class non-coincident peak allocators measured at the primary and secondary voltage levels.[29] Consequently, as I explained above, Staff's distribution demand allocators are inaccurate for the same reasons that KCPL/GMO's distribution demand allocators are inaccurate.

With regard to AMI meters, Staff used KCPL's meter investment per class.[30] Consequently, Staff's cost of service study functionalizes, classifies, and allocates AMI meters incorrectly, as I explained above.

Q. ARE THERE METHODOLICAL CONSIDERATIONS THAT FAVOR KCPL/GMO'S AVERAGE & EXCESS PRODUCTION ALLOCATION METHODOLOGY OVER STAFF'S BASE-INTERMEDIATE-PEAK METHODOLGY OR VICE VERSA?

A. Yes. Staff's Base-Intermediate-Peak methodology better aligns the cost characteristics of generating resources with class specific load characteristics.

Q. DOES THIS CONCLUDE YOUR REBUTTAL TESTIMONY?

A. Yes.

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[29] ER-2018-0145 and ER-2018-0146: Staff CCOS Report, page 19, lines 10-11 and 30-31.
[30] ER-2018-0145 and ER-2018-0146: Staff CCOS Report, page 20, lines 4-7.